Land/Rural Issues

1.0 Introduction

1.0.1 This paper examines the land and rural issues that are evident within Southland. These issues experience in some cases attention at the national level. Others are specific to the region.

1.0.2 Soil and water form the basis of the land resource of Southland. The interaction between rock and the various soil-producing processes produces a range of soils, mineral resources and other natural features which are of high value to people and provide habitats for plants and animals and other living organisms. Water is a vital aspect of the natural resources of the land. All living things require a reliable supply of water and high quality water is required to support natural ecosystems and human health and recreation.

1.0.3 Exploitation, inappropriate use and poor management can all contribute to the degradation of water and soil resources. Conversely, appropriate use and good management can conserve the land, and it is this sustainability that the Resource Management Act (1991) seeks to achieve.

1.0.4 Land use patterns within Southland have rarely been static, with changes driven by overseas market conditions. Recently, changes in the farm gate price of milk have led to widespread conversion from pastoral farming to dairying. Such growth brings challenges such as adverse effects on water quality and increased pressure on the soil resource.

1.1 The Legislative Context

1.1.1 *The Resource Management Act*

1.1.1.1 The purpose of the Resource Management Act 1991 is to promote the sustainable management of natural and physical resources. Sustainable management includes managing the use, development and protection of natural and physical resources to enable people and communities to provide for their social, economic and cultural well being and their health and safety.

1.1.1.2 Section 5 is intended to be enabling, so that people and communities can manage resources in a way or a rate that provides for their economic well being, while achieving other things: sustaining the potential of resources to meet the needs of future generations, safeguarding the life-supporting capacity of air, water, soil and ecosystems, and addressing adverse effects on the environment. Section 5(2)(c) requires that development avoids, remedies or mitigates adverse effects on the environment.

1.1.1.3 Section 6 lists matters of national importance that are to be recognised and

provided for in achieving section 5. Section 6 requires the protection and preservation of the natural character of the coastal environment, outstanding natural features and landscapes, significant indigenous vegetation and fauna, and tangata whenua values.

1.1.1.4 Section 7 includes additional matters that particular regard must be given to, including the efficient use and development of natural and physical resources; the maintenance and enhancement of amenity values; maintenance and enhancement of the quality of the environment and the intrinsic values of ecosystems.

1.1.2 *Council Responsibilities*

1.1.2.1 Regional councils are responsible for controlling the taking, use, damming, and diversion of water, and controlling the quantity, level and flow of water in any water body including wetlands (section 30, RMA).

1.1.2.2 Territorial authorities are responsible for controlling the actual or potential effects of the use of land (section 31 RMA). `Use' includes the destruction of, damage to, or disturbance of, the habitats of plants or animals, in, on, or under land (section 9, RMA). This enables territorial authorities to control the removal of indigenous vegetation within wetland areas.

1.1.2.3 The Regional Water Plan for Southland provides a robust and innovative framework for management of activities in or near water bodies. The Plan enjoys public support and has been designed in a way that allows adjustment over time to keep up with changes in resource pressures and knowledge of effects that are expected to occur, effects of climate change for example. This plan includes rules on activities in riparian or near stream areas that have potential to affect water quality, such as stock access, discharges from crossing points and activities that result in bed disturbance.

1.1.2.4 The Effluent Land Application Plan and Solid Waste Plan are being reviewed. These Plans deal with discharges to land. The review processes known as the Discharge Plan Project will combine with the Water Plan to create a single document covering all discharges.

1.1.2.5 This plan will address a number of activities that have effects on the soil and water resources of Southland, these include:

- controls on activities related to accumulation, storage and discharge of agricultural effluents, such as construction and use of structures used to store agricultural waste and the application of agricultural waste to land in circumstances where it may enter water;
- making and storing silage and the effects of leachate produced;
- the effects of runoff or effluent disposal associated with farm lanes and infrastructure;
- runoff or infiltration of contaminants from feed pads and standoff pads;

- runoff of contaminants and infiltration of nitrates that result from intensive winter grazing;
- the effects of improper disposal of inorganic wastes;
- the effects of onsite wastewater disposal systems (septic tanks);

1.1.2.6 The Southland District Plan is intended to control the way land is used. This plan notes that the purpose of the Rural Resource Area is to provide a flexible framework that allows rural activities to continue while ensuring that they do not adversely affect the physical and natural resources upon which they rely. The existing District Plan could be viewed as having adopted a predominantly non-regulatory approach to rural landuse in the Southland District with landuses that utilise the soil resource being permitted activities.

1.1.3 ***Regulation in other documents***

1.1.3.1 The Park Management Plans for Fiordland and Stewart Island National Parks include restrictions on access to sensitive areas (Murchison Mountains and Aurora Caves), restrictions on overflying or landings in designated wilderness areas and restrictions on numbers of concessions and sizes of parties in 'remote settings'.

1.1.4 ***New Zealand Wetland Framework***

1.1.4.1 New Zealand has not enacted a specific legislation for the implementation of the Ramsar Convention because existing legislation was considered adequate. This legislation includes:

- the Conservation Act 1987
- the Resource Management Act 1991
- the Reserves Act 1977
- the National Parks Act 1980

1.1.4.2 The Conservation Act provides for the Department of Conservation to manage for conservation purposes, land and other natural and historic resources held under that Act, the Reserves Act and the National Parks Act. It also has a role to advocate for conservation of important ecosystems, such as wetlands.

1.1.4.3 As part of the implementation of Ramsar, central government released the New Zealand Wetland Management Policy in 1986, which set out broad objectives for wetland management (Commission for the Environment, 1986). This policy states that *`because past and current development and modification of wetlands has greatly reduced their former extent, emphasis in wetland management has to be given to preservation, with development only when there is an overwhelming balance in its favour'*.

1.2 **The Southland District Council Perspective**

1.2.1 Section 1.2 'The Land' of the existing District Plan notes that placed in a national context, Southland has the largest land area involved in agricultural production in

New Zealand and is therefore a major contributor to New Zealand's total agricultural production. This section of the existing Plan notes that approximately 18% of New Zealand's pastoral products and some 9% of New Zealand's Gross National Product in 2001 came from Southland. This highlights the significance of land in the rural economy at this time and the Southland District today is still a very significant contributor to New Zealand's total agricultural production.

1.2.2 Resource management issues relating to rural landuse will be a key consideration for the second generation Southland District Plan. Since the existing District Plan was formulated in the 1990's a significant amount of landuse change has occurred in the Rural Resource Areas of the Southland District; either from one form of farming to another or via residential development . The implications of these changes will need to be addressed in framing rural and land issues in the second generation District Plan. There have also been a number of national level policy changes that are of direct relevance to rural land issues. The new provisions of the RMA relating to climate change, landscapes and biodiversity are three examples of policy changes that need to be addressed.

1.3 The natural resources of the Region- Soils, Lakes, Rivers and Wetlands

1.3.1 *Soils*

1.3.1.1 Soils are a significant natural resource of the Region, and the Resource Management Act requires that the resource be managed in a sustainable manner. Under the provisions of the Act it is necessary to consider this issue and others in terms of the "life supporting capacity" of the soil resource and the "needs of future generations".

1.1.3.2 Soils are the medium in which plants grow, and are an integral and living part of the ecosystem. They are also a finite resource and only replenished slowly over time. The productive capacity of the soil should be protected and managed responsibly so as to sustain and ensure the livelihoods of future generations.

1.1.3.3 Versatile soils are capable of being used intensively to produce a wide variety of plants without adverse effects on soil quality; approximately 95000 hectares of Southland is covered by soils that are classified as versatile or high producing. Other soils are fragile, and extra care is required in the way that they are used. All soils, however, can be damaged, and all soils have limitations, regardless of whether they are versatile or fragile.

1.1.3.4 In rural areas activities such as cultivation, winter grazing, construction activities and the discharge of effluents result in risks to the soil resource as the soil structure is damaged or contaminants accumulate. These activities may also result in erosion during wind or rainfall events.

1.1.3.5 It is possible to overcome soil limitations by thorough land use practices such as providing organic matter, shelter, drainage, irrigation or by managing fertility. Soil retention and ground stability can be aided by the retention, or planting, of

particular types of vegetation.

1.1.3.6 There are also a number of factors which do not physically impact on the soil resource but affect people's ability to utilise that resource, for example, subdivisional controls, lending criteria of banks, proliferation of pest plants and animals and prices for stock or crops.

1.3.2 ***Lakes and Rivers***

1.3.2.1 The lakes and rivers of Southland are dominant features of the Region's environment and contribute to its natural, scenic, recreational and amenity values. Physically the main rivers of Southland (Mataura, Oreti, Aparima and Waiau) have created the fertile plains that dominate the Region. The Mataura/Waikaia River, their tributaries upstream of Gore, and the Mimihau and Mokoreta Rivers are recognised as watercourses of outstanding natural value. They provide habitat to many native species and are an internationally recognised trout fishery.

1.3.2.2 The large lakes of the Region are nationally significant. Lakes Te Anau, Manapouri, Monowai, North and South Mavora, Hauroko, Poteriteri, McKerrow and Gunn are highly valued for their water quality, recreational, landscape and remoteness values.

1.3.2.3 Maori have a strong spiritual and cultural relationship with lakes and rivers. Maori are reliant on these as a source of native fish species, in particular freshwater eels, and other fauna. The lakes, and rivers of Southland continue to play a major part in Maori values, and the social, economic and cultural well-being of the people and communities of Southland.

1.3.2.4 The lakes and rivers of Southland are affected by activities carried out within or near them. Non-point source pollution, discharge of industrial waste, discharge from on-site wastewater systems and runoff from urban areas all have effects on water quality. Water extraction for the purpose of irrigation, human consumption or hydro-electric power generation and the alteration of ecological flows and water levels that results has become a regionally significant issue in recent years. The Lower Waiau has been severely modified by hydro-electric development.

1.3.2.5 Over the past decade, pressures on the natural values of Southland waterways has continued to increase. Monitoring indicates that water quality continues to decline across all major catchments and water extraction for irrigation has become a significant activity for the first time. As the increasing value of the natural resources of the region drives economic growth, careful management will be required to sustain the values of lakes and rivers for future generations.

1.3.3 ***Wetlands***

1.3.3.1 A wetland is a place where the ground is permanently or periodically wet and which supports a natural ecosystem of plants and animals that are adapted to wet conditions. Wetlands are dynamic ecosystems which undergo constant change

naturally – they are very sensitive to changes in climate, water availability, disturbance and land use. They can be either permanently or seasonally wet. The conditions in a wetland can also vary over time, with changes daily, seasonally over a longer time period as wetlands evolve and fill with sediment to eventually become dry land.

1.3.3.2 Before human settlement of New Zealand (c 1250), wetlands covered about 670,000 hectares of New Zealand. This had been reduced to about 89,000 hectares, representing a loss of some 87% nationally. Southland is the most fortunate region nationally retaining some 35% of its wetlands.

1.3.3.3 Wetlands fulfil a number of roles:

- wetlands protect coastal areas and stabilise shorelines by slowing runoff and trapping soil in the fibrous roots of the plants. They also protect coastal areas from damage from storm surges and high winds;

- wetlands support a high biodiversity because wetland habitats are often complex with different zones and different conditions;

- wetlands are important recreational areas, enjoyed by many naturalists, fishermen, whitebaiters, waterfowl hunters and those engaged in other water sports;

- wetlands act as sponges reducing the amount and extent of flooding by absorbing and ponding excess water caused by rain and providing a steady flow of water during droughts;

- wetlands filter pollutants and sediments and so provide environmental and health benefits in cleaning up contaminated water;

- wetlands are a cultural resource, being important for early Maori as a source of food (fish, birds, eels, pollen and roots) and plants such as flax for weaving and thatching, and moss for bedding;

- wetlands provide research opportunities. They show what large parts of Southland and New Zealand used to be like and are excellent examples of the functioning of ecosystems and are valuable for the study of biology.

1.3.3.4 It is natural for wetland areas to change slowly over time in response to phenomena such as changes in water levels, accumulation of sediments, vegetative succession and fire. Since the time of human settlement, the rate of change has accelerated as wetland areas are converted to farmland and exotic species invade wetlands. Activities that can damage wetlands include:

- conversion to agriculture has been the greatest cause of the loss of wetlands.

Agriculture, horticulture or forestry have all been developed from wetland areas, and areas of wetlands on farms are still being converted;

- weed invasion with gorse being a particular problem in all wetland areas, although it is less of an issue where the water table is maintained at a natural level;

- uncontrolled public access, either for private recreation or commercial tourism, can damage wetlands. Of particular concern is the driving of motor vehicles and motorbikes through wetland areas;

- climate change may result in sea level rise. If that occurs, low lying wetlands will slowly drown unless they can retreat inland, keeping pace with the rate of sea level rise;

- lack of knowledge contributes towards a lack of respect as to the importance of wetlands. Local authorities and government agencies in Southland in recent years have sought to increase public awareness of the importance of wetlands and the risks they face;

- lack of statutory protection is a major risk to wetlands, for without formal protection there is no guarantee that the wetlands will not be drained or managed inappropriately.

2.0 Relevance of Existing Issues

2.0.1 The purpose of this section is to assess the relevance of the issues, options, policies and methods framework in the existing Regional Policy Statement and Southland District Plan.

2.1 The Relevance of Regional Policy Statement Issues

2.1.1 The current Regional Policy Statement identifies a range of issues that concern the land resource. Issues from Chapter 6- Lakes, Rivers and Wetlands and Chapter 8- Soils have been analysed to determine their relevance in the current context. The goal of this analysis was to examine the relevance of the issues in the current context. The full analysis can be found in **Appendix 1: Step 2** - *Analysis of the relevance of existing issues and associated objectives, policies and methods in the current Regional Policy Statement.*

2.1.2 *Chapter 6. Lakes, Rivers and Wetlands*

2.1.2.1 Chapter 6 contains 14 issues that concern aspects of the land resource related to water:

(a) lack of protection and understanding of the intrinsic values of water bodies and wetlands remains an issue of concern in the Southland region. The

intrinsic values of water bodies includes the mauri (spiritual essence or life force) of water, ecological health, and the ability to support human activities such as recreation, and extraction to maintain human health and support economic activities. [1] These aspects have not changed significantly over the past decade, and the majority of objectives, policies and methods remain relevant in the modern context;

(b) loss of habitat for wildlife and freshwater fish is still a relevant issue for Southland resource management. Lakes, rivers and wetlands support a variety of habitat values. These values are under increasing pressure from a range of land use and development activities and some existing policies require amendment to reflect this change;

(c) loss of significant wetlands remains a relevant issue. Environment Southland and Department of Conservation staff continue to report incidents of drainage, degradation, de-vegetation or loss of significant areas of wetlands on private lands, although the majority of existing objectives, policy and methods remain relevant. There is a need for a coherent alignment of knowledge, policy and action to preserve what remains of wetlands;

(d) the issue of wetlands as a site of food gathering is more of a statement of fact than an issue. This issue might be more relevant if it explicitly identified linkages between activities that threaten ecological values of wetlands and value of these areas for recreational purposes or food or flax gathering. Objectives, policies and methods that are linked to this issue remain relevant;

(e) the inherent difficulty in balancing the needs and interactions of the many parts of the complex system that is the water resource remains a relevant issue. There are a variety of human activities that have effects on the water resource and there are complex interactions that are difficult to measure or predict. Although a Regional Water Plan has been developed to manage the hydrological system, the existing objectives, policies and methods remain relevant as this plan will be renewed over time;

(f) changes to ecological flows and water levels remain a relevant issue. Even though this issue is comprehensively addressed through the Proposed Regional Water Plan, the issue remains relevant as this plan will be reviewed over time. The existing objectives, policies and methods appear adequate to address this issue;

(g) it would be appropriate to combine The sustainability of the gravel resource and the effects of gravel extraction into a single issue as the effects associated with these two issues are very similar. Some amendments are also necessary to existing objectives, policies and methods. It is suggested that the focus of action be on preventing effects, as the adverse effects of gravel extraction can

[1] See The Proposed Regional Water Plan for Southland (2008) Water Issues p1.

be very difficult to amend once they occur. There is also scope for some policy direction for region-wide coordination of gravel extraction activities;

(h) the issue of the effects of agricultural runoff and inappropriate riparian management on water quality, in wetlands and estuaries remains relevant. Activities in riparian areas[2] have increased in prominence, with 'non-point source pollution' from agriculture identified as a key driver of the region-wide decline in water quality experienced over recent years.[3] Although relevant, this issue and associated objective, policies and methods may require amendment to reflect the importance of 'near stream areas' as well as riparian zones as a factor in the transfer of contaminants to water bodies;

(i) vegetation clearance and landscape modification continue to have effects on loadings of sediments and other contaminants in rivers and remains relevant in the current context. This issue and associated objectives, policies and methods require amendment to reflect the fact that vegetation clearance has a range of adverse effects beyond the discharge of contaminants to waterways.

(j) lack of access to, along, and across some lakes, rivers and wetlands remains a relevant issue as do the associated objectives, policies and methods. Access across farmland and access to natural or high country areas, has also become an issue of regional importance over recent years and goes beyond access to waterway margins. In view of these changes, access is further developed as an emerging issue in Part 3.

(k) the social, cultural and ecological effects of hydro-electric power generation remain relevant a resource issue for Southland as rivers within the Region have some hydro-electric development potential. Consideration of any future development of the rivers of the Region for hydro-electric purposes will need to have regard to the intrinsic values of those rivers, and the effects such development will have. The existing objectives, policies and methods remain relevant in the current context.

(l) the need to recognise, and make provision for the maintenance of, flood alleviation and river management works, community drains, and other infrastructural assets remains relevant in the contemporary context. The built environment and rural areas often include river management works and community drains. These works require ongoing maintenance and

2 Riparian areas are areas in close proximity to waterway boundaries. Activities in these areas are highly likely to have some effect on the ecology or health of the associated water body. Riparian activities that can improve stream health include excluding stock and maintaining vegetative filter zones. For more information on riparian management see: Ministry of Agriculture and Forestry (2004) Review of Riparian Zone Effectiveness. MAF Technical Paper No: 2004/05 Prepared for MAF Policy by Stephanie Parkyn NIWA

3 Southland Regional Council (2008) Proposed Regional Water Plan for Southland.

monitoring if they are to be effective. There is a lack of support for this issue in any objective, although there are a range of policies and methods that remain relevant and applicable. The currently cross-referenced objective refers to the *'adverse effects of activities in, on, under, adjacent to or over the beds of lakes, rivers and wetlands.'* While valid, this objective is not consistent or relevant with this Issue.

(m) the unsustainable harvesting of sphagnum moss is not seen as relevant as there is no sphagnum moss industry in Southland.

2.1.2.2 The following is a tabular summary of the analysis that was done:

Table 1: Wetlands, Lakes and Rivers			
Issue	**Relevant?**	**Objective**	**Policy**
1	Y	4.1, 5.1, 6.1, 6.2, 6.4	4.1, 4.8, 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**, **6.14**
2	Y	6.1, 6.2, 6.4, 13.7	4.4, **6.1**, 6.4, 6.6, **6.8**, **6.9**, 6.10, 6.12, **6.14**
3	Y	6.1	**6.1**, 6.2, 6.3, 6.6, **6.7**, **6.8**
4	**Y**	1.2, 4.1, 5.1, 6.1, 6.2, 6.3	1.2, **6.1**, 6.4
5	Y	6.1**,** 6.2, 6.3, 6.4	5.1, 6.1, **6.3**, 6.4, 6.5, 6.6, 6.7
6	Y	**4.2**, 6.1	**4.1**, 6.6, 6.10, 6.11, **6.12**
7	Y	**6.4**	**6.12**
8	**Y**	6.1, 6.4	6.5, 6.6, **6.7**, 6.10, **6.12**, **11.10**
9	**Y**	6.4, 8.2	6.2, 6.4, 6.6, 6.7
10	Y	5.2, 6.1, 6.4, 8.2	6.3, 6.6, 6.7, 6.11
11	Y	6.1, 6.2, 6.3	6.5
12	Y	6.4	6.10, 14.5, 14.9
13	Y	**6.4**	6.5, 6.6, **6.9, 6.10**, 10.4, 15.9, 15.10, **15.12**
14	**N**	6.1, 6.2	6.4

Key

Underlined	**The central objective or policy for this issue**
Black	Relevant
Blue	**Suggest modification to become more relevant**
Red	**No longer relevant**
Green	**Not linked in RPS, but found to be relevant**

2.1.3 ***Chapter 8. Soils***

2.1.3.1 Chapter 8 contains 11 issues that concern aspects of the land resource related to soils.

2.1.3.2 (a) the long term sustainable management of versatile soils remains a relevant issue in Southland. Versatile soils may be lost through inappropriate land management, contamination or residential developments. The existing objectives, policy and methods remain relevant and useful in the current

context.

2.1.3.3 *Policy 8.2 Provide for the sustainable management of the most versatile soils of the Region* is cross-referenced by several issues. Apart from the issue of loss of soil to production from peri-urban expansion a special emphasis on versatile soils is not supported by either the RMA or by community members. Policy 8.2 is referenced by inorganic waste, degradation or loss of soils, sustainable land use practices and riparian and near stream areas.

(a) the discharge of inorganic wastes remain a relevant issue. The three aspects of the issue are discharges of agrichemicals, sites of past activity or contaminated sites and 'emerging contaminants' that we are not aware of, but could cause problems in future. The analysis of this issue identified a number of additional objectives and policies that were found to be relevant, including effects associated with incorrect storage or transportation of waste, runoff from transport networks, discharges in riparian and near stream areas and the effects of inorganic wastes on sites of cultural significance;

(b) degradation and loss of soils continues to occur throughout the region. A range of land use activities can result in degradation or loss of soils. Some soils may be inherently vulnerable or fragile and require special measures to avoid adverse effects. The existing objectives, policies and methods remain relevant in the current context. References to versatile soils should be removed as the focus of concern with degradation or loss of soils is on poor soils where the effects of mis-management are more severe.

(c) the incorrect disposal of agricultural wastes to land and adverse effects on the soil resource remains relevant. Current Regional Council policy is to require the accumulation of organic waste as it allows controlled discharge of contaminants and minimal effects on the values of waterways. This issue and the associated objectives, policies and methods require amendment to reflect the widespread practice of disposal of organic wastes to land. Specifically, they must give regard to the fact that it is no longer acceptable to consider the effects of discharges of waste to land without also considering the potential for transport of these contaminants to waterways.

(d) research on sustainable land use practices remains a relevant issue in the current context. Although a variety of scientific work has been done on sustainable land use practices since the drafting of the current RPS, the sharing of this information and uptake of practices by farmers has been limited. It is suggested that the wording of the issue and associated objectives policies and methods be altered to allow for extension and sharing of information as well as research.

(e) the linkage between land use and water quality remains a relevant issue in that it identifies the importance of activities in riparian and near stream areas. It is suggested that this issue and the associated objectives, policies and methods be substantially modified to shift the focus from cumulative effects

to activities in riparian and near stream areas as it is impossible to consider the cumulative effects of land use without extensive knowledge and control over the effects of activities in riparian and near stream areas.

(f) there are a range of rural land use activities that result in disturbing the ground being carried out in Southland. The objectives, policies and methods in the current RPS appear to remain relevant and useful in the current context.

(g) rehabilitation of soil remains a relevant issue in the current context. The soil has an ability to rehabilitate itself or recover following activities that degrade or lessen the values of the resource and the way the land is managed can facilitate this process. Although this issue is well supported in policy, particularly Policy 8.6, there is a lack of explicit support for rehabilitation of soils in the relevant objectives and some revision or rewording may be necessary to remedy this.

(h) the issue of Pest plants and pest animals is relevant in the current context as pest plants and animals remain a threat to productivity, landscape values and the quality of the soil resource. Existing objectives, policies and methods provide a coherent framework for the management of pest plants and animals and thus remain relevant in the current context.

(i) the uncontrolled introduction of new organisms remains a relevant issue as the spread of pest plants and animals continues to pose a threat to economic and habitat values of the soil and water resource. This issue is adequately addressed in existing objectives, policies and methods.

(j) the lack of protection for wahi tapu and wahi taoka remains an issue of concern for the region, particularly in the current climate of rapid economic development and land use change. It is suggested that the issue and associated objectives, policies and methods be amended to reflect the potential effects of land use changes now taking place on tangata whenua values.

2.1.3.4 The following is a tabular summary of the analysis that was done.

Table 2: Soils

Issue	Relevant?	Objective	Policy
1	Y	8.1, 8.4	8.1, 8.2, 8.3, 8.4, **8.7**
2	**Y**	**5.2, 6.4**, 8.1, **8.2**, **8.4, 11.1, 16.1**	**4.5, 5.4, 5.5,** 5.2, 8.1, **8.2**, **8.5**, 8.6, **11.4, 17.5**
3	**Y**	8.1, 8.4, 8.5	8.1, **8.2**, 8.4, 8.5, 8.6
4	Y	8.1, 8.4	**5.4, 6.11** 8.1, 8.2, **8.3**, 8.5, **8.6**
5	Y	8.1, 8.3	**8.2**, 8.3
6	**Y**	**4.1,** 4.2, 8.2, **8.4**	**4.5, 5.2, 5.4, 5.5 8.2,** 8.3
7	**Y**	**6.12, 6.14, 8.1**, 9.1, **11.10**	8.1, 9.1

Table 2: Soils			
Issue	**Relevant?**	**Objective**	**Policy**
8	Y	**8.1, 14.2**	8.1, 8.2, 8.5, **8.6, 11.4, 14.5**
9	Y	**2.2,** 8.9, 9.2	8.7, **9.2**
10	Y	8.1	8.7
11	Y	1.1, 1.2, **1.3,** 1.4, **8.5**	**1.1, 1.2**, 8.4

Key:

Underlined	**The central objective or policy for this issue**
Black	Relevant
Blue	**Suggest modification to become more relevant**
Red	**No longer relevant**
Green	**Not linked in RPS, but found to be relevant**

2.2 Relevance of Issues in the Southland District Plan

2.2.1 The Southland District Plan identifies a number of issues relevant to the rural resource area. Southland District Council staff have provided the following commentary on the relevance of existing issues:

2.2.2 *Landuse Change*

2.2.2.1 The existing District plan lists the following rural issue in section 4.1 'Rural Resource Areas':

- The shift in emphasis in the use of the Rural Resource Area from traditional rural activity to production forestry and dairy farming is changing the nature of the effects land use has on the environment.

2.2.2.2 Trends in landuse change have continued since the existing Plan was adopted in 2001. An increase in the amount of dairy farming occurring in the District could be viewed as the dominant pattern of landuse change since this time. As noted in section 3.1.1, the expansion of the dairy industry has had a range of positive economic effects for the Southland region. The conversion to dairying involves substantial construction works, and ongoing inputs of skilled labour and specialist services. Dairy farming has thus become a significant driver of growth in the Southland Region. Along with these positive effects the growth of dairy farming has also given rise to a number of environmental issues. These issues are discussed further in section 3.1.1.

2.2.2.3 The planting and harvesting of forests can also give rise to a range of resource management issues as well as positive economic effects. Landuse change to production forestry has continued to occur and a number of older forests in the Southland District are due to be harvested in upcoming years. Environmental issues associated with forest planting and harvesting are discussed further under to emerging issues section of this paper.

2.2.2.4 Changes in patterns of landuse as identified in the issue above have continued to occur since the existing Plan was adopted and this issue is still considered relevant in terms of the second generation Southland District Plan.

2.2.3 *Biodiversity*

2.2.3.1 Although the existing District Plan does not specifically refer to biodiversity issues section 4.1 Rural Resource Areas lists the following two issues relating to Rural Resource Areas that are still relevant today.

- the need for adequate protection for bog pine shrublands in the Te Anau Basin.
- remnant indigenous flora and animal habitats are under threat from land use conversion.

2.2.3.2 These issues are still relevant but are likely to be addressed more fully and in a different manner in the second generation District Plan. These issues are likely to be covered in more detail in the section of the new Plan relating to biodiversity issues.

2.2.4 *Rural Dwelling Density*

2.2.4.1 The existing district plan identifies the following issues:

- residential activity in Rural Resource Areas can create pressure on Council to extend services;
- residential activities can compromise the natural, open-space character of the rural environment;
- inappropriate land management practices can adversely effect the aesthetic environment of the Rural Resource Area, which is an important component in the District's growing tourism industry.

2.2.4.2 These issues detailed in the existing District Plan are still considered relevant. The District Council has observed a significant increase in residential activity in a number of rural areas. This has been most notable in rural areas surrounding Riverton, Te Anau and Winton along with some of the coastal areas of the District. Higher density residential development has also occurred in quite isolated rural parts of the District. These patterns of residential development in some instances have resulted in pressure for Council to extend existing services. In certain areas with high landscape values residential development has had an impact on the character of rural environments. The tourism industry of the District has continued to grow and develop. The diverse and attractive landscapes of the District particularly in and around popular tourist destinations such as Stewart Island and Te Anau are an important component of their popularity with visitors.

2.2.4.3 The existing density rule PRA.3 – 'Residential Activities' provides for one new dwelling not closer than 150 metres to any existing or proposed dwelling. An additional dwelling for accommodating staff is allowed provided that the new dwelling is located on the same certificate of title and shares the same access roads as the original house. Emerging issues associated with the rural density rule and options for controlling rural density are discussed further in later sections of this paper.

2.2.5 *Rural Amenity Issues*

2.2.5.1 The existing District Plan also identifies the following issues:

- rural activities can have an adverse effect on the amenity values of the rural resource area due to the creation of noise, dust, odour, traffic generation and similar objectionable characteristics.

2.2.5.2 Rural amenity issues will need to be addressed in the second generation District Plan. There are a number of performance standards in the existing Plan that would be suitable for inclusion in the new Plan. Some of these performance standards may need to be amended or altered while there is also a need to include some new standards. These are discussed later in this paper.

3.0 Emerging Issues

3.0.1 There are a range of land use activities that have emerged as issues in the time since the drafting of the current RPS. These are activities that are either having observable effects now or are predicted to become significant issues in future.

3.1 National Issues affecting Southland

3.1.1 In Southland as in the rest of the country, a number of trends have resulted in increasing pressure on natural resources. These are the types of issues that are likely to experience a high level of media exposure, public concern and/or action at the national policy level. Water quality continues to decline across New Zealand and agricultural intensification, land use change and activities in riparian margins and near stream areas have been identified as the main causes.

3.1.2 *Dairying*

3.1.2.1 The expansion of the dairy industry has been a significant driver of intensification of land use, with a range of effects on water quality and quality of the soil resource. The high value of dairying land or land that can provide 'dairy support services' is a driver of development of areas covered by indigenous vegetation.

3.1.2.2 In 2007 there were 630 dairy farms in Southland.[4] This number has increased over

4 Agricultural Production Census (2007) Department of Statistics [Online] www.stats.govt.nz/economy/primary-production/agriculture.htm

the past 12 months[5] and further increases are expected if dairy farming continues to give superior returns on investment relative to other primary industries.[6]

3.1.2.3 The dairy industry is predicted to remain a key driver economic growth and environmental effects in the region for the immediate future for the following reasons:

- a predicted long term state of food scarcity and high consumer prices for foodstuffs[7];
- dairy farmer's ability to neutralise the power of buyers (supermarkets) that threatens the profitability of most of the world's commodity producers[8];
- climatic suitability to dairying[9] and high per-hectare production.[10]

3.1.2.4 Dairy farming is associated with declining water quality. Recent research identified linkages between increases in runoff and infiltration of contaminants such as dissolved reactive phosphorous[11], and infiltration of nitrates into groundwater,[12] and the expansion of dairy farming in Southland. Dairy farming involves high stocking rates and activities such as frequent movements of animals, inputs of nitrogen and phosphorous (both as fertiliser and bought in feed) and accumulation and discharge of effluent, all of which have been shown to involve discharge and movement of contaminants to waterways.

3.1.2.5 The expansion of the dairy industry has a range of beneficial economic effects. The conversion to dairying involves substantial construction works, and ongoing inputs of skilled labour and specialist services. Once up and running, dairy farms depend on workers and managers to care for and milk cows as well as professional contractual services from vets, artificial insemination technicians, silage contractors, drilling contractors, calf rearers and graziers. Furthermore, dairy farms source a range of 'support services' (grazing, replacement youngstock, supplements, etc) from other non-dairy farms[13]. Thus, dairy farms require

5 Consents Division report a large number of new farm dairy effluent discharge consents over the past 12 months.

6 Ministry of Agriculture and Forestry (2008) Situation and Outlook for New Zealand Agriculture and Forestry (August 2008)

7 Murphy, M. (2008) ibid

8 The ability to neutralize the power of buyers (i.e. prevent supermarkets from coordinating to drive down prices paid for agricultural products) is achieved through control the world supply of milk powder through the Fonterra Supply Cooperative: 'The Role and Significance of Cooperatives in New Zealand Agriculture: A Comparative Institutional Analysis.' Report prepared for the New Zealand Ministry of Agriculture and Forestry by Lewis Evans and Richard Meade, New Zealand Institute for the Study of Competition and Regulation. December 2005

9 Babcock Institute Discussion Paper. No. 2004-3 The Dairy Sectors of New Zealand and Australia: A Regional Study. Louis Armentano, William Dobson, Edward Jesse and Nolon Olson. The Babcock Institute for International Dairy Research and Development. University of Winsconson, College of Agricultural and Life Sciences.

10 New Zealand Dairy Statistics 2006-2007 Livestock Improvement [online] www.lic.co.nz/pdf/dairy_stats/DS-0.pdf

11Hamill and McBride (2003)

12 Sinclair Knight Merz (2008) Balfour Nitrate Hotspot. Report Prepared for Environment Southland. 30 June 2008

13 Richards, B. (2006) Dairy Runoff Management and Profitability: Case Studies in the Canterbury region of New Zealand. A dissertation submitted in partial fulfilment of the requirements for the Degree of Master of Applied Science. Lincoln University (2006).

substantial inputs of services from the local economy,[14] and have become significant driver of growth in the Region.

3.1.2.6 The growth of the dairy industry is also a driver of cultural change. Traditionally in Southland, farming businesses were passed from one generation to the next with relatively low levels of mobility of newcomers or economic change. This is in contrast to the development of the Southland dairy industry, where large numbers of people are moving into the region at the same time as high rates of economic mobility occur.[15] Part of this cultural shift is caused by the increasing occurrence of absentee ownership. Absentee owned farms tend to be business orientated, and have a strategy of intensification and capital growth.[16] Amalgamation and increases in farm sizes are also occurring; agricultural statistics show a decline from 5,375 farms in 1991 to 3,948 in 2007.[17]

3.1.2.7 The effects of dairy farming on water quality has resulted in dairying becoming a focus of community concern and a priority for legislative control both at the national and regional level. At a regional level the Regional Discharge Plan is intended to focus on the effects of dairy farming. This plan will address issues such as disposal of agricultural effluent, runoff from near stream areas and farm races, activities in sensitive catchments (e.g. the Waituna) and the effects of intensive wintering systems.

3.1.2.8 At the national level, central government actions such as the Proposed National Policy Statement for Fresh Water Management[18] may result in restrictions on activities such as discharges of effluent or intensive grazing near waterways.

3.1.2.9 The dairy industry is both economically significant and a source of cultural change and adverse environmental effects. The expansion of the dairy industry will require consideration during the review of the Regional Policy Statement.

3.1.3 *Intensification of Drystock Farms*

3.1.3.1 The intensification of drystock farming has become an issue in recent years. There

14 In the 2007/2008 year, the 'model farm' for Southland, a 500 cow dairy farm spent $281251 on (brought in) feed including winter cow grazing, and $290751 on wages and contractual services such as weed control, re-grassing and breeding. -Ministry of Agriculture and Forestry (2008) Pastoral Monitoring Early Release: Southland Dairy.

15 Simpson, J. (2000) Changing Land Use and the Effects on Community: A Case Study of the Central Southland Area.

16 For example the farm management company 'Farmright' actively promotes low costs and capital growth. See discussion on farm investment management [online] farmright.co.nz/about-farm-investment-management.php

17 University of Otago Consulting Group. Houghton, R. M., King, A., Piper, R. K. (1996) Land Use and Community in Rural Southland: A Summary of Information on economic and Social Change Since 1970 and Agricultural Production Census 1996, 1999, 2002 and 2007 (www.stats.govt.nz)

18 Ministry for the Environment (2008) Proposed National Policy Statement for Fresh Water Management. [Online] www.mfe.govt.nz/publications/rma/nps-freshwater-management/index.html

are 2805[19] drystock farms in Southland. This includes sheep and beef farms, mixed cropping farms, deer farms and dairy support farms. Although drystock farms have lower stocking rates and generally cause less environmental effects than dairy or cropping farms, they have significant effects as they are dispersed over a wider area.[20] Furthermore, some drystock farms are in hilly country with relatively high risks of erosion, surface runoff and inputs of sediment and phosphorous to waterways.[21]

3.1.3.2 On drystock farms, the majority of effects on water quality occur during winter grazing activities. During winter, stock are often intensively grazed on forage crops with substantial amounts of supplements delivered by tractors and/or silage wagons.[22] The treading of soil and passage of machinery during the wet winter period creates risks to soils and water as soil is compacted and contaminants such as nitrogen, phosphorous and sediments are released at a time when they are mobile.[23] [24]

3.1.3.3 Over the past 15 years, drystock farms have continued to intensify (to achieve more production from a given area of land). Even though sheep numbers have declined substantially, meat production has increased.[25] Fertiliser inputs per unit of production have been particularly marked:

Table 1 Sheep farm fertiliser inputs in kg per stock unit

1990/91 – 1991/92	9.7
1992/93 – 1999/2000	16.8
2000/01 – 2004/05	24.1

QSource: Meat and Wool New Zealand Economic Service

3.1.3.4 The expansion of the dairy industry has been a key driver of intensification of drystock farms over the past few years. Dairy farms rely on drystock farms for a number of bought in services, such as winter cow grazing, youngstock grazing and supplies of bought in feed.

3.1.3.5 of the environmental effects that occur over the winter period, the use of livestock farms for winter grazing of dairy cows is effectively a transfer of effects from the

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19 STATISTICS NEW ZEALAND PRIMARY PRODUCTION CENSUS 2007. FARMS BY FARM TYPE (ANZSIC06) AND REGION (1)(2) AT 30 JUNE 2007 [ONLINE] WWW.STATS.GOVT.NZ/TABLES/2007-AG-PROD/FARM+COUNTS+TABLES.HTM

20 Parliamentary Commissioner for the Environment. 2004. Growing for Good: Intensive farming, sustainability and New Zealand's Environment. Wellington.

21 SLURI (2007) Farm Strategies for Contaminant Management. A report by SLURI, the Sustainable Land Use Research Initiative, for Horizons Regional Council. 29th March 2007

22 de Wold (2006) ibid

23 McLaren and Cameron. ibid

24 Dreary A. J., Patton R. J., (2005) Soil physical quality under a cattle grazed winter forage crop. Australian Journal of Soil Research 2005, 43, 525-531

25 Woodford, K. 2006) The Intensification of Pastoral Agriculture: some trends and implications. Published in Primary Industry Management, Vol 9, No2, June 2006.

dairy farm to the drystock farm. For example a study of the Bog Burn catchment indicated that the wintering component of dairy farm systems (effectively a drystock farm) accounted for 60% of annual nitrogen losses, but only 15% of the land area.[26]

3.1.3.6 A recent analysis indicated that sheep and beef properties across New Zealand have failed to break even for four years in a row and that further price reductions or interest rate increases could lead to very severe economic effects on this sector.[27] The poor economic state of drystock farms means that farm owners are highly motivated to save costs and are often unwilling and/or unable to undertake activities that lead to environmental improvements. Thus, poor economic performance has become a barrier to achieving improved environmental results.

3.1.3.7 In the past little regulation has been adopted in RMA documents that impacts on drystock farmers. Rule 17 to the Regional Water Plan for Southland manages stock grazing within the beds of rivers and lakes.[28] The Regional Discharge Plan will relook at issues associated with drystock farming activities.

3.1.3.8 Many Southland dairy farmers send their cows to Otago for the winter where they have a substantial impact on soils and waterways[29], with most of the economic benefit of those cows retained in Southland. In future it is possible that the Otago Regional Council will attempt to put in place a ban or a limit on the transfer of cows from Southland to Otago for the winter. Such action would result in severe pressure on remaining dairy support land in Southland.

3.1.3.9 This pressure being placed on drystock farms to increase production, particularly to service the dairy industry is giving rise to adverse environmental effects that will need to be considered in the review of the current Regional Policy Statement.

3.1.4 *Arable Farming*

3.1.4.1 The existing arable farming industry holds potential for significant environmental effects. While the number of arable farms is relatively small (just over 100 farms), the favourable climatic conditions and an established and highly mobile contracting industry means that arable farming could act as a vector for rapid land use change in future.

3.1.4.2 In the past, arable farming has been a widespread activity in Southland[30] and should grain prices increase, the climate becomes warmer and dryer or GE

26 Monaghan R.M., Wilcock R.J.,. Smith L.C, Tikkisetty B., Thorrold B.S., Costall D. (2007) Linkages between land management activities and water quality in an intensively farmed catchment in southern New Zealand Agriculture, Ecosystems and Environment 118 (2007) 211–222

27 Wilson, K. (2008) Where Are We Going? National Bank Rural Report. September 2008

28 Proposed Regional Water Plan for Southland (2008)

29 Presentation by Ross Monaghan at the Southland Regional Council. Wintering Workshop. August 2008.

30 University of Otago Consulting Group. Houghton, R. M., King, A., Piper, R. K. (1996) Land Use and Community in Rural Southland: A Summary of Information on economic and Social Change Since 1970.

cultivars become available it may become a significant land use again.

3.1.4.3 The effects of arable farming may include nitrate leaching and damage to soil structure. Since most arable farmland is on relatively flat land, there is minimal risk of phosphorous runoff resulting from arable farming, even though arable farming activities involve substantial inputs of phosphate fertiliser.[31]

3.1.4.4 Leaching losses of 30-60 kilograms per year are 'not unusual' on cropping farms.[32] The majority of nitrate leaching occurs during the post harvest fallow period when nitrates are incorporated back into the ground and over winter, prior to the next growing season. Balfour is an example of an area in Southland where nitrate leaching (primarily from fertiliser inputs associated with arable farming) have resulted in nitrate-nitrogen levels above acceptable drinking water standards (up to 20g/m3).[33]

3.1.4.5 The passage of heavy machinery and disturbance of the soil during cultivation and harvest means that Arable farming may also result in significant soil damage or loss of the soil resource.[34] Soil may become compacted due to disruption of aggregates and passes of heavy machinery.[35] A recent report found that intensive crop soils in Southland had high bulk density and erodible aggregates, relative to soils under other forms of land use.[36]

3.1.4.6 While the flat aspect of most arable farms means that the risk of water erosion is low, significant amounts of soil may be lost during wind events around the time of cultivation and crop establishment.[37]

3.1.4.7 Currently, the only regulatory controls applying to intensive cropping activities in Southland apply to the use of sprays and agrichemicals. The focus of national and regional attention has been on the effects of the expanding dairy industry and intensification of pastoral farming. This lack of regulation combined with an established contracting industry means that cropping has potential to act as a vector for rapid land use change if high commodity prices or a crisis in other industries (such as dairying or sheep farming) resulted in the sudden availability of large amounts of land.

3.1.4.8 A change in the legal status of genetically engineered (GE) cultivars would increase the competitiveness of arable farming relative to other land uses. A lack of

31 Meneer et al. ibid

32 Meneer et al. ibid

33 Sinclair Knight Merz (2008) Balfour Nitrate Hotspot. Report Prepared for Environment Southland. 30 June 2008

34 McClaren and Cameron. ibid

35 Beare, M. and Tregurtha, C. (2004) Soil Quality on Southland Cropping Farms: A guide to monitoring and best management practices. New Zealand Institute for Crop and Food Research Limited.

36 Bearem M H, Lawrence E J, Tregurtha, C S, Harrison-Kirk T, Pearson, A, Meenken, E D (2005) Progress towards the development of the Land Management Index – 2004-05 project report. Crop and Food Confidential Report No. 1408. June 2005.

37 McClaren and Cameron (1993) ibid

evidence against the use of genetically engineered crops,[38] and market changes overseas mean that it may become difficult to justify continued restrictions on the use of GE crops in New Zealand.[39] In Southland, GE cultivars would have potential to reduce much of the difficulty and risk of cropping as well as increasing yields or value of the final product.

3.1.4.9 The frequent cultivation and disturbance of the ground and risks to water quality means that arable farming may also be of interest to the tangata whenua.

3.1.4.10 Notably arable farming has the potential to act as a medium for intensification of land use in Southland resulting in potential adverse effects. This issue will require consideration during the review process of the current Regional Policy Statement.

3.1.5 *Land Use in Upland/High Country Areas*

3.1.5.1 In recent years, land use change has been observed in upland and tussock land areas. Over 240,000 hectares of Southland are in high country or tussock lands. Much of this land is land above 900 meters in elevation and is not farmed intensively.

3.1.5.2 High country areas are valued for their landscape, ecosystem, biodiversity and productive values. Most high country areas in the South Island are dominated by snow tussock, a slow growing, but long lived plant that has been found to have a number of beneficial environmental and ecological effects.

3.1.5.3 Snow tussock grasslands are very effective at intercepting water from fog. Radio isotope studies indicate that fog captured by snow tussocks accounts for more than 50% of water flowing from upland catchments.[40] Removal of tussocks and planting of trees or pasture has been found to result in substantial reductions in water captured from a given area of high country catchment.

3.1.5.4 The landscapes of some high country areas in Southland are recognised as being iconic and unique, particularly those in and adjoining National Parks. However many such areas are not pristine, with fire by both Maori and Europeans having resulted in forested areas being lost and replaced by tussock

3.1.5.5 Economic activities in high country areas are limited to extensive pastoral farming and some commercial recreation and tourism. These are generally of a low economic level, and associated with a unique community and lifestyle.

3.1.5.6 Threats to the values of high country areas include:

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38 Channapatna S. Prakash (2001) The Genetically Modified Crop Debate in the Context of Agricultural Evolution Plant Physiol, May 2001, Vol. 126, pp. 8-15

39 Gault, A.(2001) To GE or Not to GE? New Zealand's Dilemma New Zealand Nuffield Farming Scholarship Trust.

40 Mark A. F. and Dickinson, K. J. M. (2008) Maximizing water yield with indigenous non-forest vegetation: a New Zealand Perspective. Front Ecol Environ 2008; 6(1): 25-34

- soil erosion associated with roading, burning and/or intensive grazing;
- invasion by exotic plants and animals;
- visual impacts of any ground disturbance or structures;
- impacts on amenity values, including a sense of isolation.

3.1.5.7 Soil erosion has resulted from activities such as road construction on scree slopes, the practice of burning and intensive grazing. The impacts of these continue for many years.

3.1.5.8 Invasive exotic plants (wilding pines and heiracium) present a significant threat to the biodiversity of upland areas. These species out-compete and displace other species in the alpine environment.[41] Discussions with runholders and field trials indicate that some degree of grazing management may be required to suppress invasive exotic species and maintain biodiversity values.[42]

3.1.5.9 Historically, high country have not supported support intensive grazing above 900 meters as farmers are unable to recover the costs of oversowing and topdressing.[43] However this may change if the values of productive lands increase and climatic conditions become milder.[44]

3.1.5.10 In recent years, land use change has been observed in upland and tussock land areas. High prices for agricultural products or grazing and changes to land tenure mean that pressure to change land use may continue for some time. Changes to land tenure mean that farmers are able to justify developments such as fencing and water systems and that some areas will be retired from all grazing, which may actually result in invasion by exotic species and a reduction in biodiversity values.

3.1.5.11 The points raised above recognise that some existing activities and changes to activities occurring in upland and high country areas may lead to loss of water quality, modifications of landscapes and reductions in ecological flows and water levels. This issue will require consideration during the review of the current Regional Policy Statement

3.1.6 *Pest plants and animals in crown lands and natural areas*

3.1.6.1 The proliferation of pests in Crown lands and the effects that result in or near these areas has become an issue in recent years.

3.1.6.2 Large areas of the Region are managed by public entities. The proliferation of pests and the effects that result in or near these areas has become a regionally significant issue in recent years. Areas managed by crown agencies include:

- Road reserves – territorial authorities and New Zealand Transport Agency
- Rail corridors – Ontrack
- River Beds – Land Information New Zealand and Department of

41 Espie, Peter (2005) Landscapes in Transition. Proceedings of High Country Landscapes Management Forum. Queenstown, 2005.

42 Mead, Nicky and Elstob, Burt (2005) Managing obelisk, a semi-arid high country run. Proceedings of High Country Landscapes Management Forum. Queenstown, 2005.

43 Mark, Alan (2005) Fifty years of snow tussock grassland research applied to high country landscape management. Proceedings of High Country Landscapes Management Forum. Queenstown, 2005.

44 SONZAF (2008) ibid

Conservation

- National Parks Department of Conservation
- Reserves – Department of Conservation and territorial authorities

3.1.6.3 Road reserves and rail corridors act as a conduit for the spread of undesirable organisms via the transport network. In extreme cases, the effectiveness of components of the transport infrastructure may be hindered by the physical presence of pest plants.

3.1.6.4 In waterways, pest plants may trap sediment or gravel, resulting in diversion of water and inundation of nearby land during flood flows. Pest plant animals may cover areas of gravels or sand that form habitat for indigenous species, notably breeding areas for native birds. Finally, lakes may also be susceptible to the establishment and spread of aquatic weeds.[45]

3.1.6.5 In national parks and reserves the high palatability of indigenous flora and mobility of pest animals means that introduced fauna have significantly modified the forest ecosystems in these areas.[46] Animals such as deer, possums are present in large numbers and place significant grazing pressure on the vegetation of the understory and canopy. Pigs and goats have a lesser, but still significant effect. Chamois and Himalayan Thar have potential to have significant effects on alpine vegetation.[47]

3.1.6.6 Problems have been reported at the interface between crown land and privately owned land.[48] The purposes of crown land and productive land are very different and these differences may result in pest management approaches that are incompatible. While the primary goal of a national park is preservation[49], the goals of landowners relate to having a productive farm system, with the need to avoid costs of pest suppression and/or compliance costs a secondary driver. These goals may be incompatible as from one perspective there may be little value in suppressing pests in boundary zones as these areas are ecologically compromised, even though the proliferation of pest plants and animals in these areas creates a nuisance for adjoining landowners.

3.1.6.7 The management of pest plants and animals is beyond the scope of the pest management strategy. Pest plants and animals continue to proliferate within Crown land with consequent effects on ecosystem values within these areas and productive values of adjoining lands.

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45 Southland Regional Council (2007) ibid

46 Department of Conservation (2007) Fiordland National Park Management Plan. JUNE 2007. Southland Conservancy Conservation Management Planning Series. Published by Department of Conservation, PO Box 743, Invercargill, New Zealand.

47 Department of Conservation (2007) ibid

48 Southland Regional Council (2007) ibid

49 New Zealand Conservation Authority (2005) General Policy for National Parks. Produced by the Department of Conservation for the New Zealand Conservation Authority, PO Box 10 420, Wellington.

3.1.6.8 This is a consequence of the Biosecurity Act which does not bind the Crown. However, the Crown and Crown Agencies may agree to carry out pest control on Crown land by negotiation with other agencies and private land occupiers. Management of pest plant and animals in National Parks will require address during the review of the current Regional Policy Statement.

3.1.7 *Access and unformed roads*

3.1.7.1 Access along legally existing access strips or 'paper roads' is a contentious issue in several regions, including Southland. Landowners do not welcome full access rights across their properties, which may create conflicts with members of the public who wish to exercise legitimate rights of access.

3.1.7.2 New Zealanders have long enjoyed access to the coast, rivers, lakes and wetlands, public reserves, national parks and many high country areas. In many cases access across private land is required to reach these areas. Access to the coast and river and lake boundaries is particularly valued for the opportunity to indulge in fishing and other traditional recreational activities. Access to wetlands areas is required for hunting and traditional food gathering activities. The public also require access to high country areas to undertake recreational activities such as tramping, hunting and four wheel driving.

3.1.7.3 Under New Zealand legislation, there are a variety of statutes that provide for access across private land. Access is able to be provided for public use by:

- esplanade reserve, where the area is held in public ownership;
- esplanade strip, where land is held in private ownership but restrictions imposed upon the use of the land, with conditions imposed upon the property title;
- access strip, where a negotiated agreement can provide for the restricted use of land;
- marginal strip created under section 24 of the Conservation Act 1987 adjoining the coast, lakes of more than eight hectares in area and rivers wider than three metres. There are legal difficulties with loss of marginal strips due to bank erosion or accretion;
- unformed legal roads.

3.1.7.4 There are an estimated 5,430 kilometres of unformed roads in Southland. The majority of unformed roads were put in place at the time of settlement and never constructed. Legally, anyone has a right to pass unimpeded along them. Unformed roads are generally incorporated into farm systems, even so, members of the public can access unformed roads both on foot and with four-wheel-drive vehicles and motorbikes.[50]

[50] Ministry of Agriculture and Forestry (2007) Walking Access Report: Report to the Minister of Rural Affairs. [online] walkingaccess.org

3.1.7.5 The issue of access is complex and contentious, with a divergence of opinion over rights of access between adjoining landowners and members of the public expect to be able to gain access to coastlines, rivers and public land, while landowners expect control over who is allowed access to the land they farm and what they do while they are there.[51] Particular difficulties exist with issues such as:

- lack of clarity or knowledge about existing access rights and lack of information available to public with regards to access rights;
- the belief by adjoining landowners that they have a right to restrict access on unformed roads;
- blocking or lack of provision for access to unformed roads;
- the behaviour of or nuisance caused by those who are allowed access;
- liability to adjoining land owners for the safety of people who have access over land they farm;
- irresponsible use of motor vehicles on unformed roads[52].

3.1.7.6 In some cases the location of a legal access may not be the most convenient for either the land occupier or the public. Consideration of alternative access routes may be desirable.

3.1.7.7 Loss of public access to streams, rivers, lakes, estuaries and other areas as a result of rural subdivision, use and development is a resource management issue for both the regional and district councils. The wishes of the public to exercise their right to use legally existing access strips and the wishes of land occupier to undertake rural activities without being interfered with will need to be considered during the review of the current Regional Policy Statement. The second generation District Plan could also look to maintain and enhance public access where feasible when processing resource consent applications in Rural Resource Areas.

3.1.8 *Climate Change*

3.1.8.1 Climate change is predicted to result in changes to the region, both in terms of the type of farming that can be carried out and emergence of threats such as increasing frequency and severity of droughts or inundation of coastal margin areas.

3.1.8.2 Rainfall and temperature regimes and the frequency of severe weather events varies over time in natural systems. In recent times the climate has been observed to become warmer, with greater extremes of wet and dry and increased frequency of severe weather events. In New Zealand, changes in temperature and rainfall are predicted to have implications for land use and risk management in all parts on New Zealand. Changes to levels of productivity and viability of some land use

[51] Walking Access. Speech by the honourable Damien O'Connor. Speech at South Island High Country Committee of Federated at Farmers Field Day. 26 MARCH, 2007

[52] Adapted from Ministry of Agriculture and Forestry (2007) ibid

industries are also expected.[53]

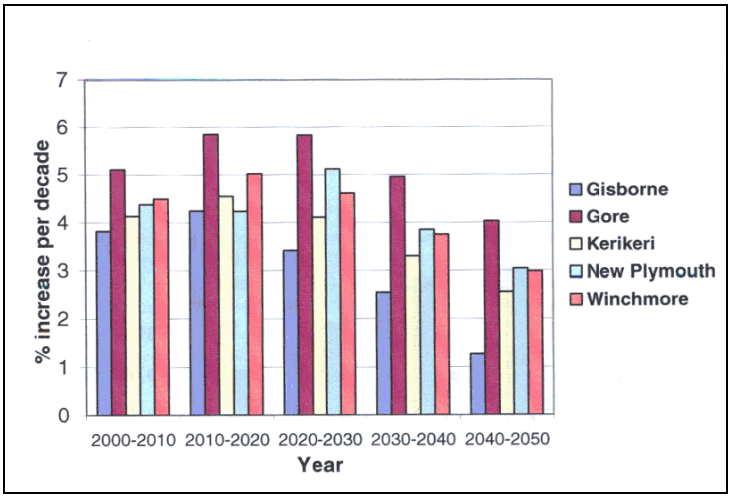
3.1.8.3 The following table shows predicted changes in temperature and precipitation across various parts of New Zealand (including Southland):

Table 1: Range of projected changes in annual mean temperature and precipitation between 1970–99 and 2070–99 from four different global climate models, for continued increases in greenhouse gas emissions[54]

Region	Northland, Auckland	Western North Island from Waikato to Wellington	Eastern North Island from Bay of Plenty to Wairarapa	Nelson, Marlborough, to coastal Canterbury and Otago	West Coast and Canterbury foothills	Southland and Inland Otago
Temperature (°C) 3	+1.0° to 2.8°C	+0.8° to 2.7°C	+0.9° to 2.7°C	+0.8° to 2.5°C	+0.6° to 2.5°C	+0.6° to 2.2°C
Precipitation (%) 5	–10% to 0%	0% to +20%	–20% to 0%	–20% to +5%	+5% to +25%	0% to +30%

3.1.8.4 In Southland climate change is predicted to result in a higher risk of droughts, milder winter temperatures and more severe westerly storms or gales.[55] Current climate change models indicate that pastoral farms will experience an increase in production as a result of increased carbon dioxide levels in the atmosphere and an extended growing season.[56]

Figure 1. Predicted changes in pasture production across various sites in New Zealand as a result of climate change



53 Kenny (2001) ibid

54 Adapted from: Kenny, G. (2001) Climate Change: Likely Impacts on New Zealand Agriculture. A report prepared for the Ministry for the Environment as part of the New Zealand Climate Change Programme Gavin Kenny Earthwise Consulting Ltd Hastings. Published in September 2001 by the Ministry for the Environment PO Box 10-362, Wellington, New Zealand

55 Ministry of Agriculture and Forestry (2008) Climate Change - A New Zealand Perspective: Physical And Environmental Impacts Of Climate Change

56 Ministry of Agriculture and Forestry (2008) Situation and Outlook for New Zealand Agriculture and Forestry (August 2008)

3.1.8.5 Climate change models predict increases in pasture production in the Southland region. According to these models, the humid, but cool Southland climate will result in significant improvements in pastoral production relative to other regions.

3.1.8.6 Climate change will likely affect what crops can be grown in a given location and the intensity with which particular areas can be used. Arable crops in particular are predicted to benefit from warmer conditions and higher rainfall. Enterprises that are sensitive to cooler climates such as maize production may become viable in Southland.[57]

3.1.8.7 Climate change creates some risks to the resources of the Southland region. These include:

- less rainfall in upper catchment areas and lower flows in rivers;
- increasing demand for irrigation at the same time as aquifer recharge is reduced through climatic changes;
- increased frequency of drought;
- increased frequency of severe weather events;
- more problems with pests and diseases in a warmer climate;
- sea level rise.[58]

3.1.8.8 Legislation may also affect how land is used and are likely to reward or favour land use practices that involve fixing of atmospheric carbon. For example, under the emissions trading scheme, it may be that landowners will have an incentive to retire areas that are marginal for pastoral production into indigenous vegetation or forest. The emissions trading scheme might also result in lower numbers of ruminant animals in areas of lower value farmland and improved uptakes of tillage techniques that maintain organic matter levels in soils (and thus fix carbon). Environmental improvements might also result, for example as runoff from steep land and arable farms is reduced.

3.1.8.9 Climate change has a range of implications for the way that land is used. These include increased production, increased climatic risk and the possibility of loss of land due to inundation. Land use changes may also result from legislative responses to climate change. The potential effects of climate change and the implications for rural land management in the region and districts mean that climate change is issue will need to be addressed during the review of the current Regional Policy Statement and in the development of the second generation Southland District Plan.

[57] Ecoclimate (2008) ibid

[58] Consultation with Invercargill City Council suggests that sea level rise presents a significant threat to the Awarua Industrial Area. As such any developments in this area (on land within 5 meters of sea level) must be designed so that it can be relocated in the event of sea level rise.

3.2 Regional Issues

3.2.1 There are several issues that are specific to the Southland region. These are issues that are regionally significant, but do not experience significant exposure at the national level. These issues are likely to experience a medium to low level of public interest and/or intervention from central government.

3.2.2 *Forestry*

3.2.2.1 Southland has a significant forestry industry. In 2007, the area of planted production forestry in Southland was around 90,900 hectares. Most of the wood grown in the region is processed in the lower South Island with less than 20% of the wood exported as logs. Investment in local wood processing has increased significantly in recent years, particularly the expansion of sawmills.

3.2.2.2 Most of the region's planted forest is on inland hill country. The region has relatively more Douglas fir and hardwood species (eucalyptus) than the rest of New Zealand and less radiata pine. In some areas of Southland, altitudes and a cooler climate are more suited to Douglas fir than radiata pine. A high proportion of these hardwood species are exported to Japan as chips.

3.2.2.3 Timber is processed at sawmills in western and eastern Southland. The major sawmills in the region are Craigpine Timber Company, Brightwood New Zealand Ltd, Niagara Sawmilling Co, and Blue Mountain Lumber Ltd. There is also Southland Veneers, a medium density fibreboard (MDF) plant (Dongwha Patinna NZ Ltd), and a chipping plant (Southwood Export Ltd). The forestry sector and associated processing plants account for 4.8% of the region's total employment and 6.7% of Southlands real GDP.

3.2.2.4 Forestry planting in Southland has expanded significantly since deregulation of the industry in 1980. The volume of wood harvested expanded from 780,000 cubic metres in 1990 to 1,560,000 cubic metres in 2003.[59] The amount of trees available for harvest is expected to remain stable for the next few years, before undergoing rapid increases in volumes sometime between 2010 and 2025, with sustained production for at least two decades after this.[60] Forecasting volumes to be harvested is difficult as harvest times have some flexibility and are subject to changes in prices of forest products.

3.2.2.5 The planting of trees at a commercial scale can give rise to adverse effects, including:

- loss of scenic views when planted close to roads or adjoining public rest areas or reserves;

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[59] Berl "The Contribution of the Forest and Wood Processing Sector to Otago and Southland" 2005

[60] Ministry of Agriculture and Forestry (2007) *Otago and Southland Wood Availability Forecasts for the Period 2007–2040*. http://www.maf.govt.nz/mafnet/publications/woodavailability/ otago-southland2006/

- icing of roads from the effects of shading;
- damage to archaeological or cultural sites;
- visual effects when significant landscapes are planted;
- reduction in the quantity of water flowing from the catchment.

3.2..2.6 Forestry also has positive environmental effects, including:

- helping secure unstable ground
- reducing the impact of high intensity rainfall events
- providing areas suitable for recreational activities
- acting as carbon sinks

3.2.2.7 Of most concern are the potential adverse effects during the harvesting of trees. These include:

- sediment discharges to water bodies, affecting water quality, waterway dynamics and aquatic ecosystems;
- activation or acceleration of erosion by physical disturbance or water flow runoff;
- soil compaction and soil displacement;
- visual effects;
- risk of contamination of land or water from fuels and oils stored and used on site;
- effects of burn offs e.g. air quality, removal of vegetation cover, habitat destruction and destruction or damage to public utilities, and neighbouring properties.[61]
- damage to public roads as a result of large numbers of heavy vehicles using a particular route over a short period of time.

3.2.2.8 The ability to manage forestry activities through current legislation, including rules in district and regional plans, gives adequate protection from the adverse effects of forestry operations while permitting an economically significant industry to expand in the future.

3.2.2.9 Adherence to the New Zealand Environmental Code of Practice for Plantation Forestry appears to provide an effective framework to minimise the adverse effects of forest harvest activities.[62]

3.2.2.10 Since trees store carbon emissions trading legislation is likely to make forestry more profitable. It is highly likely that forest owners will be incentivised or required to replant forested areas, thus maintaining them in perpetuity.[63]

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61 Adapted from New Zealand Forest Owners Association (2007) New Zealand Environmental Code of Practice for Plantation Forestry First Edition August 2007. © Copyright 2007, FITEC, New Zealand

62 Dairying and Declining Water Quality: Why has the Dairying and Clean Streams Accord not delivered cleaner streams? Neil Deans: Fish & Game New Zealand Kevin Hackwell: Forest & Bird

63 Ministry of Agriculture and Forestry (2008) Impact of the ETS on Forest Management Piers Maclaren Bruce Manley & Final Year School of Forestry students1 June 2008 Report produced for MAF Policy under CC MAF POL_2008/10 (110/1) Objective 1

3.2.2.11 The planting of forests can give rise to adverse effects. Control in terms of areas planted, and promotion of suitable management practices, will minimise adverse environmental effects. This issue will need to be addressed during the review of the current Regional Policy Statement and the development of the second generation Southland District Plan.

3.2.3 *Activities in National Parks*

3.2.3.1 There are various land use activities within National Parks. While the scope and effects of these activities are relatively minor at this stage, the divergence of values assigned to these areas means that significant scope exists for conflict and tension over the proper use of resources within them.

3.2.3.2 The National Parks of New Zealand are a fundamental aspect of national identity and cultural life and the preservation of the values of national parks for current and future generations is seen as essential in a policy context.[64] The national parks of New Zealand include landscapes and ecosystems that are unique in the world and are treasured both by New Zealanders and international visitors. As well as providing substantial ecological and natural values, the amenity values of national parks attract tourists who contribute significantly to the New Zealand economy each year.

3.2.3.3 There are two national parks in the Southland Region; Rakiura and Fiordland. These cover just over 60% of the land area of Southland. They include:

- coastal ecosystems and significant natural features that make them unique and valuable, both in a national and international context.
- unique coastal environments (Mason Bay and the Fiordland coastline);
- higher altitude alpine ecosystems dominated by snow tussock-cushion moorland;
- (in Fiordland) an extensive system of glacier formed fiords and lakes;
- extensive areas of temperate rainforest;
- pristine terrestrial and aquatic ecosystems.

3.2.3.4 The National Parks of the region provide homes for a large number of indigenous species that require preservation. These include forest bird species such as the kiwi, kaka, käkäriki, kakapo,[65] yellow-crowned parakeets, robins and möhua (yellowheads) and weak, and oceanic and aquatic bird species such as the sooty shearwater and mottled petrel the Fiordland crested penguin, gulls and ducks. An estimated 300 species of insect are endemic to Fiordland National Park. These include, large alpine weevils, large land snails, a large fly (Exul singularis), six

64 New Zealand Conservation Authority (2005) General Policy for National Parks. Produced by the Department of Conservation for the New Zealand Conservation Authority, PO Box 10 420, Wellington.

65 Department of Conservation (2006) Stewart Island / Rakiura Conservation Management Strategy Review And Rakiura National Park Management Plan Preparation Discussion Document SOUTHLAND CONSERVANCY, SEPTEMBER 2006. Published by: Department of Conservation Southland Conservancy, Box 743, Invercargill 9840, New Zealand

indigenous species of butterfly and over 700 species of moth.[66]

3.2.3.5 The National Parks of the region attract a large number of visitors who desire a range of experiences and levels of support and service. The Milford Road provides access to unique wilderness areas for hundreds of thousands of visitors each year, while in other areas, visitors are able to enjoy remote wilderness experiences where they are entirely self reliant.

3.2.3.6 The Fiordland National Park also contains extensive natural resources such as mineral resources, supplies of fresh water and hydro-electric power generation capacity. Even though these resources are protected by a range of legislation and treaties (including world heritage area status), it is important to consider whether the current level of protection is sufficient, or even justified in the face of increasing economic value of these resources.

3.2.3.7 *Visitors*

3.2.3.7.1 The National Parks have large numbers of visitors each year. One of the key roles of national parks is to provide for those who want to enjoy and experience the natural values of the national park in ways that do not conflict with other purposes such as protection and preservation.[67]

3.2.3.7.2 Fiordland and Stewart Island National Parks have broad appeal in that they provide for a variety of wilderness experiences and types of visitors, ranging from guided tours on Milford Road and or cruises to remote wilderness experiences that require total self reliance and a high level of wilderness experience. One of the tasks of resource managers is to manage visitors so that the rich variety and quality of experiences offered by national parks is maintained.

3.2.3.7.3 Infrastructure and support services exist to provide for the safety and comfort of visitors, ranging from road access and accommodation provided for in the Milford Area to the network of tracks and hunters huts in Stewart Island.

3.2.3.7.4 The number of visitors to national parks is increasing with significant effects beginning to occur[68] and physical capacity limits exceeded in some areas. The Milford Road carries 450,000 people each year and this number is increasing by 7% per annum. The effects currently being experienced in the Milford Area may further increase as areas are opened up for access the Milford-Dart application, for example has already been approved.

3.2.3.7.5 Water and air travel is becoming much more common and there has been a consolidation and increase in scale of tourism operators. There are now organised movements of large numbers of people into national parks at a number of

66 Adapted from Department of Conservation (2007) Fiordland National Park Management Plan. JUNE 2007. Southland Conservancy Conservation Management Planning Series. Published by Department of Conservation, PO Box 743, Invercargill, New Zealand.

67 New Zealand Conservation Authority (2005) General Policy for National Parks. ibid

68 Consultation with representatives of the Department of Conservation.

localities besides the Milford and Dusky Sound areas. These include large vessels moving people to land in national parks, water based helipads, large hunting parties of over 30 individuals, large walking groups and large camping groups.

3.2.3.7.6 Visitors can have effects such as:

- disturbance of birds and marine mammals;
- physical damage from trampling in alpine environments;
- dispersal or transfer of pest plants;
- effects on sensitive natural ecosystems;
- in areas where visitor numbers are high, effects such as track degradation, loss of 'wilderness experience' and congestion and overcrowding (Milford Sound and Milford Road);
- effects on water quality from inappropriate waste disposal.[69]

3.2.3.8 *Natural Resources*

3.2.3.8.1 Under current resource management law, National Parks are administered by central government and non-recreational land use activities are greatly restricted. Examples of non-recreational land use that might occur in national parks include electricity generation, mining and extraction of water resources.

3.2.3.8.2 There are extensive hydro-electric resources in Fiordland[70], some of this has already been developed, for example the Monowai and Manapouri schemes, however much untapped capacity remains. Accessible hydro resources include the Te Anau Gates and Haurako – Poteriteri schemes (both of which would generate in excess of 100 megawatts) and enhancement of the Manapouri scheme.

3.2.3.9 *Legislation*

3.2.3.9.1 There is a wide range or relevant legislation designed to protect and uphold the values of National Parks. This includes the Resource Management Act, The National Parks Act, the national policy on national parks and national park management plans. This legislation combines to determine how the roles and values of national parks relate to human activities carried out.

3.2.3.9.2 The National Parks Act (1980) identified national parks as fundamental to national identity:

> *'…the provisions of this Act shall have effect for the purpose of preserving in perpetuity as national parks, for their intrinsic worth and for the benefit, use, and enjoyment of the public, areas of New Zealand that contain scenery of such distinctive quality, ecological systems, or natural features so beautiful, unique, or scientifically important that their preservation is in the national interest.' (section 4(1), National*

69 Adapted from Adapted from Department of Conservation (2007) Fiordland National Park Management Plan. ibid

70 Duffill, Watts and King Ltd (1981) Small Hydroelectric Resource Assessment – Southland. Commissioned by New Zealand Energy Research and Development Committee, University of Auckland, Private Bag, Auckland.

Parks Act 1980)[71]

3.2.3.9.3 In other words the preservation of the values of national parks is a matter of the national interest.

3.2.3.9.4 The National Policy Statement on National Parks goes further.:

> *'…National parks are held for their intrinsic worth – that is for the value that they have, just because they exist - quite separate from any value that humans may ascribe to them. They are places where human interference, modification and control should be minimal, and enjoyment of them should be on nature's terms.'*[72]

3.2.3.9.5 In other words national parks are assigned an almost sacred status that takes priority over human concerns including that of tangata whenua (see below).

3.2.3.9.5 Under such frameworks, activities such as mining are severely restricted. This is recognised in the Crown Minerals Act 1991. The exceptions are extraction of pounamu (for which protocols are being developed) and gravel extraction for the maintenance of Milford Road. Activities within National Parks are not managed under the RMA unless there are "significant adverse effects" beyond the park boundaries.[73]

3.2.3.10 *Kaitiakitanga and relationships with Tangata whenua*

3.2.3.10.1 Kaitiakitanga is the means by which the mauri (life force) of lands and waterways is conserved and enhanced for future generations. Relationships with Tangata whenua must be developed and maintained to ensure that resource management is consistent with the concept of kaitiakitanga.[74]

3.2.3.10.2 The development of protocols for extraction of pounamu is an example of collaboration between the tangata whenua and the central government on management of resources within the national park.

3.2.3.10.3 The points raised above recognise that activities within National Parks can have implications and adverse effects beyond the boundary of the Parks. Furthermore the perceived values of national parks (including ecological values, amenity or visitor values and the economic value of hydro-electric or mineral resources) may be mutually incompatible, creating potential difficulties in achieving sustainable management of National Parks. The review of the current Regional Policy Statement will need to consider these issues.

71 New Zealand Conservation Authority (2005) General Policy for National Parks. ibid

72 New Zealand Conservation Authority (2005) General Policy for National Parks. ibid

73 RMA section 4(2)

74 Department of Conservation (2007) Fiordland National Park Management Plan ibid

3.2.4 *Coastal Margin Areas*

3.2.4.1 The Southland coastal environment is a unique and treasured aspect of the natural resources of the region. Coastal environments include seacliffs, series of coastal bays and headlands, the Awarua-Waituna-Toetoes wetland complex and a number of beaches.

3.2.4.2 The values of the coastal environment are primarily ecological and aesthetic. Much of the Southland coast is formed of striking landforms, such as high cliffs, rock formations, eroding coastline, river mouths and lagoons. The unique coastal environment also provides habitat for coastal flora and fauna. Some settlements nestle comfortably into this environment and have their own natural character, for example, Cosy Nook, Fortrose and Bluecliffs.[75]

3.2.4.3 Although the effects of historic land uses in the coastal area have generally been minor and in keeping with the character and values of the coastal environment, further development has the potential to degrade these values. Developments that have potential to have adverse effects on the coastal are include:

- coastal housing developments in otherwise unmodified areas;
- the construction of large, visually imposing houses that are not in harmony with the landscape;
- increasingly intensive agricultural activities;
- planting of forests and shelter belts on the coastal margin;
- roading and associated facilities for recreational and tourism purposes.[76]

3.2.4.4. Adverse effects of activities in the coastal environment may include:

- visual sensitivity and loss of unique coastal character, particularly in areas with high visitor numbers or able to be viewed from main roads;
- removal of sand dunes and vulnerability of coastal areas to erosion;
- clearing of the existing coastal indigenous forest or shrublands;
- erosion of the coastal cliffs;
- deterioration in water quality and habitat of riparian river margins and lagoon;
- disruption or disturbance of wildlife;
- loss of ecological values;
- loss of recreational values;
- loss of access.[77]

75 Boffa Miskell (2006) Southland Coastal Landscape Study. Prepared for Environment Southland and Southland District Council by Boffa Miskell Limited August 2006

76 Adapted from Boffa Miskel (2006) Southland Coastal Landscape Study. ibid

77 Adapted from Boffa Miskel (2006) Southland Coastal Landscape Study. ibid

3.2.4.5 Such development also brings with it domestication of the rural landscape (a presence of buildings, street lights etc).

3.2.4.6 The Resource Management Act requires Councils, in achieving the purpose of the Act, to recognise and provide for the protection and management of natural character and natural features of the coastal landscape from inappropriate subdivision use and development.

3.2.4.7 The New Zealand Coastal Policy Statement[78] defines a range of matters as 'national priorities'. These include:

- encouraging appropriate subdivision, use or development;
- avoiding sprawling or sporadic subdivision;
- taking account of and acting to retain the natural character of coastal environments;
- avoiding effects on indigenous flora, fauna or ecosystems;
- preservation of important elements of the coastal environment;
- preservation of the natural movements of sediments, water air;
- preservation of intrinsic values of ecosystems.

3.2.4.8 All subdivision requires approval by way of resource consent. That is the main mechanism by which development in coastal margins is managed. Where development is intended that is greater in intensity envisaged by the predominantly rural provisions of district plans then land use consent is also required. Territorial authorities therefore are the agencies that have most responsibility in this area.

3.2.4.9 Notably development within the coastal environment can give rise to adverse environmental effects. This issue will require consideration during the current Regional Policy Statement review.

3.2.5 *Indigenous Vegetation*

3.2.5.1 There is a lack of legal protection or clarity around the status of indigenous vegetation on private land, with the result that high prices for farmland and widespread agricultural intensification are a threat to the values of these areas.

3.2.5.2 Historically, all productive land in Southland was covered by indigenous vegetation and the clearance of these areas was accepted as a productive and valuable way to increase areas of productive land. Nationally, Southland has large area of remaining indigenous vegetation, both on public and private land. Despite this, remaining areas of indigenous vegetation become scarce and community appreciation of them increases, the clearance of vegetation has become less accepted and better protections are required.

78 Ministry for the Environment (1994) NEW ZEALAND COASTAL POLICY STATEMENT 1994 This New Zealand Coastal Policy Statement 1994 was issued by notice in the Gazette on 5 May 1994.

3.2.5.3 Areas of indigenous vegetation enjoy very little protection under District Plans. This is particularly problematic for wetland conservation as there is very little to stop farmers de-vegetating wetlands (after which they cease to be wetlands under the definition in the water plan.) This issue has become evident since the drafting of the current Regional Policy Statement and will require consideration during the review process.

3.2.5.4 The second generation District Plan in the framing of indigenous vegetation issues will need to have a new focus on biodiversity. The Council has specific functions under the RMA 1991 in relation to controlling the effects of the use, development, or protection of land for the purpose of maintaining indigenous biodiversity. The Rural Resource Areas of Southland District contain significant areas of indigenous vegetation and habitats of indigenous flora and fauna. The potential effects of subdivision, use and development on the biodiversity values of these areas will need to be addressed as a rural resource management issue in the new Plan.

3.2.5.5 There is significant development pressure being placed on many of the remaining areas of indigenous vegetation located on private land in the Southland District.

3.2.5.6 In recent times Environment Southland and Southland District Council staff have observed extensive clearance, drainage and land development of areas of natural vegetation on privately owned land.[79] Thus is occurring as a result of the high economic value of productive land coupled with a lack of legal protections has created incentives for land owners to clear remaining areas.

3.2.5.7 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, beef and deer farming. As rural landowners look to maximize 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 also come under development pressure in these situations.

3.2.5.8 The problem is made more difficult by a lack of understanding of remaining areas of indigenous vegetation; the location and extent of these areas, and the habitat values or ecosystem services that result from them.

3.2.5.9 Low land indigenous vegetation is possibly under the most pressure from landuse change and is a key at risk area. The scale and extent of de-vegetation and central government's national priorities for protecting rare and threatened native biodiversity on private land indicate that a focus on certain at risk areas would be

[79] Consultation with Richard Bowman 18-09-2008

an appropriate in the coming review of the Regional Policy Statement and Southland District Plan.

3.3 Local Issues

3.3.1 These are issues that are region-wide in scope, but local in context. Responses to these issues are may be achieved through the actions of territorial authorities or local community groups with support from the regional council.

3.3.2 *Heritage*

3.3.2.1 The expansion of the dairy industry and other economic developments in the region are resulting in loss of rural heritage as old family farms change hands. When this happens, there is substantial scope for loss of rural heritage. The main issues are loss of 'old material', removal of old farm buildings, loss of heritage knowledge and the reporting of pre-European sites.

- 'old material' (farm machinery, horse tack, tools) may be disposed of inappropriately or appear in such a quantity that existing storage facilities are overwhelmed;
- the tendency for commercially driven farm developments to start with a 'clean slate' means that old farm buildings are being removed, often with unknown effects in terms of lost rural heritage;
- as family farms are sold, people that have lived in an area for several generations move away and the stories of what has happened on the land, the knowledge of the significance of historic buildings or locations of significant sites is lost;
- dairy conversions involve activities such as gravel extraction and building of structures and infrastructure that may uncover pre-European sites.[80] The persons undertaking these activities face strong dis-incentives to report such sites as the interference or cessation of works may be very costly.

3.3.2.2 The loss of rural heritage relates to changing land use and a lack of knowledge. Changing land use leads to disturbance or loss of physical heritage and the associated movement of people results in a loss of oral history. There is a lack of knowledge of old material and values of farm structures that are being lost and knowledge of the locations or significance of heritage sites may also be lost as people move away.

3.3.2.3 Once heritage is destroyed or disrupted it cannot be recovered, and even where legal protections exist, it cannot bring back what has already been lost. The economic development and movement of people now occurring in the region is a threat to rural heritage as old material and buildings, and knowledge of heritage sites and local history is lost. This lack of knowledge in understanding the significance of rural heritage is an issue as unknown aspects of rural heritage

[80] Phone Interview with Jim Geddes (Gore Regional Council) 17-10-2008

cannot be protected. This will require attention during the review process of the current Regional Policy Statement.

3.3.3 ***Peri-Urban Expansion***

3.3.3.1 Subdivision for residential or rural-residential purposes has occurred on the periphery of most urban areas of the Region either because there is a shortage of land zoned for residential purposes (for example, Gore) or for lifestyle reasons (for example, Riverton). Particularly strong pressure from developers is present on the edges of Invercargill and Te Anau.

3.3.3.2 Peri-urban expansion can result in the loss of versatile of productive soils suitable for agricultural use, degradation of and inefficiencies in the transport network, reverse sensitivity issues and degradation of landscape and other amenity values

3.3.3.3 *Inefficient and Unsustainable use of Resources*

3.3.3.3.1 It appears that peri-urban expansion is in some cases resulting in inefficient and unsustainable use of resources.

3.3.3.3.2 Infrastructure servicing difficulties can arise, with connections being sought to systems with little or no spare capacity to serve areas outside of their design locality (as has occurred on the periphery of Invercargill). Problems also occur where lot size and soil conditions result in sewage disposal methods being found to be inadequate several years after development has occurred.

3.3.3.3.3 There have been instances where residential subdivision has occurred in more isolated rural areas of the Southland District. There are a number of resource management issues associated with this type of development including transportation, wastewater disposal and rural amenity issues. In some cases concerns from adjacent established rural land uses can also arise. Another issue and one that is important in terms of rural land issues is that land that previously formed part of a larger production can be fragmented and lost from production.

3.3.3.3.4 In both Invercargill and Gore there is an adequate supply of suitable land and associated infrastructure to support ongoing urban expansion. The difficulty is however that this is not in the areas of demand. Further, some of the areas of high demand are also susceptible to inundation.

3.3.3.3.5 The townships of Te Anau, Riverton and Winton in the Southland District have all experienced relatively high levels of growth in recent years. As a result of this there has been an increasing trend for residential subdivision development often on rural farm land adjoining these townships. This has led in some instances to a loss of productive rural land or impacts on rural landscapes. In the case of Te Anau there is now considerable scope for new residential dwellings on newly created sections directly adjacent to the township. As such there is scope for the urban area of this town to be consolidated rather than allowing new subdivisions to spread out further into rural areas.

3.3.3.4 *Reverse Sensitivity*

3.3.3.4.1 The Southland District's Rural Resource Areas are rural landscapes with farming activities and rural land management practices the dominant landuse. There is potential for reverse sensitivity issues to arise in these resource areas particularly through the development of rural/residential 'lifestyle' properties in working rural landscapes. Odour and noise issues, the erection and use of farm buildings and structures and the operation of machinery could all potentially give rise to nuisance complaints.

3.3.3.5 *Per-urban Expansion and Landscapes*

3.3.3.5.1 Another issue associated with residential development in rural areas is the effect that these subdivisions can have on rural landscapes. The visual impact of rural/residential lifestyle developments can be particularly noticeable in the District's Coastal, Scenic and Transitional Resource Areas. These resource areas are often characterised by prominent rural landscapes and the formation of new dwellings, garages, access roads, lighting and amenity plantings associated with new residential subdivisions can have a significant impact on rural landscapes. This issue has been discussed further in the Landscape Issues and Options paper.

3.3.3.6 *Legislation*

3.3.3.6.1 Although there is currently little guidance in the regional or district planning documents of Southland regarding sustainable peri-urban expansion, the inappropriateness of subdivision developments that result in land being lost from production is recognised in case law[81] and the RMA.

3.3.3.6.2 In the Southland District Plan, Rule PRA.3 – 'Residential Activities' provides for one new dwelling not closer than 150 metres to any existing or proposed dwelling. An additional dwelling for accommodating staff is allowed provided that the new dwelling is located on the same certificate of title and shares the same access roads as the original house.

3.3.3.6.3 One issue with the 150 metre density rule of the existing District Plan is that it can be perceived as operating on a first come first serve basis. Resource consent approval for new dwellings or the establishment of building platforms in subdivision resource consents can affect the ability of other landowners to undertake similar development in the future. For example an approved building platform located in close proximity to a property boundary may have an influence on where a new residence or building platform can be located on the neighbouring property. If a building platform can not be established on the neighbouring

81 'Fragmentation of highly versatile land of high quality soil in a relatively large holding, would be contrary to ss 5(2)(a) and 5 (2)(b) of the RMA. Subdivision for rural-residential development would reduce the versatility of the land and prevent the development of productive use of the potential of the soil resource to provide for the needs of future generations. See para 26, Gentry vs Waikato DC A118/99, 5 NZED 29.'

property more than 150 metres from an existing building platform then resource consent is required. There are a number of ways of controlling density including the use of minimum lot sizes and also through the use of approaches such as 'cluster zoning'. These alternative forms of density control are explained and discussed further in the options section of this paper. The second part of this existing rule is generating large number of applications through the requirement to obtain resource consent for additional workers' dwellings. This is mainly occurring as the additional dwellings often cannot share the same access as the existing dwelling.

3.3.3.6.4 In the Southland District Plan, the Scenic Resource Area includes Rule SRA.1 'Buildings and Structures' which requires resource consent as a controlled activity for buildings and structures within this Resource Area. This rule has been introduced as a measure to control the effect of buildings and structures on a recognised landscape of high visual amenity. Landscape issues now have an enhanced status as a result of recent changes to the RMA. There is now a need for increased identification and protection of outstanding landscapes and natural features within the Southland District.

3.3.3.6.5 As noted above urbanisation and domestication of peri-urban areas results in adverse effects, including loss of rural amenity values and loss of productive soils, as well as inefficiencies in the transport network and difficulties arising from the disposal of sewage and effects on landscapes. Peri-urban expansion will require consideration during the review process of the current Regional Policy Statement and the development of the second generation Southland District Plan.

3.3.4 **Gravel Extraction**

3.3.4.1 The existing District Plan permits a certain amount of gravel extraction with 1,000 m^3 over a 12-month period permitted, provided that the total amount extracted over any time period does not exceed 3,000 m^3. The amount of gravel extraction occurring within the District has increased significantly in recent years. This trend can be linked to changes in patterns of landuse and in particular an increase in the number of dairy farms in the District. Large amounts of gravel are often needed for dairy farm conversions and for most conversions the amount required sits well outside the limits of this rule.

3.3.5 **Mineral Extraction**

3.3.5.1 Commercial mining activity is occurring at several sites within the Southland District. Potentially mining activity can give rise to a number of issues including but not limited to landscape, transportation, and noise and dust issues. It is important to note that most mine operations however are managed in a manner that avoids these issues arising.

3.3.5.2 The Southland Region has the most extensive coal resource in New Zealand, which includes large lignite resources and approximately 72% of New Zealand's recoverable coal resource. If large scale development of Southland's lignite

reserves occurs in the future there are likely to be a number of resource management issues that would need to be addressed at the resource consent processing stage. It is therefore important that the second generation District Plan identifies the potential environmental effects of mining activity so that they can be adequately addressed when resource consent applications are received. Mining activity is a discretionary activity in the existing District Plan and this would be an appropriate approach for use in the new District Plan.

4.0 Options for Addressing Issues

4.1 Regulations

4.1.1 The purpose of regulations is to prevent adverse effects by controlling activities that are identified as having potential environmental risks. Regulations are imposed through the development of Resource Management Plans. Regulations may be enforced through consent conditions or through the activities of compliance officers.

4.1.2 Regulations may control factors such as:

- the circumstances under which contaminants can be discharged to land, water or air;
- the proximity of discharges to waterbodies;
- the quantity or rate of discharge;
- the rate or annual amount of abstraction from a water body;
- monitoring requirements;
- information or verification of the level of a adverse effect from a given activity;
- effects of activities in, on, near or over the beds of lakes, rivers and wetlands;
- alterations to flows or water levels;
- the circumstances under which gravel, minerals or accumulated sediments can be removed;
- the effects of vegetation clearance or disturbance of the ground;

4.1.3 The advantages of regulations are that they provide a basic level of protection and assure members of the public that the values of soils and waterways are protected from the adverse effects of land activities.

4.1.4 The limitation of regulations is that they must be enforced, which has a cost, both in terms of resources spent ensuring compliance and costs to resource users. There may also be limitations in terms of the actual enforceability or practical effectiveness of regulations that are imposed. Furthermore, there are some activities that are inherently difficult to control through regulation as compliance with the regulation is either difficult to verify or involves factors that are not completely within the control of resource users.

4.1.5 ***Regulations: Focussed Land Use Controls***

4.1.5.1 The District Councils believe that the Regional Policy Statement review creates an opportunity to support District Councils in achieving sustainable land development.

4.1.5.2 One way to achieve this might be focused land use controls (i.e. controls focused at the local level) imposed through the Regional Policy Statement. These would take the form of criteria or restrictions that must be applied in certain circumstances or in certain areas. Focussed Land Use Controls that could be considered include:

- all subdivision requires resource consent approval, and as a consequence District Plans have a mandate to set out policy and rule frameworks to guide decision making on the appropriateness of approving any particular subdivision. A Regional Policy Statement imposed framework would be useful in supporting District Councils in ensuring that subdivisions are sustainable. Provisions could include:
  - restrictions on urbanisation and domestication on certain soil types
  - restrictions on the subdivision of land prone to inundation or susceptible to sea level rise or storm surge.
  - excluding small lot subdivision from areas of high landscape value
  - encouraging developments that facilitate ongoing productive use of the soil resource, 'clustering' developments for example;
  - controls on subdivision in coastal areas.

- the exclusion of some activities on particularly sensitive land. For example, controls requiring the retirement of erosion prone land or exclusion of some activities (e.g. commercial forestry) from steep or unstable land. Where retirement of land takes place, land purchase of economic incentives may also be appropriate;

- regulation through District and Regional plans may be necessary to exclude forestry from particular areas, for example, significant scenic landscapes, sites of archaeological, heritage or cultural value and sensitive ecological values;

- controls can also apply to particular activities such as gravel removal, mining or quarrying. In some cases co-location of activities by more than one consent holder (such as gravel removal) may be justified to avoid adverse cumulative effects in sensitive areas;

- there is a specific need for improved protection for indigenous vegetation. The current framework is very permissive and there is

a lack of regulation or guidance for those who wish to undertake clearance or modification of areas of indigenous vegetation. This creates vulnerabilities for wetlands on private land as there is no legal barrier to clearance of vegetation on wetland areas, after which the area ceases to be a wetland and can be drained for development into productive land;

- there is also a need for some regulatory control relating to farm buildings and other structures in the resource areas of the District where outstanding landscapes and natural features have been identified.

4.1.6 ***Regulations and the Southland District Plan***

4.1.6.1 *Reverse Sensitivity Issues*

4.1.6.1.1 It is important that the second generation District Plan recognises and clarifies clearly that rural landuse and related farming activity are appropriate activities in the Rural Resource Area. The potential for reverse sensitivity issues to arise could then be identified and addressed when resource consents for residential development proposals in rural areas are assessed under the new Plan.

4.1.6.1.2 As an example, subdivision applications for rural/residential development located in close proximity to existing rural landuse activities such as wintering pads or silage pits could potentially give rise to nuisance complaints in the future. Identification of this issue at the resource consent processing stage could help ensure that potential reverse sensitivity issues are avoided. This could involve locating the building platforms of the subdivision in an amended position away from the neighbouring landuse or other mitigation measures. In some extreme cases where mitigation measures cannot adequately avoid the potential for reverse sensitivity issues to arise it may be appropriate to refuse the subdivision application.

4.1.6.2 *Landscape Issues - Providing for Rural Activities in the CRA*

4.1.6.2.1 One of the key findings of the 'Southland Coastal Landscape Study 2006' was that the landscape character of the Coastal Resource Area (CRA) could be preserved by maintaining existing patterns of agriculture in coastal areas of the District. Retaining a viable farming community was viewed as essential in the findings of this study. Viable rural activity in the CRA lessens the likelihood of coastal areas being developed for other uses such as residential housing.

4.1.6.2.2 The second generation District Plan could recognise the importance of rural landuse activity in terms of its influence on the District's prominent landscapes. This could include the rural landscapes in the Coastal, Scenic and Mountain Resource Areas. Policies could be adopted that recognise the important role rural activity can play in preserving these landscapes and look to encourage the ongoing viability of rural activity in these areas.

4.1.7 *Rural Amenity and Performance Standards*

4.1.7.1 The existing District Plan details a number of performance standards that new buildings and structures need to adhere to. These standards include height and yard limits among other standards and are designed to ensure that any activity undertaken in a Rural Resource Area does not breach minimum environmental standards. Similar performance standards are likely to be required for incorporation within the second generation District Plan. There may also be a need to introduce new standards. One issue that has arisen recently relates to the impact on residential amenity from the construction of new dairy sheds near existing residences. There are currently no minimum set back distances for the construction of new dairy sheds. There have been instances where new sheds have been located near existing residences and odour and noise issues have arisen. A minimum setback distance from existing residences for these types of buildings may be appropriate.

4.1.8 *Approaches for Controlling Rural Density*

4.1.8.1 There is a specific need to include some form of density control on development in the Rural Resource Area through the second generation Southland District Plan. Density controls are necessary to:

- preserve and protect rural amenity and the District's rural landscapes;
- ensure that the unique rural character of the Rural Resource Areas is retained;
- help control residential development in the rural fringes of the Districts urban areas; and
- ensure that rural land is not fragmented into smaller properties which can have implications for their ongoing viability and use as productive farmland.

4.1.8.2 There are a number of ways that density controls could work. Options that have been developed include:

(a) Option 1: Separation Distances (the existing approach)

(i) The first option is to retain the framework imposed through the first generation District Plan. The existing approach involves the use of 150 metre separation distance between residential dwellings. This rule could be altered for example through the altering of the 150 metre distance requirement or through a more enabling approach to the provision of farm workers' accommodation in the second generation District Plan.

(ii) The limitation with this approach is that it has been observed to result in an even scattering of houses across what was formerly farmland,

with undesirable consequences in terms of reduced productive use of the land, degraded landscape and amenity values and dispersed wastewater disposal systems.

(b) Option 2: Minimum lot sizes

(i) Another option is the use of minimum lot sizes which the Council could consider for use in the second generation District Plan. The use of minimum lot sizes for controlling rural density is utilised by many District Councils throughout New Zealand. The Invercargill City Council currently uses a 2ha density requirement in its District Plan. It is worth noting here that there will be similar difficulties administering rules to those described in option 1. With either approach there is likely to be development that pushes the density rule to its limit.

(c) Option 3: Zoning rural areas for higher density development

(i) A third option is the definition or establishment of specific rural areas to cater for higher density rural/residential lifestyle development. Demand for rural/residential lifestyle blocks varies throughout the District with the three largest urban areas Te Anau, Riverton and Winton and rural areas of the District located in close proximity to Invercargill a focus of demand. The establishment of resource areas or zones in these areas could cater for this type of development while more stringent density requirements could be adopted for other parts of the District in order to discourage 'lifestyle' development. This could help ensure that high value soils elsewhere in the District are retained as productive farmland. If this approach was adopted, however, it would need to allow for existing natural hazards, for example flooding is an issue on the periphery of Winton and it would be inappropriate to direct more intensive rural-residential developments into this area through the use of zoning techniques.

(ii) One issue with this approach is that productive soils located in close proximity to urban areas may be lost. Another issue is that urban consolidation within areas such as Te Anau, Riverton and Winton has been identified as one way of dealing with urban growth issues. Thus, allowing for higher density lifestyle development on the urban fringes of these towns may well in the long term discourage urban consolidation and may be counter productive.

(d) Option 4: Clustering

(i) A fourth option is to provide for 'cluster zoning' or 'village' type developments in the second generation District Plan. 'Cluster zoning' is a mechanism whereby development is clustered on a large site which provides for the provision of open space on the majority of the site.

This approach can involve the utilisation of covenants on the 'remainder' of the site to preserve open space and rural landuse.

(ii) Providing for higher density groupings of dwellings in rural areas could help address a number of issues associated with the density and design of rural/residential development. Advantages of clustering include:

- when subdivision of larger rural properties is proposed, larger areas of the property may be able to remain in productive use;
- it can provide opportunities to address some of the environmental effects of non reticulation as more efficient servicing of the site may be possible;
- 'clusters' or 'villages' could also provide better public transportation opportunities, particularly where they are located on the fringe of existing urban areas;
- Potential to address landscape issues with the potential for clusters of housing to be directed away from outstanding landscapes and natural features which may be present in some rural areas;

4.1.9 ***Regulations on Gravel Extraction***

4.1.9.1 As gravel extraction on a larger scale can have significant environmental effects a rule setting a limit on the amount that can be taken as of right should again be included in the second generation District Plan. The level of material provided for in this rule however, could potentially be modified to increase the permitted baseline level. This new limit could be subject to compliance with a set of performance criteria designed to limit the effects of gravel extraction. This could enable the Council to streamline processes somewhat, with fewer resource consent applications being required.

4.1.9.2 One of the reasons for Rule PRA.4 is to allow farmers to meet the gravel extraction needs of their farms from gravel deposits on their own property. Allowing for a certain level of gravel extraction as of right would be appropriate in the second generation District Plan. The use of a rule with a trigger point whereby gravel extraction on a larger scale requires resource consent would enable the potential environmental effects of these activities to be adequately addressed.

4.1.10 ***Signage***

4.1.10.1 The signage rules of the existing District Plan relating to Rural Resource Areas could be re-examined to ensure that they are not overly restrictive and adequately provide for a range of activities. Signage performance standards that provide more clarity and flexibility could be included in the second generation District Plan.

4.1.11 ***Wording and Clarity of Existing Rules***

4.1.11.1 There is a need to clarify the wording and meaning of a number of the rules of the existing Southland District Plan which relate to rural areas. Some of these rules can be broadly interpreted and fuller explanations of their intent and meaning could help clarify their purpose. Added to this, a number of activities covered by these rules are listed as controlled activities and a change to discretionary activity status may be appropriate. A number of non-rural activities listed under Rule PRA.2 – 'Rural Activities' are controlled. While in many instances these non-rural activities are likely to be appropriate for rural locations there may be cases where due to particular circumstances they are not. Discretionary activity status would therefore be more appropriate as this would allow Council more discretion when specific issues or problems arise. Currently under controlled activity status the Council can request changes and amendments but cannot refuse these applications. Further clarification on the activities that are covered by this rule would also beneficial as there are certain activities for example transportation businesses that may require closer scrutiny through a discretionary resource consent process.

4.2 Research

4.2.1 Research and investigations are required to establish the scope and effect of activities being carried out and to develop best management practices that can be shown to achieve improved environmental results. Research has been found to be useful by both the regional and district councils.

4.2.2 Research and investigations have been used to improve knowledge and understanding of sustainable land use practices. Innovations such as nutrient budgets, improved tillage methods and tramlining have all been developed through a research process. Given the effectiveness of research partnerships formed in the past (The Topoclimate project for example), links between research agencies, statutory bodies and land managers need strengthening to enable better information flows.

4.2.3 The 'Southland Coastal Landscape Study 2006' and the 'Te Anau Basin Growth Planning Landscape Capacity Study 2006' are two examples of research that have focussed on particular rural landscape issues.

4.2.4 The protection of landscapes and natural features from inappropriate use, development and subdivision is likely to require the mapping and identification of these areas.

4.2.5 The second generation Southland District Plan could also look to map and identify the high value soils and the productive rural areas of the District. Existing studies for example Venture Southlands Topo-climate work and other similar studies could be used as an information reference for this mapping. The mapping of these areas could be used in the new District Plan as an information resource only. Alternatively the base information and maps could be used to develop a rules based approach in which certain activities, for example higher density residential subdivision are restricted on these soils.

4.3 Education, guidance and advice

4.3.1 In a resource management context, the purpose of guidelines, education and advice is to explain what environmentally appropriate practice is and how it is best achieved. The result is that all involved are made aware of expected standards of practice, so that they may act to achieve them.

4.3.2 Environment Southland provides education, guidance and advice on a wide variety of land/rural issues and industry bodies such as DairyNZ and The New Zealand Forest Owners Association provide written guidance material and extension services.

4.3.3 In the Southland region, there are a variety of land use activities that are difficult to manage using regulatory approaches and well designed guidelines and education programmes are necessary to achieve behavioural change. Education and guidelines might be used to:

- to ensure knowledge of sustainable land use practices is conveyed to land managers in a form that is relevant and that they can use. The publication 'Soil Quality on Southland Cropping Farms: A guide to monitoring and best management practices."[82] provides descriptions of practices that can maintain and enhance the soil resource during arable cropping activities;
- demonstrate how activities that disturb the ground should be carried out, tillage methods or winter grazing activities for example;
- ensure that resource users are aware of their pest control responsibilities as well as being able to identify exclusion or extermination pests so that they can report their presence to Environment Southland;
- promote techniques for managing riparian and near stream areas.[83] Guidelines might provide resource users with guidance and direction with activities such as construction of farm lanes and crossings, management of stock near rivers or wetlands and protection of ephemeral streams during winter grazing activities;
- indicate the ways in which residential development can be designed to fit with the local environment. In coastal areas for example, this could include compatible building locations, design, finished materials and colours.

4.3.4 Environment Southland have found seminars, farm visits and other field trips as effective ways to focus on particular issues and can help engage local communities. As an example community groups can often be formed in response to particular rural land issues.

82 Beare, M. and Tregurtha, C. (2004) Soil Quality on Southland Cropping Farms: A guide to monitoring and best management practices. New Zealand Institute for Crop and Food Research Limited

83 Guidelines for grazing stock adjacent to watercourses. Parts 1-4 (2002) A publication prepared by Environment Southland, Federated Farmers of New Zealand (Inc) and Fish and Game New Zealand (Southland Region)

4.3.5 Environment Southland has produced best management practice guidelines on topics such as farm dairy effluent management, the construction of culverts and farm lanes and the management of stock near waterways. Guidelines have been found to be an effective way of clarifying expectations of behaviour, both for resource users and council staff.

4.3.6 The Southland District Council currently has two non-regulatory development guideline booklets with one relating to the Riverton/Aparima Township and area (2005) and another relating to the Te Anau Ward (2003). These guidelines focus on specific characteristics of each of these communities and provide design guidance and information on issues that are of particular concern to each township. Similar guidelines could be developed that relate to rural issues for example gravel extraction or rural landscape issues.

4.3.7 The Southland District Council already has a number of information packs that act as background information resources and provide guidance for certain activities in Rural Resource Areas. These include information packs relating to dairying, gravel extraction, subdivision and a landuse pack. The purpose of the packs is to provide all the relevant District Council information relating to the different approvals that are normally required for these activities.

4.4 Codes of Practice and Accords

4.4.1 Where statutory agencies reach agreement with industry sectors on management practices they can be formalised as Codes of Practice or Accords that are voluntarily adopted for use by members.

4.4.2 An example of an effective application of guidelines is the "New Zealand Environmental Code of Practice for Plantation Forestry".[84] The Code sets out beneficial environmental practices that when adopted can minimise and enhance the environmental impacts of forestry activities, from the time of planting to harvest and replanting. This code of practice is reported as having high levels of compliance within the forestry sector.

4.4.3 The Dairying and Clean Streams Accord[85] is an accord between various groups of resource users and local government. This accord provides for fencing off of streams, bridging of stock crossings and adoption of tools such as nutrient budgets that prevent contamination from riparian and near stream areas. Although criticised[86], this accord has resulted in some improved environmental results at the national level that would have been difficult to achieve through an RMA approach.

84 Dairying and Declining Water Quality: ibid

85 Dairying and Clean Streams Accord (2003). Dairying and Clean Streams Accord between Fonterra Cooperative Group, Regional Councils, Ministry for Environment and Ministry of Agriculture and Forestry, May 2003. [Online] Available: http[://mfe.govt.nz/issues/land/rural/dairying-accord-may03.pdf [2006, December 15]

86 Dairying and Declining Water Quality: Why has the Dairying and Clean Streams Accord not delivered cleaner streams? Neil Deans: Fish & Game New Zealand Kevin Hack well: Forest & Bird

4.4.4 Currently Environment Southland is assisting with the development of a code of practice intended to achieve consistency in standards of construction for agricultural storage ponds. It is believed that the adoption of a code of practice with in-built procedures to ensure accountability and responsible practice will achieve effective environmental protection at a much lower cost than could be achieved through regulation and compliance by Environment Southland.

4.5 Monitoring and Investigation

4.5.1 The purpose of monitoring and investigation is to assess the state of a resource and to detect changes occurring over time.

4.5.2 Environment Southland undertakes a range of monitoring activities, including monitoring of water quality and water levels in surface water and groundwater. Monitoring of pest plants and animals is necessary to prevent these organisms creating a menace and to prevent the invasion of new organisms. Air quality is monitored to establish the need for regulation on emissions.

4.5.3 Monitoring may be necessary to detect contamination that is occurring but is as yet unknown[87]. For example, application of phosphate fertiliser is thought to have resulted in accumulation of cadmium and fluorine to unacceptable levels on some farms in the Waikato and monitoring may be required to assess whether the same is happening in Southland.

4.6 Advocacy

4.6.1 In some situations it may be appropriate for suppliers of products to act to prevent effects during their use. For example fertiliser companies can act to source phosphate rock with low levels of cadmium and fluorine and agrichemical suppliers are in a position to distribute information on proper disposal of agrichemical containers.

4.6.2 It may also be appropriate for Regional Councils to advocate to Central Government, for example for it to take a greater fiscal responsibility for the management of pest plants and pest animals on Crown land.

4.7 Community Initiatives

4.7.1 Integrated Catchment Management[88] involves creating collective community responsibility for stream health, with the focus of action on activities in riparian

87 Risk, J. (2008) Cadmium in Southland. Report to Council

88 Integrated Catchment Management (ICM) is a process whereby communities are engaged to take collective responsibility for environmental effects and stream health in the catchment where they live. ICM works through a process of community engagement, applying technical knowledge and integration with local government policy objectives. See 'Integrated Catchment Management Integrated Catchment Management: Learning from the Australian Experience for the Murray-Darling Basin.' Final Report. January 2002 Jennifer Bellamy, Helen Ross, Sarah Ewing, Tony Meppem CSIRO Sustainable Ecosystems, Brisbane. University of Queensland, Gatton. University of Melbourne, Melbourne

and near stream areas. The Living Streams Project is an integrated catchment management is being undertaken in the Waihopai catchment where it shows some promise of achieving an improvement in water quality at the whole catchment level.

4.7.2 The Living Streams project has enjoyed good participation and support from drystock farmers, a group of people who have been identified as very familiar with the region and are interested in community based initiatives.[89]

4.7.3 Other community initiatives such as the work of the Aparima Pest Busters illustrate how a community driven response can manage pests on Crown land.

4.8 Assistance

4.8.1 In some situations it may be appropriate for Environment Southland or Southland District Council to provide assistance to members of the public or community groups, for example, by providing funds for activities such as fencing waterways and heritage protection.

4.8.2 Once stock are excluded from a wetland, wetland plants may once again grow, with associated improvements in water quality, stability of wetland edges and sediment retention. Money to assist landowners with the cost of fencing may be available from the territorial authorities and Environment Southland. National land protection agencies such as the Nature Heritage Fund or the Queen Elizabeth II Trust may also have funding.

4.8.3 Community organisations exist[90] that undertake a variety of heritage-related work, ranging from investigations and research to maintaining collections or holding events where interested community members are able to interact with and learn about heritage values. Support received by these organisations so far has been much appreciated and resulted in substantial work being done for the little that was received. For example the Southland Oral History Project[91] has resulted in the collection of substantial information on the history and stories of the region.

4.9 Economic Instruments

4.9.1 An economic instrument is simply a financial incentive for behavioural change. This may be positive as in when rates relief is provided in exchange for protecting areas of wetlands or upland vegetation, or negative as when financial penalties

89 Simpson, J. (2000) Changing Land Use and the Effects on Community: A Case Study of the Central Southland Area.

90 Organizations that maintain collections include the Catlins Historical Society Inc (Owaka Museum), the Edendale Vintage Machinery Club, the Rakiura Museum, the Southland Shafts and Wheels Society (Inc.), the Southland Stationary Engine Club, and the Awarua Communications Museum [online] ruralheritagesouthland.co.nz

91 The Southland Oral history project has resulted in the recording of 100 interviews and training of 12 oral historians around the region. The digital recordings will be stored at the Invercargill City Council Archives. [online] ruralheritagesouthland.co.nz

prevent a certain behaviour. The scope and effectiveness of economic instruments is limited by resources available for administration and the ability to observe or measure an effect.

4.9.2 In some circumstances it may be appropriate for landowners to be paid or subsidised to carry out certain works or to protect important habitats. For example to achieve protection of areas of wetlands or indigenous vegetation in upland areas.

4.9.3 Economic instruments have been discussed as a way for forestry operators to contribute towards the public costs associated with forestry activities; how the costs associated with road upgrades should be funded and the role of rating by local authorities. Various approaches are available including the spreading of costs to landowners over a number of years or adopting a differential approach with greater payments being made at the time of harvesting, recognizing that cash flow to forestry owners occurs only at times of harvesting.

4.10 Purchase of Land

4.10.1 Purchase of land - can in some cases provide a means to ensure ecosystem services are maintained. For example territorial authorities might obtain areas of upland vegetation within municipal water catchments. Large areas of high country land have also been acquired by the Crown through the tenure review process.

4.11 Sharing of Information and Collaboration

4.11.1 There are a number of areas where sharing of information and collaboration may be the most effective and efficient method of achieving environmental outcomes. These include:

- *collaboration with forest owners* - sufficient lead time is required to upgrade roads to a standard suitable for use by heavy vehicles. Informal or regulated processes need to be in place so that Councils and forestry owners share information on the timing of proposed roading upgrades and harvesting programmes.

- *collaboration with tourist operators* – may be required to ensure the visitor experience of national parks is not degraded through overcrowding, nuisance or congestion.

- *negotiation with landowners* – may be the most effective means of resolving the issue of access. Fish and Game has obtained the co-operation of many land owners and occupiers in providing access to lakes and rivers for fishers and people wanting to undertake other recreational activities. In some cases the agreed route may not be on legal road or may require separation from farm activities by fencing.

- *communication and collaboration with landowners* - is necessary to develop

improved community understandings of the values of wetlands. Since many wetland areas are on private land, the support of landowners is necessary to achieve better protection of them. Some landowners will be concerned about the implications of a study of remaining areas of indigenous vegetation (future restrictions on land use) and collaboration may be of assistance in educating landowners and in undertaking long term plans for these areas.

5.0 Questions for Discussion

1. Do we have a complete list of land/rural issues in Southland?

2. In your view, which of the issues discussed in this paper have priority in terms of action by local government? Why?

3. How can we better respond to the issue of intensification of land use and land use change?

4. What is the role of central government in resolving land/rural issues in Southland?

5. How can the RPS assist district councils in achieving sustainable development of the land resources of the region?

6. What is an appropriate control on rural density? What are the advantages and disadvantages of the following options:

   (a) continue with the current approach, a 150m separation requirement;
   (b) use minimum lot sizes as a distance control;
   (c) impose zoning regulations that define certain areas for intensive rural development;
   (d) enable 'clustered' developments that set aside certain areas of farms for housing development, but leave the rest of the land in production under a covenant.

7. Should Southland District Council examine options for the protection of high value soils and productive land on the rural/urban fringe?

8. Should more isolated rural areas of the district be protected from rural/residential lifestyle development?

9. Should Southland District Council act to identify and map high quality soil types and recognise which landuses are best suited to these soils?

10. What approach should the Southland District Council take to the increased levels of gravel extraction that have taken place in recent years?

11. How can we create a sensible alignment of RPS, RMA and national policy that will enable us to protect remaining areas of indigenous vegetation?

What is the role of non-regulatory tools such as integrated catchment management, economic instruments, codes of practice and guidelines in addressing regionally significant issues?

Appendix 1: Analysis of Existing Regional Policy Statement Issues

1.1 Chapter 6. Rivers Lakes and Wetlands

1.1.1 Issue 6.1

The intrinsic values of water bodies and wetlands require protection and better understanding if they are to be retained for future generations.

Refer to Objectives 4.1, 5.1, 6.1; Policies 4.8, 6.1, 6.4, 6.6; Methods 6.1 - 6.4, 6.6, 6.8, 6.10, 6.12 6.13, 6.17

1.1.2 Issue 6.1 and the lack of protection and understanding of the intrinsic values of water bodies and wetlands remains an issue of concern in the Southland Region. The intrinsic values of water bodies refers to any values of water bodies that the community (both local and national) expect to be retained and responsibly managed so that they may be enjoyed for current and future generations. Intrinsic values may include:

- the mauri (spiritual essence or life force) of water;
- supporting recreation (swimming, duck hunting, fishing, walking, tramping or boating activities);
- supporting human health through reliable supply of good quality water;
- maintaining primary production (through dairy shed operations, stockwater or irrigation);
- supporting processing of primary products or other industries;
- maintaining the ecological health of water bodies. [92]

1.1.3 To preserve the intrinsic values of water bodies, flows and water levels of a certain quality and quantity must be maintained. Factors or activities that can affect the intrinsic values of water bodies include discharges from urban areas or industrial activities, discharges from installed subsurface drains or land runoff, lack of riparian vegetation, abstraction of water and in-stream activities such as damming and gravel extraction and natural variation in ecological flows and water levels.

1.1.4 There is a range of evidence that the loss of wetlands and areas of alpine vegetation important to ecological flows and stream health continues throughout Southland.[93] Local authorities and government agencies in Southland in recent years have sought to increase public awareness of the importance of wetlands and the risks they face, the success of these initiatives is unknown. What is also unknown is the location, size and conditions of wetlands in Southland. While the Department of Conservation has undertaken a national wetland resource inventory (WERI) of the Crown estate little is known about wetlands on private land. [94] Lack of knowledge and statutory protection is a major risk to wetlands, for without formal protection

[92] Adapted from The Proposed Regional Water Plan for Southland (2008) Water Issues p1.

[93] Mark A. F. and Dickinson, K. J. M. (2008) Maximizing water yield with indigenous non-forest vegetation: a New Zealand Perspective. *Front Ecol Environ* 2008; 6(1): 25-34

[94] Consultation with Southland representatives of the Department of Conservation, August 2008

there is no guarantee that the wetlands will not be drained or managed inappropriately.

1.1.5 Clearance of wetlands and other indigenous vegetation is being carried out even where the resulting land might not be able to be farmed sustainably; where there is a limited growing season or where the proximity to the coast means that inundation is very likely. The preservation of wetlands, lakes and rivers and their protection from inappropriate development is identified as a matter of national importance in Section 6(a) of the RMA.

1.2 Objectives Relevant to Issue 6.1

1.2.1 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.

1.2.1.1 Objective 4.1 is relevant to Issue 6.1 because it addresses the need to sustain the values of the Region's water resources to meet the needs of future generations. The Region's water resources must be sustained to ensure the social, economic and cultural well-being of local communities, the region and the nation.

1.2.2 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.

1.2.2.1 Objective 5.1 addresses the protection and sustainability aspects of Issue 6.1. Water must be of good quality to provide for future generations, while protecting the ecological values of lakes, rivers and wetlands.

1.2.3 Objective 6.1

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

1.2.3.1 Objective 6.1 appears consistent with both the wording and intent of Issue 6.1. Objective 6.1 gives support to Issue 6.1 by defining protection of the values of lakes, rivers and wetlands as a goal for policy and action.

1.2.4 Objective 6.2

To recognise and provide for the relationship of Maori and their culture and traditions with lakes, rivers and wetlands.

1.2.4.1 Objective 6.2 accurately reflects Issue 6.1. The relationship of Maori and their culture and traditions with lakes, rivers and wetlands is necessary to properly understand and protect the intrinsic values of these water bodies. The explanation for Objective 6.2 calls for consultation with tangata whenua so as to better protect and understand the values of the water resource:

> '(*It is appropriate) to consult the tangata whenua, identify the values that are placed on these resources and have regard to them in determining appropriate use and development.'*

1.2.4.2 In other words in making decisions that concern the protection of the resource it is important to consult in order to gain a full understanding of intrinsic values.

1.2.5 **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.

1.2.5.1 Objective 6.4 accurately reflects Issue 6.1 because it addresses the general need to protect the intrinsic values of streams, rivers, lakes and wetlands.

1.3 **Policies Relevant to Issue 6.1**

1.3.1 **Policy 4.1**
Prepare regional plan(s) to clearly identify regimes for the management of water quantity.

1.3.1.1 Policy 4.1 is relevant to Issue 6.1 because maintaining water levels and ecological flows is a part of protecting the intrinsic values of waterbodies related to ecosystem health. The Proposed Regional Water Plan (2008) provides a rigorous effects based framework to establish ecological flows in lakes, rivers and wetlands.[95]

1.3.2 **Policy 4.8**
Support Water Conservation Orders where these will assist in achieving the objectives and policies of this Regional Policy Statement.

1.3.2.1 Policy 4.8 is relevant to Issue 6.1 because Water Conservation Orders are a part of the regulatory framework that gives protection to the values of lakes, rivers and wetlands in Southland.

1.3.3 **Policy 6.1**
Protect the following wetland ecosystems from inappropriate subdivision, use and development:
Awarua Plain - Southland Estuaries including:
Waituna Scientific Reserve
Seaward Moss
Wetlands adjoining Awarua Bay

[95] Proposed Regional Water Plan for Southland. Appendix I: Methods for Determining Ecological Flows and Water Levels.

Wetlands adjoining Bluff Harbour
New River Estuary
Fortrose Harbour (including lower Mataura River)
Bayswater Bog
Big Bay - Waiuna
Borland Mire
Castle Downs (Hamilton Burn)
Drummond Peat Swamp (Isla Bank)
Fiordland National Park (World Heritage site) including:
Back Valley
Grebe Valley
Lower Hollyford
Sutherland Sound
Five Mile Swamp (wetland in ancient Lake Wakatipu lake outlet)
- *Freshwater Valley including:*
Freshwater Flats
Ruggedy Flat
The following wetlands in the Garvie Mountains
Blue Lake wetland
Gow Lake wetland
Scott Lake wetland
- *Haldane Estuary and reservoir*
- *Lake George*
Lake Vincent, near Fortrose
Lake Brunton, Otara
Mount Tennyson string bog
Redcliffe Reserve
- *So Big Swamp*
- *Silver Lagoon*
- *Table Hill*
Te Anau Basin wetland complex including:
Kepler Mire
Dome Mire - Dismal Swamp
Dunton Swamp
Tekaro Wetland
Amoeboid Swamp
Kakapo Swamp
Snowdon Forest
Dale Lake
Lake Luxmore
Lagoon Creek
- *Toetoes Flats*
Waiau River - Te Waewae Lagoon
Waikawa Estuary
- *Waimatuku wetland*
Wairaki Lagoon (Waiau River)

. *Waterloo (Aparima).*

1.3.3.1 Policy 6.1 reflects Issue 1 in that it calls for protection of certain wetlands. It is notable that many of these wetlands are administered by the Department of Conservation and are thus under the protection of central government. Initiatives by Environment Southland are currently underway to identify and record wetlands on private lands.

1.3.4 **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.

1.3.4.1 Policy 6.2 reflects Issue 6.1 in that it calls for further research and development of improved understandings of how wetlands are affected by their surrounding environment. Well developed understandings of how activities carried out near to or upstream of wetlands affect ecosystem processes within them are necessary to achieve the goal of protection outlined in Issue 6.1 and Objectives 6.1 and 6.4.

1.3.5 **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.

1.3.5.1 Policy 6.3 is highly relevant to Issue 6.1. A directive to preserve and protect the values of lakes, rivers and wetlands gives valuable support and direction to the planning process at the regional and district level. While some areas have been protected under regional and district plans, there are valuable wetland areas that have not been protected because they are not listed under Policy 6.1.

1.3.6 **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.

1.3.6.1 Policy 6.4 is consistent with and relevant to the 'knowledge' aspect of Issue 6.1. Tangata whenua values are a key part of 'intrinsic values' of the water resource and consultation is needed to achieve good quality understandings of the values of lakes, rivers and wetlands.

1.3.7 **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.

1.3.7.1 Policy 6.5 is consistent with Issue 6.1. Policy 6.5 recognises that there is a need to protect ecological and tangata whenua values from any effects that might arise as a result of access and gives effect to Section 6(d) of the RMA while highlighting that certain environmental bottom lines need to be achieved in that regard.

1.3.8 **Policy 6.6**
Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.

1.3.8.1 Policy 6.6 is consistent with Issue 6.1 in that it calls for protection of in-stream values. The explanation for this policy discusses the role of riparian management in protecting the values of lakes, rivers and wetlands from the effects of land use activities.

1.3.9 **Policy 6.7**
Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.

1.3.9.1 Policy 6.7 is consistent with the knowledge aspect of Issue 1. Whether through research, collation of existing information, or preparation of guidelines, information must be prepared to improve understanding.

1.3.10 **Policy 6.8**
Provide a water management regime for Waituna Lagoon and its catchment..

1.3.10.1 Policy 6.8 remains relevant to Issue 1. The protection of the values associated with Waituna Lagoon has not occurred through resource management processes.

1.3.10.2 In the current context, it may be useful to expand the scope of this policy to include water quality. For example: 'Policy 6.7 Provide a management regime for Waituna Lagoon and it's catchment.

(a) manage water levels to minimise damage to public roads and adjoining land.
(b) protect water quality in the lagoon.'

1.3.10.3 These changes improve Policy 6.8 by extending the scope of interest beyond to water management regime to any activity that could affect water quantity and quality or habitat values in the Waituna Lagoon and associated catchments. In the current context, rapid development is occurring in the Waituna catchment and it is necessary to address activities such as intensive agriculture, runoff to streams and drainage that are occurring.

1.3.11 **Policy 6.9**
Provide for the continued maintenance of community drains to facilitate drainage and prevent damage to community assets while avoiding, remedying or mitigating adverse effects on water quality and stream flora and fauna.

1.3.11.1 Policy 6.9 is relevant to the protection aspect of Issue 1. Community drains are maintained because of their public benefit; providing drainage and minimising damage to assets by flooding, however maintenance of community drains can result in the release of large amounts of silt and contaminants held in the stream bed. Aquatic habitat may also be damaged as in-stream water plants are removed. Since damage to ecosystem values is inevitable during drain maintenance, the only means of mitigation is to manage riparian and near-stream areas in a way that reduces the need for maintenance; by modifying land use practices to prevent periphyton growth for example.

1.3.12 **Policy 6.10**

Recognise and provide for existing structures including hydroelectric 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.

1.3.12.1 Policy 6.10 is relevant to Issue 6.1. The statement '…*avoiding wherever practicable, mitigating or remedying any adverse effects'* gives clear direction to the development of methods that protect the intrinsic vales of lakes, rivers and wetlands from the effects of hydro-electric installations and flood alleviation and river management works.

1.3.13 **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.

1.3.13.1 Policy 6.11 is relevant to Issue 6.1 because the quality and quantity of water is of central importance to the intrinsic values of lakes, rivers and wetlands. The focus of this policy is a particular aspect of these values; the supply of water to maintain human health.

1.3.14 **Policy 6.12**

Manage the Region's fluvial gravel resources in such a way as to avoid, remedy or mitigate adverse effects of gravel extraction.

1.3.14.1 Policy 6.12 is consistent with and relevant to Issue 6.1 in that it calls for practices that avoid, remedy or mitigate adverse effects of activities within the beds of rivers.

1.3.15 **Policy 6.13**

Encourage and, where practical, require lake and river vessels to dispose of sewage to a shore-based treatment disposal system.

1.3.15.1 Policy 6.13 is relevant to Issue 6.1 in that it calls for protection of an aspect of intrinsic values of the lake resource.

1.3.15.2 Over the past 12 years, public perceptions of the values of lakes and rivers and the types of activities that might degrade those values have changed and disposal of

sewage directly to lake water is no longer acceptable under any circumstances. Policy 6.13 could be modified to reflect this: 'Policy 6.13 Require lake and river vessels to dispose of sewage to a shore-based treatment disposal system.'

1.3.16 **Policy 6.14**
Promote the management of sphagnum moss in a sustainable manner that avoids long term environmental effects on wetlands.

1.3.16.1 Policy 6.14 is relevant to Issue 6.1 in that it calls for resource users to protect aspects of the wetland resource by avoiding over harvesting of sphagnum moss. This policy appears very specific and might be out of date in the current context. The harvesting of sphagnum moss is no longer a prominent activity in Southland, but it is important to consider that it might be so again as harvesting of sphagnum moss can have significant environmental effects. Removal of sphagnum moss can result in ecological effects, ground disturbance or drying out.[96]

1.4 **Issue 6.2**
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

1.4.1 Issue 6.2 remains relevant in the current context. Loss of habitat for wildlife and freshwater fish is still a relevant issue for Southland resource management.

1.4.2 Rivers and lakes in Southland are known to support a range of habitat values. With several rives providing areas of habitat for native species and trout species of international significance.

1.4.3 Wetlands support a high biodiversity because wetland habitats are often complex with different zones and different conditions. As a result, wetlands provide unique habitats for many plants and animals with 22% of native birds and 30% of native freshwater fish found in wetlands. Coastal wetlands are vital for at least part of the life cycle of more than 30 species of edible fish, including whitebait, sole, flounder and eels.

[96] From Communication with Bryan Rance. There is not a significant sphagnum moss industry currently, but it could become an issue again. The amount undertaken depends on markets and hence potential revenue. 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.

1.4.4 Pressures on habitat values of lakes, rivers and wetlands include:

- development of wetland areas into pasture;
- drainage and surface runoff associated with agricultural intensification on or near wetland boundaries;
- point source and non-point source discharges resulting from agricultural activities in riparian and near-stream areas (intensive grazing, cultivation, fertiliser applications, discharges of silage leachate and irrigation of farm dairy effluent.);
- point source discharges associated with activities in urban areas, either directly as from industrial outfalls or indirectly from stormwater;
- pressure on fish life resulting from removal of riparian vegetation, in-stream structures that impede fish passage and sedimentation;
- point source discharges associated with inappropriate disposal of sewage tank waste.

1.5 Objectives Relevant to Issue 6.2

1.5.1 Objective 6.1

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

1.5.1.1 Objective 6.1 is relevant to Issue 6.2 because the intrinsic values of water bodies extend to providing habitat for wildlife and freshwater fish. The linkage between Issue 6.2 and Objective 6.1 is illustrated in the explanation:

> '*Other values of wetlands, lakes and rivers are also worthy of protection. These include in-stream values, and values of importance to freshwater fisheries, flora and other fauna, recreational, and amenity values'*

1.5.1.2 In other words wetlands have a range of values (including ecological values) that need to be considered.

1.5.2 Objective 6.2

To recognise and provide for the relationship of Maori and their culture and traditions with lakes, rivers and wetlands.

1.5.2.1 Objective 6.2 is relevant to Issue 6.2 because the habitat values of lakes, rivers and wetlands are key to maintaining a bountiful and safe to consume food resource and thus to supporting the relationship of Maori and their culture and traditions with lakes, rivers and wetlands.

1.5.3 **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.

1.5.3.1 Objective 6.4 is relevant to issue 6.2 because a number of activities '*in, on, under, adjacent to, or over the beds of lakes, rivers and wetlands'* may have negative effects on water quality and quantity and thus the health of lakes, rivers and wetlands.

1.5.4 **Objective 13.7**

To identify and protect significant conservation values within the coastal marine area.

1.5.4.1 Objective 13.7 is relevant to Issue 6.2 because the coastal marine area supports a range of habitats of special significance, these include the tidal reaches of rivers, coastal wetlands and lagoons or estuarine habitats. The linkage between freshwater zones and the coastal marine area is particularly important because of the vulnerability of habitats within this zone to modification and the effect that this can have on populations of indigenous fish or birds.[97]

1.6 **Policies Relevant to Issue 6.2**

1.6.1 **Policy 4.4**

Encourage the conservation of water and its efficient allocation and use.

1.6.1.1 Policy 4.4 is somewhat relevant to Issue 6.2. There is some relevance in terms of the effect of water allocations on ecological flows and the effect that this can have on fish populations.

1.6.2 **Policy 6.1**

Protect the following wetland ecosystems from inappropriate subdivision, use and development:

- *Awarua Plain - Southland Estuaries including:*
  Waituna Scientific Reserve
  Seaward Moss
  Wetlands adjoining Awarua Bay
  Wetlands adjoining Bluff Harbour
  New River Estuary
  Fortrose Harbour (including lower Mataura River)
  Bayswater Bog
  Big Bay - Waiuna
  Borland Mire
  Castle Downs (Hamilton Burn)
  Drummond Peat Swamp (Isla Bank)
  Fiordland National Park (World Heritage site) including:
  Back Valley

97 Boffa Miskel (2006) S outhland Coastal Landscape Study. Prepared for Environment Southland and Southland District Council by Boffa Miskell Limited August 2006

Grebe Valley
Lower Hollyford
Sutherland Sound
- *Five Mile Swamp (wetland in ancient Lake Wakatipu lake outlet)*

Freshwater Valley including:
Freshwater Flats
Ruggedy Flat
The following wetlands in the Garvie Mountains
Blue Lake wetland
Gow Lake wetland
Scott Lake wetland
Haldane Estuary and reservoir
- *Lake George*

Lake Vincent, near Fortrose
- *Lake Brunton, Otara*

Mount Tennyson string bog
- *Redcliffe Reserve*
- *So Big Swamp*

Silver Lagoon
Table Hill
Te Anau Basin wetland complex including:
Kepler Mire
Dome Mire - Dismal Swamp
Dunton Swamp
Tekaro Wetland
Amoeboid Swamp
Kakapo Swamp
Snowdon Forest
Dale Lake
Lake Luxmore
Lagoon Creek
- *Toetoes Flats*
- *Waiau River - Te Waewae Lagoon*

Waikawa Estuary
Waimatuku wetland
Wairaki Lagoon (Waiau River)
Waterloo (Aparima).

Southland contains many wetlands of a variety of types and land status, many of which have been extensively modified and developed. The above list represents those which are of known significance and must be protected from inappropriate subdivision, use and development. Consideration of the protection of other wetlands will be by way of Regional and District Plans, or a change to this Regional Policy Statement.

Policy 6.1 is relevant to Issue 6.2, as it concerns the range or scope of wetlands that require protection from land development activities.

1.6.2.1 The wetland resource in Southland requires further clarification and mapping so that resource managers are more able to identify and act to protect wetland areas. (See discussion on policy 6.1 in Issue 6.3)

1.6.3 **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.

1.6.3.1 Policy 6.4 is relevant to Issue 6.2 because fish, shellfish and birds supported by lakes, rivers and wetlands are valued as a traditional food source.[98] It is therefore important to maintain habitat areas and to consult with local Maori as part of managing lakes, rivers and wetlands.

1.6.4 **Policy 6.6**
Enhance the water quality, amenity and instream values of lakes,rivers and wetlands and promote bank stability.

1.6.4.1 Policy 6.6 remains relevant to Issue 6.2 as in-stream values associated with quality and quantity of water are the main determinants of the health of freshwater ecosystems and therefore the quality of these areas as fish habitat.

1.6.5 **Policy 6.8**
Provide a water management regime for Waituna Lagoon and its catchment.

1.6.5.1 Policy 6.8 is somewhat relevant to Issue 6.2 because the Waituna Lagoon is an important habitat for a variety of aquatic species and birdlife. Policy 6.8 might be more relevant if reference was made to the threat of runoff of agricultural contaminants arising from land use intensification.

1.6.6 **Policy 6.9**
Provide for the continued maintenance of community drains to facilitate drainage and prevent damage to community assets while avoiding, remedying or mitigating adverse effects on water quality and stream flora and fauna.

1.6.6.1 Policy 6.9 is relevant to Issue 6.2 because the maintenance of community drains involves substantial disturbance of the bed, release of sediments and removal of aquatic plants.

1.6.6.2 Policy 6.9 might be improved by giving support to practices or management regimes that lessen the frequency with which drains require maintenance. A balance is required between clearing drains so that they work and protecting values.

98 Southland Regional Council (2008) The Cry of the People, Te Tangi a Tauri. Ngai Tahi ki Murihiku. Natural Resource and Environmental Iwi Management Plan 2008.

1.6.7 **Policy 6.10**
Recognise and provide for existing structures including hydroelectric 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.

1.6.7.1 Policy 6.10 is somewhat relevant to Issue 6.2. Hydro-electric installations can result in substantial modification of river ecosystems, both by the conversion of rivers into lakes and by the modification of flow regimes. Despite the magnitude of effects that occur, it is often difficult to mitigate the effects of hydro-electric plants that are already in place.

1.6.8 *Policy 6.12 Manage the Region's fluvial gravel resources in such a way as to avoid, remedy or mitigate adverse effects of gravel extraction.*

1.6.8.1 Gravel extraction can have effects on ecological values and the habitat values of rivers and policy 6.12 is thus relevant to issue 6.2. Gravel extraction may involve in removal of gravel bars from rivers and destruction of important breeding areas for birds. In some cases, gravel extraction can enhance habitat values, by creating wetlands adjacent to rivers for example.

1.6.9 **Policy 6.14**
Promote the management of sphagnum moss in a sustainable manner that avoids long term environmental effects on wetlands.

1.6.9.1 Policy 6.14 is no longer relevant to Issue 6.2 because there is not a significant sphagnum moss industry in Southland.

1.7 **Issue 6.3**
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 wetland is of particular concern, given its significance as a Wetland 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

1.7.1 Issue 6.3 is relevant as the loss of wetlands is an issue of increasing concern within the Southland Region. Environment Southland and Department of Conservation staff continue to report incidents of drainage, degradation, devegetation or loss of significant areas of wetlands on private lands.

1.7.2 Conversion to agriculture has been the greatest cause of the loss of wetlands. Agriculture, horticulture or forestry have all been developed with wetland areas, and areas of wetlands on farms are converted to pasture on a regular basis.

Animals grazing on wetland plants and surface pugging, increasing levels of nutrients (from animal excrement and urine and fertilizer draft, runoff or depositing into wetlands), digging of drainage ditches, the trampling or driving over of bird breeding and roosting site and fish spawning areas all contribute to a decline in ecological values and loss of habitat necessary for the survival of wetlands. Conversion of wetlands to agricultural use is primarily driven by economic motives – a desire to obtain greater returns from the land.

1.7.3 Climate Change may result in sea level rise. If that occurs, low lying wetlands will slowly drown unless they can retreat inland, keeping pace with the rate of sea level rise. Ironically, the destruction of wetlands and other indigenous ecosystems releases vast amounts of carbon dioxide, one of the greenhouse gases contributing to climate change.

1.8 Objectives Relevant to Issue 6.3

1.8.1 Objective 6.1

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

1.8.1.1 Objective 6.1 is relevant to Issue 6.3. The loss of wetlands remains a particular concern as the ability to derive capital growth from developing these areas, combined with a lack of awareness of wetland values create strong drivers for degradation or loss.

1.9 Policies Relevant to Issue 6.3

1.9.1 Policy 6.1

Protect the following wetland ecosystems from inappropriate subdivision, use and development:

Awarua Plain - Southland Estuaries including:
Waituna Scientific Reserve
Seaward Moss
Wetlands adjoining Awarua Bay
Wetlands adjoining Bluff Harbour
New River Estuary
Fortrose Harbour (including lower Mataura River)
Bayswater Bog
Big Bay - Waiuna
Borland Mire
Castle Downs (Hamilton Burn)
Drummond Peat Swamp (Isla Bank)
Fiordland National Park (World Heritage site) including:
Back Valley
Grebe Valley
Lower Hollyford
Sutherland Sound

Five Mile Swamp (wetland in ancient Lake Wakatipu lake outlet)
- *Freshwater Valley including:*
Freshwater Flats
Ruggedy Flat
The following wetlands in the Garvie Mountains
Blue Lake wetland
Gow Lake wetland
Scott Lake wetland
- *Haldane Estuary and reservoir*
- *Lake George*
Lake Vincent, near Fortrose
Lake Brunton, Otara
Mount Tennyson string bog
- *Redcliffe Reserve*
- *So Big Swamp*
Silver Lagoon
Table Hill
Te Anau Basin wetland complex including:
Kepler Mire
Dome Mire - Dismal Swamp
Dunton Swamp
Tekaro Wetland
Amoeboid Swamp
Kakapo Swamp
Snowdon Forest
Dale Lake
Lake Luxmore
Lagoon Creek
Toetoes Flats
Waiau River - Te Waewae Lagoon
Waikawa Estuary
Waimatuku wetland
- *Wairaki Lagoon (Waiau River)*
Waterloo (Aparima).

Southland contains many wetlands of a variety of types and land status, many of which have been extensively modified and developed. The above list represents those which are of known significance and must be protected from inappropriate subdivision, use and development. Consideration of the protection of other wetlands will be by way of Regional and District Plans, or a change to this Regional Policy Statement.

1.9.1.1 Policy 6.1 is relevant to Issue 6.3, however the scope of wetlands in the list is too brief to provide adequate protection. Many of the wetlands listed are administered by the Department of Conservation or are otherwise publicly owned and are not under development pressure.

1.9.1.2 The issue is lack of knowledge and thus protection of privately owned wetland areas that may be of special significance.

1.9.1.3 Policy 6.1 would be much improved by a direction to develop a detailed inventory of wetland resources in Southland. This inventory might also extend to areas of land adjacent to wetlands where drainage activity or discharge of contaminants might have effects on ecosystem health.[99]

1.9.2 **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.

1.9.2.1 Policy 6.2 is relevant to Issue 6.3. There is a need to better understand the relationships between wetlands and nearby environments, particularly in areas where geographical factors combined with intensive land use create vulnerabilities. For example the high rate of overland flow and large number of small streams makes the Waituna Catchement particularly vulnerable to effects such as runoff of phosphorous, faecal contaminants and sediments.

1.9.3 **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.

1.9.3.1 Policy 6.3 is relevant to Issue 6.3 because it directs regional and district plans to provide for the degradation and loss of water bodies, including wetlands. The role of provisions in regional and district plans is further discussed in the examination of methods later in this document.

1.9.4 **Policy 6.6**

Enhance the water quality, amenity and in-stream values of lakes, rivers and wetlands and promote bank stability.

1.9.4.1 Policy 6.6 remains a relevant to Issue 6.3. Wetland boundaries have been identified as a key area of concern by Environment Southland staff and interested groups in the region. A buffer zone is necessary to prevent infiltration of contaminants and to help maintain ecological flows and water levels within wetland areas.[100]

1.9.5 **Policy 6.7**

Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.

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99 Discussions with the Department of Conservation and with the Compliance Division of Environment Southland indicate that there is a specific need to undertake an inventory of wetland areas in Southland.

100 Walls, G. (2003) Southland Conservancy Wetland Survey 2002-2003: Ecological Survey of key wetlands for which little prior information was available in Southland and southern Otago. Contract report to Department of Conservation, Southland. December 2003.

1.9.5.1 Policy 6.7 does not appear to be relevant to Issue 6.1. Preparing and sharing information, cooperative action and research are discussed in Method 6.1.

1.9.6 **Policy 6.8**
Provide a water management regime for Waituna Lagoon and its catchment.

1.9.6.1 Policy 6.8 is somewhat relevant to Issue 6.3. This policy calls for a control regime that protects roads and low lying land near the Waituna Lagoon.

1.9.6.2 Policy 6.8 would be more relevant if the wording of the policy reflected the overall need to protect the ecological health of the Waituna Lagoon and associated catchment. (Refer to discussion of the relevance of Policy 6.8 to Issue 6.1.)

1.10 **Issue 6.4**
Many wetlands are valued by recreational enthusiasts for duck hunting, bird watching and eeling. These areas have also traditionally been used by the tangata 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

1.10.1 Issue 6.4 remains relevant in the current context as wetlands support a range of values related to recreational activities or resource gathering.

1.10.2 Wetlands are ecotourism and recreation sites. Wetlands are important recreational areas, enjoyed by many naturalists, fishermen, whitebaiters, waterfowl hunters and those engaged in other water sports. They are also growing in importance as tourist attractions because of their scenic qualities and abundant wildlife.

1.10.3 Wetlands are a cultural resource, being important for early Maori as a source of food (fish, birds, eels, pollen and roots) and plants such as flax for weaving and thatching, and moss for bedding. The waterways within and between the wetlands provided canoe routes to these resources. Some traditional use still continues, both for cultural purposes and as a source of income.

1.10.4 Ecosystem health must be maintained to a level that ensures a bountiful resource. Resource users require access so that they can undertake recreational activities or traditional activities such as food gathering.

1.10.5 Issue 6.4 might be more relevant if it explicitly identified linkages between activities that threaten ecological values of wetlands and value of these areas for recreational purposes or food or flax gathering, or the need for access so that these activities can be undertaken in the first place. For example:

> *Many wetlands are valued by recreational enthusiasts for duck hunting, bird watching and eeling. These areas have also traditionally been used by the tangata whenua as important*

resources for food and flax gathering. These values may be threatened by activities that adversely affect the ecological values of wetlands or the loss of access to these areas.

1.11 **Objectives Relevant to issue 6.4**

1.11.1 **Objective 1.2**

To recognise the importance of wahi tapu, wahi taoka, mahika kai and the customary use of water to Kai Tahu.

1.11.1.1 Objective 1.2 is relevant to issue 6.4. The status of wetlands as a site of food and flax gathering and other traditional activities as well as the role of wetlands in cleansing the environment means that wetlands are of value and importance to tangata whenua.

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 and

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

1.11.1.2 Objective 4.1 is relevant to Issue 6.4 because the quality of wetland habitat and the resources it can provide depends to a large degree on ecological flows and water levels within and around wetland areas. Ecological flows and water levels must be maintained if wetland areas are to continue to provide for the needs of future generations.

1.11.2 **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.

1.11.2.1 Objective 5.1 is relevant to Issue 6.4 because the goals of meeting the needs of future generations and safeguarding the life-supporting capacity of the water resource are consistent with maintaining the values of wetlands as a food resource.

1.11.3 **Objective 6.1**

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

1.11.3.1 Objective 6.1 is relevant to Issue 6.4 because the natural character, heritage values and outstanding natural features of wetland areas extends to the flora and fauna they support and thus the value of these areas for recreational or traditional activities that involve food gathering.

1.11.3.2 The wording of the explanation clarifies this:

> *'Other values of wetlands, lakes and rivers are also worthy of protection. These include instream values, and values of importance to freshwater fisheries, flora and other fauna...'*

1.11.4 **Objective 6.2**

To recognise and provide for the relationship of Maori and their culture and traditions with lakes, rivers and wetlands.

1.11.4.1 Objective 6.2 is relevant to Issue 6.4 because of the importance of wetlands as a food source and the linkages between the values of wetlands and tribal mana or spiritual life. Objective 6.2 is also relevant because it supports consultation with tangata whenua in matters of identifying and preserving the values of wetlands.

1.11.5 **Objective 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.

1.11.5.1 Objective 6.3 is relevant to Issue 6.4 because access is necessary if wetland areas are to be used for recreation or if tangata whenua are to successfully carry out traditional activities such as food or flax gathering within wetland areas.

1.12 **Policies Relevant to Issue 6.4**

1.12.1 **Policy 1.2**

Recognise "Te Whakatau Kaupapa O Murihiku" as a Kai Tahu resource management reference planning document for the Region.

1.12.1.1 Policy 1.2 remains marginally relevant to Issue 6.4. *"Te Whakatau Kaupapa O Murihiku"* has been superseded by 'Te Tangi a Tauri[101]' as the primary Kai Rahu reference planning document for the region.

1.12.2 **Policy 6.1**

Protect the following wetland ecosystems from inappropriate subdivision, use and development:

Awarua Plain - Southland Estuaries including:
Waituna Scientific Reserve
Seaward Moss
Wetlands adjoining Awarua Bay
Wetlands adjoining Bluff Harbour
New River Estuary
Fortrose Harbour (including lower Mataura River)

[101] Southland Regional Council (2008) The Cry of the People, Te Tangi a Tauri. Ngai Tahi ki Murihiku. Natural Resource and Environmental Iwi Management Plan 2008.

- *Bayswater Bog*
  Big Bay - Waiuna
  Borland Mire
  Castle Downs (Hamilton Burn)
- *Drummond Peat Swamp (Isla Bank)*
  Fiordland National Park (World Heritage site) including:
  Back Valley
  Grebe Valley
  Lower Hollyford
  Sutherland Sound
  Five Mile Swamp (wetland in ancient Lake Wakatipu lake outlet)
- *Freshwater Valley including:*
  Freshwater Flats
  Ruggedy Flat
  The following wetlands in the Garvie Mountains
  Blue Lake wetland
  Gow Lake wetland
  Scott Lake wetland
- *Haldane Estuary and reservoir*
- *Lake George*
  Lake Vincent, near Fortrose
  Lake Brunton, Otara
  Mount Tennyson string bog
  Redcliffe Reserve
  So Big Swamp
- *Silver Lagoon*
- *Table Hill*
- *Te Anau Basin wetland complex including:*
  Kepler Mire
  Dome Mire - Dismal Swamp
  Dunton Swamp
  Tekaro Wetland
  Amoeboid Swamp
  Kakapo Swamp
  Snowdon Forest
  Dale Lake
  Lake Luxmore
  Lagoon Creek
- *Toetoes Flats*
- *Waiau River - Te Waewae Lagoon*
- *Waikawa Estuary*
- *Waimatuku wetland*
  Wairaki Lagoon (Waiau River)
  Waterloo (Aparima).

1.12.2.1 Policy 6.1 is relevant to Issue 6.4 because it identifies some wetlands that are of value for recreation and food gathering purposes.

1.12.2.2 This list does not cover all wetland areas where recreation and food gathering activities take place, thus Policy 6.1 could be made more relevant to Issue 6.4 by providing a definition of a 'wetland' and requiring that a list of remaining wetlands be done. Refer to discussion of Policy 6.1/Issue 3.

1.12.3 **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.

1.12.3.1 Policy 6.4 is relevant to Issue 6.4 and supports Objective 6.2. Consultation assists the development of improved understandings of the values that Maori place on wetlands and wetland areas and the effects of human activities on these values.

1.13 **Issue 6.5**

In managing surface water, difficulties have arisen in balancing the needs and interactions of many parts of a complex and dynamic system. In its natural state, the system comprises hydrological components as well as habitats associated with alpine and riparian flora and fauna. The system is modified by social and cultural systems, and their associated activities, in particular, storage dams, reservoirs, stopbanks and diversions, water races, spray irrigation, border dykes, and treatment and discharge of effluent.

Refer to Objectives 6.1 – 6.4; Policies 5.1, 6.1, 6.3 – 6.7, 6.10 – 6.12; Methods 6.1 – 6.17

1.13.1 Issue 6.5 is relevant in the current context. Balancing the needs and interactions of the surface water system[102] and associated land-based systems remains a relevant resource management issue in Southland.

1.13.2 This task is becoming increasingly difficult in the face of land use changes such as clearance of native vegetation, development of rundown land, agricultural intensification, expansion of the built environment, and large scale effects associated with electricity generation or mining. Land development or intensification can affect the surface water system through construction of culverts, bridges and on-farm structures, through the discharge and run-off of contaminants

1.13.3 The built environment affects the system through discharges of stormwater, waste disposal and modifications to streams and rivers.

1.13.4 Large scale activities may have implications for surface water at the regional level. Large scale open cast mining is being proposed in Eastern Southland and hydro-electric generation is carried out in the national parks. The substantial modification

[102] In this document, the 'surface water system' refers to all surface water in the region, including lakes, rivers and wetlands, but not including groundwater.

of river beds and ecological flows that results has profound impacts on rivers, lakes and wetlands within the affected area.

1.14 **Objectives Relevant to Issue 6.5**

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

1.14.1.1 Objective 6.1 is relevant to and consistent with Issue 6.5 because of the scope of land use activities and effects on the water resource.

1.14.2 **Objective 6.2**
To recognise and provide for the relationship of Maori and their culture and traditions with lakes, rivers and wetlands.

1.14.2.1 Objective 6.2 is relevant to Issue 6.5. Modifications by social and cultural systems and their associated activities may be in conflict with tangata whenua values. Activities such as discharges of effluent or other waste directly to water and disturbance of sacred sites or burial grounds are particularly offensive to Maori cultural values.

1.14.3 **Objective 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.

1.14.3.1 Objective 6.3 is relevant to Issue 6.5 because *'access for recreation or gathering of mahinga kai'* is a component of social and cultural systems that may in turn have effects on the overall system either from the act of access or activities carried out while there.

1.14.4 **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.*

1.14.4.1 Objective 6.4 is relevant because it gives general support to addressing the problems identified in Issue 6.5. Avoiding and mitigating adverse effects is crucial to maintaining the health of the overall surface water system.

1.15 **Policies Relevant to Issue 6.5**

1.15.1 **Policy 5.1**
Review classifications for water bodies, including ground water.

Explanation
All the surface waters of the Southland region are the subject of an existing water classification system. The water quality standards for both surface and ground water supplies in the Region

must now be reassessed using new criteria, based upon the Third Schedule of the Act. This will require the establishment of water quality standards for all water bodies, or parts of those water bodies, in the Region, including interim standards where necessary. This will consider their capacity to absorb contaminants and will provide standards so that environmental effects can be assessed. The new water quality classification system will be orientated, for example Class WS Water (waters being managed for water supply purposes) or Class IA Water (being water managed for industrial abstraction). Many of the Schedule's classification standards dealing with affected parameters (positive and negative) are narrative and where possible shall be quantified.

Classification standards will represent environmental minima for a designated water use. On the basis of present knowledge, and recognising the cost of undertaking a review of water classifications the following priority order will be adopted :
- Oreti River and catchment
- Mataura River and catchment
- Aparima River and catchment
- Waiau River and catchment
- other water (ground and surface) within the region

Should any monitoring of particular areas show that a change in priorities is warranted then this can be considered.

1.15.1.1 Policy 5.1 is somewhat relevant to issue 6.5. Even though water classifications have been done for water bodies in the region, Policy 5.1 may remain relevant because water classifications or the way various types of water bodies are managed may alter as the perceived value of the water resource or the type and level of protection applied changes over time.

1.15.2 **Policy 6.1**

Protect the following wetland ecosystems from inappropriate subdivision, use and development:
Awarua Plain - Southland Estuaries including:
Waituna Scientific Reserve
Seaward Moss
Wetlands adjoining Awarua Bay
Wetlands adjoining Bluff Harbour
New River Estuary
Fortrose Harbour (including lower Mataura River)
. *Bayswater Bog*
Big Bay - Waiuna
. *Borland Mire*
Castle Downs (Hamilton Burn)
. *Drummond Peat Swamp (Isla Bank)*
Fiordland National Park (World Heritage site) including:
Back Valley
Grebe Valley
Lower Hollyford
Sutherland Sound

Five Mile Swamp (wetland in ancient Lake Wakatipu lake outlet)
Freshwater Valley including:
Freshwater Flats
Ruggedy Flat
The following wetlands in the Garvie Mountains
Blue Lake wetland
Gow Lake wetland
Scott Lake wetland
Haldane Estuary and reservoir
- *Lake George*
- *Lake Vincent, near Fortrose*
- *Lake Brunton, Otara*
- *Mount Tennyson string bog*

Redcliffe Reserve
- *So Big Swamp*

Silver Lagoon
- *Table Hill*

Te Anau Basin wetland complex including:
Kepler Mire
Dome Mire - Dismal Swamp
Dunton Swamp
Tekaro Wetland
Amoeboid Swamp
Kakapo Swamp
Snowdon Forest
Dale Lake
Lake Luxmore
Lagoon Creek
- *Toetoes Flats*
- *Waiau River - Te Waewae Lagoon*
- *Waikawa Estuary*
- *Waimatuku wetland*
- *Wairaki Lagoon (Waiau River)*

Waterloo (Aparima).

Southland contains many wetlands of a variety of types and land status, many of which have been extensively modified and developed. The above list represents those which are of known significance and must be protected from inappropriate subdivision, use and development. Consideration of the protection of other wetlands will be by way of Regional and District Plans, or a change to this Regional Policy Statement.

1.15.2.1 Policy 6.1 remains relevant to Issue 6.5 because of the way that effects that activities near wetlands (drainage and discharge of agricultural wetlands) have on ecosystem health. Thus, although a wetland area may be protected from development, major ecological modifications may occur due to the effects of

developments or activities on levels, flows or quality of water discharging into the wetland area.

1.15.3 **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.

1.15.3.1 Policy 6.3 is consistent with Issue 6.5. The Proposed Regional Water Plan for Southland contains a range of provisions for protecting heritage values and outstanding natural features of lakes, rivers and wetlands in the region. Even so, resource pressures and perceived values attached to the various types of lakes, rivers and wetlands are expected to undergo continuous change and ongoing review of the relevant provisions in the Water Plan will be necessary to ensure heritage values and outstanding natural features of lakes, rivers and wetlands in the Region are protected.

1.15.3.2 Policy 6.3 might be more relevant if it directed 'ongoing review' rather than 'establishment' of provisions to protect heritage values and outstanding natural features of lakes, rivers and wetlands.

1.15.4 **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.

1.15.4.1 Policy 6.4 appropriately reflects Issue 6.5. Consultation with Maori is necessary, both to gain improved understanding of the way in which their cultural systems interact with surface water and to establish how tangata whenua values of surface water may be affected by human activities in or near particular waterways.

1.15.5 **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.

1.15.5.1 Policy 5.5 is relevant to Issue 6.5 because activities or structures associated with access may result in modification of the hydrological components and habitat values of lakes, rivers and wetlands.

1.15.6 **Policy 6.6**

Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.

1.15.6.1 Policy 6.6 is relevant to Issue 6.5. The management of riparian areas is very important to indices of water quality such as levels of sediments, dissolved oxygen, phosphorous, nitrogen and faecal contaminants and ecological health in general. Ineffective riparian management can result in in-flow of significant quantities of contaminants.[103]

1.15.7 **Policy 6.7**

Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.

1.15.7.1 Policy 6.7 is relevant to Issue 6.5 because a high levels understanding is required to comprehend 'the needs and interactions of a complex and dynamic system', including the way that human activities modify the various components of this system.

1.15.8 **Issue 6.6**

Changes to the levels, flows and quality of water bodies can result in a loss of natural character and in-stream values in those water bodies.

Refer to Objective 4.2, 6.1; Policies 4.1, 6.6, 6.10 - 6.12; Methods 6.1 - 6.18

1.15.8.1 Issue 6.6 remains relevant in the current context. Even though changes to ecological flows and water levels are addressed in the Proposed Regional Water Plan, the issue remains significant as this plan will be reviewed over time. Also, action at the central government level[104] may mean that the way ecological flows and water levels are monitored and regulated will undergo change.

1.15.8.2 Changes to flows may affect the values of rivers and waterways in number of ways:

- the ability of lakes, rivers and wetlands to assimilate and remove contaminants;
- accumulation of sediments or gravel;
- growth of periphyton or algae;
- drying out of wetlands and subsequent invasion by exotic species;
- loss of wetland areas or disruption of reproductive cycles at the land-water interface of lakes;
- increased concentrations of contaminants that are discharged;
- negative effects on aquatic life resulting from increased fluctuations in temperature or oxygen levels.

1.15.8.3 Significant changes to levels, flows and water quality result activities such as hydro-electric power generation, open-caste mining or gravel extraction. An example of this is water diversion to Doubtful Sound and the effects that this has on flows and water quality within the Waiau River.

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[103] Review of Riparian Zone Effectiveness. MAF Technical Paper No: 2004/05 Prepared for MAF Policy by Stephanie Parkyn NIWA.

[104] Proposed National Environmental Standard on Ecological Flows (2008) and Proposed National Policy Statement on Freshwater Management (2008).

1.16 **Objectives relevant to Issue 6.6**

1.16.1 **Objective 4.2**
To manage the use and development of water and land resources so as, wherever practicable, to maintain and enhance flow regimes.

1.16.1.1 Objective 4.2 is consistent with the wording and intent of Issue 6.6. Flow regimes should be wherever practicable maintained and enhanced so as to preserve the intrinsic values and ecological health of water bodies.

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

1.16.2.1 Objective 6.1 is relevant to Issue 6.6 because maintaining ecological flows and water levels is essential to protecting natural character, heritage values and outstanding natural features of lakes, rivers and wetlands. This includes in-stream values, and values of importance to freshwater fisheries, flora and other fauna, recreational, and amenity values.

1.17 **Policies Relevant to Issue 6.6**

1.17.1 **Policy 4.1**
Prepare regional plan(s) to clearly identify regimes for the management of water quantity.

1.17.1.1 Policy 4.1 provides relevance and consistency with Issue 6.6. Policy 4.1 calls for changes to ecological flows and water levels of lakes, rivers and wetlands to be monitored and regulated through the use of regional plans. The use of regional and district plans is further examined in the discussion of methods later in this document.

1.17.1.2 Since The Regional Water Plan for Southland is close to being fully operative it will be necessary to change the wording of Policy 4.1 from 'Prepare…' to 'Maintain…'.

1.17.2 **Policy 6.6**
Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.

1.17.2.1 Policy 6.6 is relevant to Issue 6.6 because mitigation practices or changes of land use in riparian or near stream areas can have substantial effects in terms of water quality, ecosystem health and the values of the resource.

1.17.3 **Policy 6.1**

Recognise and provide for existing structures including hydroelectric 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.

1.17.3.1 Policy 6.10 is relevant to Issue 6.6 because the use and maintenance of hydroelectric installations and flood alleviation and other river management works may result in modifications to ecological flows and water levels. Policy 6.10 allows for ongoing modification of flows and levels in the Waiau River by diversion of water to Doubtful Sound for the purposes of electricity generation.

1.17.4 **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.

1.17.4.1 Policy 6.11 is marginally relevant to Issue 6.6 because it identifies a situation where levels, flows and water quality are to be maintained to fulfil the specific need of preserving human health. Maintaining environmental flows and water levels is particularly important for municipal supplies because of the negative consequences to the health and economic wellbeing almost certain to result from disruption.

1.17.5 **Policy 6.12**

Manage the Region's fluvial gravel resources in such a way as to avoid, remedy or mitigate adverse effects of gravel extraction.

1.17.5.1 Policy 6.12 is relevant to Issue 6.6 because it is important to allow for possible increases to pressure on the regional gravel resources in view of the high level of economic activity now occurring in the region. Gravel extraction can have a range of effects from diversion of water to siltation at the time of extraction and effects of permanent modification of the river bed.

1.17.5.2 Policy 6.12 might be made more relevant if it called for a coordinated response to the need for large amounts of gravel predicted to occur over the next few years. By concentrating gravel extraction activities in places where there is an excess of gravel or on alluvial terraces for example.[105]

1.18 **Issue 6.7**

Demand for gravel exceeds long-term sustainable yield from some reaches of rivers of the region.
Refer to Objective 6.4; Policy 6.12; Methods 6.5 - 6.12

1.18.1 Issue 6.7 is becoming more relevant due to increasing construction and roading works associated with economic activity in the region. Construction and roading

[105] Consultation with Southland District Council, 19-08-08

works are essential to ongoing economic growth and the future livelihoods of Southlanders.

1.18.2 It appears that current rates of gravel extraction are unsustainable in some locations, while surplus gravel accumulates in areas such as the Te Anau basin reaches of the Waiau River.

1.18.3 Furthermore, inappropriately executed gravel extraction can result in excessively deep cuts into the river, destabilisation of banks or river management works, or alteration of the course of the river. As such, gravel extraction activities should be carefully managed to avoid unnecessary effects on the beds, banks or flows of rivers.

1.19 Objectives relevant to Issue 6.7

1.19.1 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.

1.19.1.1 Objective 6.4 remains relevant to Issue 6.7. The high level of economic activity in the region and associated construction and roading works means that there is high current and predicted demand for gravel. To achieve sustainable outcomes it may be necessary to pay particular attention to the effects of gravel extraction activities and to attempt some kind of coordinated response.[106]

1.19.1.2 Objective 6.4 could be improved by setting a goal of undertaking gravel extraction in areas where there will be little impact on river systems. Possible examples include reaches of rivers where there is an excess of gravel, alluvial terraces and sites of open-caste mining or lignite extraction.

1.20 Policies Relevant to Issue 6.7

1.20.1 Policy 6.12

Manage the Region's fluvial gravel resources in such a way as to avoid, remedy or mitigate adverse effects of gravel extraction.

1.20.1.1 The wording and intent of Policy 6.12 is consistent with Issue 6.7. As demand for gravel increases, it is important to avoid, remedy or mitigate adverse effects that may arise so that gravel extraction necessary for economic growth can occur and the values of lakes, wetlands and rivers maintained and protected.

1.20.1.2 Policy 6.12 would be more relevant to Issue 6.7 if it required resource users to avoid adverse effects that might arise. Given the extent of effects and feelings of the public on the issue 'remedying or mitigating' effects once they occur is not enough; they should not occur in the first place.

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[106] Consultation and interviews with Southland District Council, August 2008

1.21 **Issue 6.8**

Gravel extraction can affect river bed profiles, stream ecosystems, river management works and flood channels.

Refer to Objectives 6.1, 6.4; Policies 6.5, 6.6, 6.7, 6.10, 6.12, 11.10; Methods 6.4 - 6.15

1.21.1 Objectives and Policies found not to be relevant: Policy 6.7

1.21.2 Issue 6.8 remains relevant in the current context. Southland is experiencing an economic boom and large scale gravel extraction is required for associated construction works.

1.21.3 Gravel extraction involves activities such as the creation of barriers across waterways, water diversion, excavation and permanent removal of material. Effects may include loss of river habitat, destabilisation of river banks, loss of water quality and modifications to ecological flows.

1.21.4 Issue 6.8 might be made more relevant by incorporation with Issue 6.7 as there appears to be some overlap between them, for example:

> *Gravel extraction is essential to maintain economic growth in the region, however current rates of gravel extraction have effects such as alteration of river bed profiles, stream ecosystems and flood channels that may not be sustainable in some situations.*

1.22 **Objectives relevant to Issue 6.8**

1.22.1 **Objective 6.1**

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

1.22.1.1 Objective 6.1 reflects Issue 6.8 as the activities associated with gravel extraction (diversion of water, removal of gravel from river beds and restoration work following cessation of the activity) has implications for the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands.

1.22.2 **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.

1.22.2.1 Objective 6.4 is consistent with the wording and intent of Issue 6.8. Gravel extraction can have effects on stream ecosystems, river management works and flood channels. Gravel extraction may have effects on water quality and quantity, the health of water ecosystems and be inconsistent with the economic and cultural

values of the people of Southland. There may also be adverse effects on fish passage, spawning areas and riparian vegetation.

1.23 **Policies Relevant to Issue 6.8**

1.23.1 **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.

1.23.1.1 Policy 6.5 is relevant to Issue 6.8 because public access may be restricted over the time that gravel extraction is carried out. The practice of gravel extraction involves activities and movements of heavy vehicles and access for the public is normally restricted for the duration of the gravel extraction activity for safety reasons. The excavation of holes and/or creation of unstable banks may also create a health and safety hazard that remains after the activity is finished.

1.23.2 **Policy 6.6**

Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.

1.23.2.1 Policy 6.6 is relevant to Issue 6.8 because the removal of large amounts of gravel can have substantial effects on amenity and in-stream values and there is also scope for modification of flows and issues with bank stability.

1.23.3 **Policy 6.7**

Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.

1.23.3.1 Policy 6.7 may not be relevant to Issue 6.8 because the effects of gravel extraction are well understood and gravel extraction activities are controlled through consent conditions.

1.23.4 **Policy 6.10**

Recognise and provide for existing structures including hydroelectric 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.

1.23.4.1 Policy 6.10 is relevant to Issue 6.8 because those undertaking gravel extraction must be careful to avoid effects on existing in-stream structures such as hydroelectric installations and flood alleviation and river management works, and

bridges. Inappropriate removal of gravel can result in destabilisation of these structures.

1.23.5 **Policy 6.12**
Manage the Region's fluvial gravel resources in such a way as to avoid, remedy or mitigate adverse effects of gravel extraction.

1.23.5.1 Policy 6.12 is consistent with the wording and intent of Issue 6.8. The relationship is effectively described in the explanation for policy 6.12:

> *'The removal of gravel from rivers can have both positive and negative effects which can have impacts both in the immediate area and further downstream.'*

1.23.6 **Policy 11.10**
Provide for the extraction of gravel from environmentally appropriate locations in order to enable the transportation networks of the Region to be maintained at a reasonable cost.

1.23.6.1 Policy 11.10 is relevant to Issue 6.8. In the current context there is a need to provide for adequate gravel extraction sites while meeting the demands created by economic growth.

1.23.6.2 Policy 11.10 might be more relevant if direction was given to local authorities to work together in a coordinated fashion to achieve sustainable removal of gravel in the quantities that are needed.

1.24 **Issue 6.9**
Agricultural runoff and inappropriate riparian management can adversely affect water quality, in 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

1.24.1 Objectives and Policies found not to be relevant: Policy 8.5

1.24.2 Refer to Riparian and Near Stream Areas

1.24.3 Issue 6.9 remains relevant. Activities in riparian areas[107] have increased in prominence, with 'non-point source pollution' from agriculture identified as a key driver of the region-wide decline in water quality experienced over recent years.[108]

1.24.4 The primary way that riparian activities affect water quality is via the direct discharge of contaminants into water or from runoff of contaminants. Direct

107 Riparian areas are areas in close proximity to waterway boundaries. Activities in these areas are highly likely to have some effect on the ecology or health of the associated water body. Riparian activities that can improve stream health include excluding stock and maintaining vegetative filter zones. For more information on riparian management see: Ministry of Agriculture and Forestry (2004) Review of Riparian Zone Effectiveness. MAF Technical Paper No: 2004/05 Prepared for MAF Policy by Stephanie Parkyn NIWA

108 Southland Regional Council (2008) Proposed Regional Water Plan for Southland.

discharge to water can result from stock access or the operation of installed subsurface drains. Runoff can contain a variety of contaminants, ranging from industrial contaminants, to nutrients and faecal contaminants from agricultural areas. Careful management of riparian areas can restrict runoff and discharge of contaminants.

1.24.5 Issue 6.9 might be made more relevant by broadening the scope to include 'hotspots' or (near-stream) areas that are particularly sensitive in terms of potential effects on the water resource or runoff from industrial, urban or peri-urban areas, for example:

> *There is a great deal of variation in the extent or severity of effects of activities in riparian areas on water quality, in rivers, wetlands and estuaries. Rate of discharge, riparian management, soil type and soil conditions, slope and sensitivity of the receiving environment all show substantial variation across the region.*

1.25 **Objectives relevant to Issue 6.9**

1.25.1 **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.

1.25.1.1 Objective 6.4 is relevant to Issue 6.9 because agricultural and other runoff and inappropriate riparian management has substantial negative effects on water quality in lakes, rivers and wetlands throughout Southland.

1.25.2 **Objective 8.2**
To avoid, wherever practicable, adverse effects arising from sedimentation and nutrient runoff from land into water bodies.

1.25.2.1 Objective 8.2 is consistent with the wording and intent of Issue 6.9 because the way riparian and near-stream areas are managed is a key determinant of runoff of sediments and contaminants (such as phosphorous, nitrogen and E. Coli) that occur. As such, riparian management and/or activities in riparian or near stream areas are believed to be responsible for much of the decline in water quality now occurring in Southland.

1.27 **Policies Relevant to Issue 6.9**

1.27.1 **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.

1.27.1.1 Policy 6.2 is relevant to Issue 6.9 because drainage activities and agricultural runoff can significantly modify ecological flows, water levels and water quality in wetland

areas in Southland. More research into the effects of nearby activities on wetland health would assist in effective and efficient management of the resource.

1.27.2 **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.

1.27.2.1 Policy 6.4 is relevant to Issue 6.9 because tangata whenua value a clean and bountiful water resource and are offended by the discharge of contaminants directly to water that may result from activities in riparian areas.

1.27.3 **Policy 6.6**

Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.

1.27.3.1 The wording and intent of Policy 6.6 is consistent with Issue 6.9. The explanation: '*Riparian management is necessary to buffer the effects of land use activities on adjacent lakes, rivers and wetlands.',* is a representation of Issue 6.9 in a policy context and gives a coherent and logical flow from an established goal to a direction for action.

1.27.4 **Policy 6.7**

Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.

1.27.4.1 Policy 6.7 is relevant to Issue 6.9. This is because information transfer is necessary to inform resource users of that way that activities in riparian and near stream areas can modify the values of the resource.

1.28 **Issue 6.10**

Vegetation clearance and landscape modification can result in increased sediment loads in streams and rivers

Refer to Objectives 5.2, 6.1, 6.4, 8.2; Policies 6.3, 6.6 - 6.7, 6.11; Methods 6.1 - 6.18

1.28.1 Objectives and Policies found not to be relevant: Policy 2.3, 6.5

1.28.2 Issue 6.10 is relevant as vegetation clearance and landscape modification continues to have an effect on loadings of sediments and other contaminants in rivers. The effects of vegetation clearance occur primarily through runoff following removal of vegetation and are therefore most severe on steep, marginal or low value land. Vegetation clearance can have a range of secondary effects, including effects on tangata whenua values, modification of sand dunes or habitat loss for indigenous plants and animals. Benefits of vegetation clearance may include removal of pest plants and animals and economic benefits of more productive use.

1.28.3 Issue 6.10 might be more relevant if it was broadened in scope and included other effects of vegetation clearance, such as the loss of the values of wetlands.

> *Vegetation clearance and landscape modification can result in increased sediment loads in streams and rivers, loss of ecological values and degradation of wetland areas.*

1.29 **Objectives relevant to Issue 6.10**

1.29.1 **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.

1.29.1.1 Objective 5.2 is relevant to Issue 6.10. Sediment runoff to waterways often results from activities associated with vegetation clearance and landscape change, particularly when the clearance occurs on steep or sloping ground and/or in situations that favour flows or runoff into waterways.

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

1.29.2.1 Objective 6.1 is relevant Issue 6.10 because vegetation clearance and landscape modification has potential to result in runoff of large amounts of sediments and significant impacts on in-stream values, including natural character or heritage values.

1.29.3 **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.

1.29.3.1 Objective 6.4 is relevant to Issue 6.10 because of the need to consider and mitigate the effects of activities such as vegetation clearance or landscape modification.

1.29.4 **Objective 8.2**
To avoid, wherever practicable, adverse effects arising from sedimentation and nutrient runoff from land into water bodies.

1.29.4.1 Objective 8.2 is very relevant to Issue 6.10 because of the need to consider and mitigate the effects of activities such as vegetation clearance or landscape modification and the sedimentation and nutrient runoff that can result.

1.30 **Policies Relevant to Issue 6.10**

1.30.1 **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.

1.30.1.1 Policy 6.3 is relevant to Issue 6.10 as regional and district plans may be able to place control over activities that have effects on the natural character and heritage values of lakes, rivers and wetlands. For example in areas with high levels of sensitivity to erosion and runoff of sediments.

1.30.2 **Policy 6.6**

Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.

1.30.2.1 Policy 6.6 is relevant to Issue 6.10 because vegetation clearance can involve the removal of riparian vegetation and increased risk of runoff into waterways or destabilisation of embankments.

1.30.3 **Policy 6.7**

Prepare information on the impacts and inter-relationships of various activities on lakes and river beds and wetlands to improve understanding.

1.30.3.1 Policy 6.7 is relevant to Issue 6.10. The effects of landscape modification vary depending on topography, soil type and distance to waterways. Some research has been done on vegetation clearance, landscape modification and migration of contaminants into waterways and the effects that can result.

1.30.4 **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.

1.30.4.1 Policy 6.11 is relevant to Issue 6.10 because the large scale sedimentation might result from clearance of the ground is a threat to the ability of water supplies to support and maintain human health. This is particularly important in the Southland context because municipal water supplies are sourced from rivers.

1.31 **Issue 6.11**

Lack of access to, along, and across some lakes, rivers and wetlands.
Refer to Objectives 6.1 - 6.3; Policy 6.5; Methods 6.1 - 6.4, 6.8 - 6.13, 6.16

1.31.1 Refer to Access

1.31.2 Issue 6.11 remains a relevant issue in the Southland context. Access is necessary to undertake economically important activities such as mining, mineral extraction and farming. The public also require access to natural areas such as natural areas or lakes, rivers and wetlands for a range of recreation activities. Finally, tangata whenua have a right to access certain areas for culturally and spiritually important activities such as food gathering, collecting pounamu and visiting significant sites.

1.31.3 It is important to note that access can have both positive and negative effects, for example while access may benefit recreational users, uncontrolled public access, either for private recreation or commercial tourism, can damage wetlands where use is intense. Of particular concern is the driving of motor vehicles and motorbikes through wetland areas.

1.32 **Objectives relevant to Issue 6.11**

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

1.32.1.1 Objective 6.1 is relevant to Issue 6.11 as there is a need to balance maintaining values with provision of access. Although access is necessary if resource users are to enjoy the resource it is important to consider the negative effects that may result. The presence of people or infrastructure associated with access will have effects on '*natural character, heritage values and outstanding natural features of lakes, rivers and wetlands'*.

1.32.2 **Objective 6.2**
To recognise and provide for the relationship of Maori and their culture and traditions with lakes, rivers and wetlands.

1.32.2.1 Objective 6.2 is relevant to Issue 6.11 because Maori require access to certain lake, river or wetland areas for food gathering or to visit sites of cultural or spiritual significance.

1.32.3 **Objective 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.

1.32.3.1 Objective 6.3 is consistent with the wording and intent of Issue 6.11. Objective 6.3 is a translation of the problem of access identified in Issue 6.11 into goals for action.

1.33 **Policies Relevant to Issue 6.11**

1.33.1 **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.

1.33.1.1 Policy 6.5 is consistent with the wording and intent of Issue 6.11. Policy 6.5 is a translation of the problem of access identified in Issue 6.11. Policy 6.5 recognises that resource users should be allowed to exercise their rights of access, at the same time as provision is made to avoid undesirable effects arising from the activity or activities associated with access.

1.34 **Issue 6.12**

Hydro-electric power generation results in social, cultural and economic and ecological impacts at the local, regional and national level.

Refer to Objective 6.4; Policies 6.10, 14.5, 14.9; Methods 6.7 - 6.11, 6.13

1.34.1 The social, cultural and ecological effects of hydro-electric power generation remain a relevant resource issue for Southland, particularly since the majority of hydro-electric resources are positioned within or adjacent to Fiordland National Park, a natural area of national and international significance.

1.34.2 The generation of hydro-electricity can be a sustainable use of the waters of the Region, and under certain circumstances the establishment and expansion of such an activity may be appropriate. The effects of such a use are complex and it is appropriate to consider them as part of Regional and District Plans. The Waiau, Monowai and Mataura Rivers are used for electricity generation purposes, resulting in significant impacts upon the Waiau and Monowai Rivers.

1.34.3 Other rivers within the Region do have some hydro-electric development potential. Consideration of any future development of the rivers of the Region for hydro-electric purposes will need to have regard to the intrinsic values of those rivers, and the effects such development will have.

1.34.4 Issues associated with hydro-electric power development include:

- increased water levels and flooding of adjacent lands resulting from storage lakes, for example, Lake Monowai
- impediments to fish passage

- the effects of artificially managed fluctuations in lake levels on animal and plant communities
- minimum flows and flow regimes
- river and lake levels
- potential for improved flood management
- requirements for access and facilities
- changes in landscape and loss of natural character
- adverse effects on flora and fauna, including trout and salmon habitats

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1.35 **Objectives relevant to Issue 6.12**

1.35.1 **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.

1.35.1.1 Objective 6.4 accurately reflects Issue 6.12 in that it addresses the effects of hydro-electric power generation in, on, under, adjacent to, or over the beds of lakes, rivers and wetlands. The structures involved may occupy areas of river bed or wetland, while their use and operation may cause inundation of rivers or wetlands, or modification of ecological flows and water levels in down-stream areas.

1.36 **Policies Relevant to Issue 6.12**

1.36.1 **Policy 6.10**
Recognise and provide for existing structures including hydroelectric 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.

1.36.1.1 Policy 6.10 is relevant to Issue 6.12 because it directs resource managers to minimise the effects associated with use, maintenance, upgrading or enhancement of hydro-electric power schemes on lakes, rivers and wetlands. Policy 6.10 also guides and directs upgrading or enhancing existing structures if this will result in mitigation of effects.

1.36.2 **Policy 14.5**
Avoid, wherever practicable, remedy or mitigate the adverse effects of energy production, use, transmission and distribution.

1.36.2.1 Policy 14.5 is relevant to issue 6.12. as with Policy 6.10, Policy 14.5 calls for resource managers to minimise the adverse effects of hydro-electric power generation, including if practicable, modification of structures.

1.36.3 **Policy 14.9**
Recognise and provide for the use and enhancement of existing hydro-electricity facilities.

1.36.3.1 Policy 14.9 is relevant to Issue 6.12 because it recognises the vital economic and social role of reliable and low cost electricity supply and guides and directs resource managers to provide for the ongoing use or improvement of existing hydro-electric plants.

1.37 **Issue 6.13**

There is a need to recognise, and make provision for the maintenance of, flood alleviation and river management works, community drains, and other infrastructural assets.

Refer to Objective 6.4; Policies 6.5, 6.6, 6.8 - 6.10, 10.4, 15.6, 15.9, 15.10, 15.12

1.37.1 Objectives and Policies found to be not relevant: Objective 6.4 Policy 6.8, 15.6, 15.10, 15.10

1.37.2 Issue 6.13 remains relevant in the contemporary context. The built environment and rural areas often include river management works and community drains to protect against loss of life or property resulting from the effects of natural hazards. These works require ongoing maintenance and monitoring if they are to be effective.

1.37.3 River management works have been undertaken from the beginning of European settlement. These consist mainly of the planting and clearing of willows, channelisation and the construction of stop banks, to avoid or mitigate flooding hazards. While river management works are necessary responses to the need to avoid or mitigate flood hazards, the activities associated with these works can themselves result in adverse effects on the environment. These include:

- stopbank construction involving large volumes of gravel, sand and other materials can increase sediment loads and turbidity levels in water bodies
- willow planting and stock grazing can alter, damage or destroy wildlife habitats
- activities which involve river meander removal or reduction of instream habitat diversity can significantly damage the natural character of rivers
- stopbanks and related river management reserves can have an affect on amenity values such as landscape and right of access
- the construction and location of stopbanks can have an effect on wahi tapu and other taoka

1.37.4 For these reasons it will be necessary for works in rivers and river beds to be assessed on a case by case basis to ensure adverse effects are avoided, remedied or mitigated.

1.38 **Objectives relevant to Issue 6.13**

1.38.1 **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.

1.38.1.1 Objective 6.4 does not appear to be relevant to Issue 6.13 as the issue is about the provision for the maintenance of river management works and other infrastructural assets, not the effect of these structures on the water resource

1.39 **Policies Relevant to Issue 6.13**

1.39.1 **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.

1.39.1.1 Policy 6.5 is relevant to Issue 6.13 because it may be necessary to prevent access to: '*protect the integrity of flood alleviation or river management works'*. The presence of flood protection works may also facilitate access when undertaken in an appropriate manner; the walking tracks on top of flood protection works on the Waihopai for example.

1.39.2 **Policy 6.6**

Enhance the water quality, amenity and instream values of lakes, rivers and wetlands and promote bank stability.

1.39.2.1 Policy 6.6 is relevant to Issue 6.13 because of the identified need to 'promote bank stability'.

1.39.2.2 The way that these areas are managed will affect bank stability as well as having implications for vulnerability to runoff of contaminants and values of affected lakes, rivers and wetlands.

1.39.3 **Policy 6.9**

Provide for the continued maintenance of community drains to facilitate drainage and prevent damage to community assets while avoiding, remedying or mitigating adverse effects on water quality and stream flora and fauna.

1.39.3.1 Policy 6.9 is consistent with the wording and intent of Issue 6.13 because maintenance of community drains are specifically mentioned as an aspect of the issue. While community drains are required to be maintained to protect property and public safety, it is important to consider the effects that maintenance activities have on stream health and ways that resource users can act to reduce the frequency with which maintenance is required.

1.39.4 **Policy 6.10**
Recognise and provide for existing structures including hydroelectric 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.

1.39.4.1 Policy 6.10 directly expresses the wording and intent of Issue 6.13. Policy 6.10 calls for the '*maintenance, upgrading or enhancement'* of flood alleviation and river management works while '*avoiding wherever practicable, mitigating or remedying any adverse effects'*. In other words to recognise and make provision for these works.

1.39.5 **Policy 10.4**
Recognise and minimise the risks of natural hazards on the built environment.

1.39.5.1 Policy 10.4 is relevant to Issue 6.13 because it recognises the value of flood alleviation and river management works. These structures help alleviate natural hazards and therefore play an important role in reducing economic and health and safety risks to the inhabitants of the region.

1.39.6 **Policy 15.9**
Protect hazard alleviation works from inappropriate activities.

1.39.6.1 Policy 15.9 is relevant to Issue 6.13 because it addresses aspects relating to activities that may impeded the functionality of flood alleviation and river management works. Inappropriate excavation, or land use activities that result in de-vegetation are examples of activities that can impede or compromise the intended function of these structures.

1.40 **Issue 6.14**
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

1.40.1 The lack of a sphagnum moss industry in Southland means that Issue 6.14 is of limited relevance in the current context.

1.41 **Objectives relevant to Issue 6.14**

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

1.41.1.1 Objective 6.1 is relevant to Issue 6.14 because the harvesting of sphagnum moss or other wild vegetation and animals may give rise to effects that impact on the natural character, heritage values and outstanding features of lakes, rivers and wetlands in the region. Possible effects include depletion of the resource being harvested and disturbances or modifications that might result from the activity. Disturbances might result in effects such as removal of plants that provide cover or habitat for other plants and animals, invasion of pest plants or drying out as ground is left bare and release of sediments into waterways.

1.41.2 **Objective 6.2**
To recognise and provide for the relationship of Maori and their culture and traditions with lakes, rivers and wetlands.

1.41.2.1 Objective 6.2 is relevant to Issue 6.14 because the harvesting of resources is of interest to tangata whenua and consultation is desirable to ensure tangata whenua values placed on a resource are respected and maintained.

1.42 **Policies Relevant to Issue 6.14**

1.42.1 **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.

1.42.1.1 Objective 6.4 is relevant to Issue 6.14 because harvesting involves activities that may disturb the beds of lakes, rivers and wetlands which can result in effects on the values of the resource. These include release of sediments and ecological change as areas are de-vegetated, fish habitat is removed and the area re-colonised by other plant species.

1.43 **Chapter 8. Soil**

1.44 **Issue 8.1**
The long term sustainable management of the most versatile soils in the Region may be compromised by activities, and the effects of activities, undertaken.
Refer to Objectives 8.1, 8.4; Policies 8.1 - 8.3, 8.5; Methods 8.1 - 8.16

1.44.1 Policies and Objectives that are no longer relevant: Policy 8.7

1.44.2 Refer to soil loss and soil degradation and peri-urban expansion

1.44.3 The long term sustainable management of versatile soils remains a relevant issue in Southland. The current RPS defines versatile soils as "those which are capable of supporting a variety of intensive land use enterprises in a sustainable manner." This variety of potential uses means that versatile soils are important to the livelihoods of current and future generations of Southlanders and require special protection or focussed controls on development.

1.44.4 The Topoclimate project[109] has resulted in improved understandings of the scope and extent of versatile soils in Southland. This project included mapping of the extent and location of soils able to support a variety of enterprises or high production. The Topoclimate Project identified approximately 95,300 hectares of Southland soils as 'high producing', these included Waikiwi, Edendale, Tokanui, Waimatuku, Tuturau, Crookston, Arthurton, and Drummond soils.

1.44.5 Versatile soils may be lost through inappropriate land management, contamination or residential developments.

1.44.6 High producing or versatile soils are often the site of intensive land use enterprises such as dairying, intensive cropping and horticulture and activities with a high risk of environmental effects such as frequent applications of fertiliser, intensive stocking, frequent cultivation and spraying of agrichemicals.

1.44.7 Peri-urban expansion and residential subdivision has been identified as a particular area of concern with regards to loss of versatile or high producing soils.[110] For example, residential subdivision activity in areas to the north of Invercargill has resulted in significant areas of Waikiwi soils being permanently lost to production.[111] These soils are highly productive and are ineffective as effluent disposal fields for septic tanks. Thus, this subdivision has resulted both in loss of these soils to current and future generations and risks to the values of associated water bodies.

1.44.8 Versatile soils are not given special protection under the RMA, rather that Act requires the sustainable management of all soils. However, the more significant the resource the greater is the justification to ensure it is managed in a sustainable manner.

109 The Topoclimate© survey was carried out in Southland and South Otago in 1998–2001. This project involved the collection and compilation of region wide data on the climate and soils. The maps and database allow land users to match land enterprises to the soil and climate resource. This information has been made publicly available for the benefit of the community as a whole. See: The Topoclimate© Project [online] es.govt.nz

110 Consultation with representatives of Southland District Council (18-08-2008)

111 Consultation with representatives of Invercargill City Council (16-09-2008)

1.45 **Objectives Relevant to Issue 8.1**

1.45.1 **Objective 8.1**
To promote the sustainable management of all soils.

1.45.1.1 Objective 8.1 accurately reflects Issue 8.1 because it calls for sustainable management of all soils, which includes versatile soils. Versatile soils are mentioned as an area of interest in the explanation:

> *'The soil resource of the Southland Region, especially the most versatile soils, needs to be managed in such a way that the aspirations of future generations will be able to be met.'*

1.45.1.2 In other words, particular regard is to be given to protection of versatile soils.

1.45.2 **Objective 8.4**
To avoid contamination of soils.

1.45.2.1 Objective 8.4 is relevant to Issue 8.1. Contamination has been a problem with versatile soils as their higher economic potential means that they tend to be more under pressure. Sites of

1.46 **Policies Relevant to Issue 8.1**

1.46.1 **Policy 8.1**
Maintain and enhance Southland's soil resource by avoiding, remedying or mitigating the adverse effects of activities.

1.4.6.1.1 Policy 8.1 is relevant to Issue 8.1 because the productive potential of versatile soils can be affected by the adverse effects of land use activities carried out. Adverse effects may include degradation or loss of soil structure, build up of contaminants, erosion by wind or water and permanent loss due to peri-urban expansion.

1.46.2 **Policy 8.2**
Provide for the sustainable management of the most versatile soils of the Region.

1.46.2.1 Policy 8.2 is relevant to Issue 8.1.

1.46.2.2 Policy 8.2 might be improved by a tighter definition of required action, for example: 'provide for the protection of versatile soils from the adverse effects of activities and land use change.'

1.46.3 **Policy 8.3**
Develop indicators of land sustainability to measure soil resource trends in partnership with landowners, land occupiers, communities and agencies.

1.46.3.1 Policy 8.3 is relevant to Issue 8.1 because of the regional economic importance of versatile soils. The topoclimate project involved mapping of soils and climatic conditions across Southland. This dataset and the accompanying maps provide resource users with detailed information on the capabilities and vulnerabilities of the soils on their farm.

1.46.3.1 In the context of the widespread landuse changes now occurring, there is a specific need to assess the ways in which land use activities affect the values of the soil resource and to communicate this information to resource users.

1.47 **Policy 8.5**
Promote land use practices which avoid the contamination of soils.

1.47.1 Policy 8.5 is relevant to Issue 8.1. As noted in Objective 8.4, the economic values of versatile soils means that they are more likely to be under pressure from intensive land use activities and therefore to be the site of contamination.

1.48 **Issue 8.2**
Although appropriate in many cases the discharge of liquid trade wastes, chemicals, waste products and domestic sewage to land, for example, sludge onto land and waste lubricating oil onto roads, can restrict the range of activities that can be carried out on the land, cause soil degradation and have adverse environmental effects. In the extreme, the contamination of soils restricts their use and may have other effects, for example, on water quality and health.
Refer to Objectives 4.1, 5.2, 6.4, 8.1, 8.2, 8.4, 5.2, 11.1 16.1; Policies 4.5, 5.2, 5.4, 5.5, 6.2, 8.1, 8.2, 8.5, 8.6, 11.4, 17.5; Methods 8.1 - 8.3, 8.5 - 8.12

1.48.1 Policies that are no longer relevant: Policy 8.2

1.48.2 Issue 8.2 is relevant in the current context. A variety of land use activities may result in discharge of inorganic or industrial wastes. The discharge of these wastes can have effects on quality of soil, water and air. In recent years, reductions in uncontrolled discharge of industrial pollutants have been balanced by increased public concern over the effects of these activities.

1.48.3 The issue of contamination by inorganic wastes has both historical and contemporary aspects. It is a historical problem in terms of identification, rehabilitation or avoidance of sites of past contamination and a contemporary problem in that activities being carried out now involve risks of contamination of soils.

1.48.4 In the contemporary context there are a range of activities that involve discharge of inorganic waste. In rural areas these include fertilizer applications, sheep dipping, applications of pesticides and herbicides, illegal dumping, on-farm dumps and disposal of dairy processing plant waste. In peri-urban and urban areas, activities that involve disposal of inorganic wastes include car wrecking, wood

processing, aluminium smelting, meat processing, disposal of domestic sewage and runoff associated with the traffic network. Contaminants such as oil, tyre residues or spilled substances accumulate on road surfaces and run off during rainfall events.

1.48.5 In the historical context, there is some concern over contamination from bioactive chemicals that persist in the environment such as PCBs, DDE, dieldrin, arsenic, and some agrichemicals. In some cases sites of contamination are unknown and contaminants are known to be present in groundwater.[112]

1.48.6 The accumulation of contaminants can result in restrictions on the way land is used or even retirement of land, there may also be impacts on stream health or the health of people living or working in or near the affected area. For example, DDT residues may persist for many years and be available for ingestion by livestock, reducing the value of meat or milk produced.[113]

1.48.7 Currently there is some concern over lack of knowledge of 'emerging contaminants[114] and their effects. Contaminants that have become apparent in recent times include the accumulation of fluorine following phosphate fertilizer applications[115] [116] and the presence of oestrogen in farm dairy effluent[117]. Even though these contaminants have been found to present a low level of risk to the Southland environment, there is always the possibility that the discharge of bioactive substances to the environment will have unanticipated effects.

1.49 Objectives Relevant to Issue 8.2

1.49.1 Objective 4.1

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

1.49.1.1 Objective 4.1 is Relevant to Issue 8.2 because discharge of liquid trade wastes, chemicals, waste products, and sewage to land might result in these substances entering water. These substances can have severe effects on ecosystem health and the life supporting capacity of waterways.

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112 Sinclair Knight Mertz (2008) Edendale Pesticide Monitoring. Report Prepared for Environment Southland.

113 Boul, H. (1994) DDT residues in the environment. New Zealand Journal of Agricultural Research, 1994, Vol. 38: 257-277 © The Royal Society of New Zealand 1995

114 The condition of rural water and soil in the Waikato region: Risks and opportunities. [online] www.ew.govt.nz

115 The condition of rural water and soil in the Waikato region: Risks and opportunities (ibid)

116 Southland Regional Council (2007) Summary of risks from cadmium in agricultural soils (Draft) The Cadmium Working Group's summary report one November 2007

117 Sarmah k., A., Northcott, G., L. and Tremblay, L., A. (2005) A Scoping Report on Endocrine Disrupting Chemicals (EDCs) and their Relevance to New Zealand. Landcare Research Contract Report: LC0506/037. Prepared for Environment Waikato, Hamilton. November 2005

1.49.2 **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.

1.49.2.1 Objective 5.2 is relevant to Issue 8.2 in that preventing the effects of the discharge of contaminants is recognised as a goal for resource management.

1.49.3 **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.

1.49.3.1 Objective 6.4 is relevant to Issue 8.2 because activities that involve discharges in near-stream areas or in proximity to installed subsurface drains may have adverse effects on the values of lakes, rivers and wetlands.

1.49.4 **Objective 8.1**
To promote the sustainable management of all soils.

1.49.4.1 Objective 8.1 is relevant to Issue 8.2 because activities that involve discharges to land may not be compatible with the goal of sustainable management of the soil resource, and policies and methods are required to avoid adverse effects.

1.49.5 **Objective 8.2**
To avoid, wherever practicable, adverse effects arising from sedimentation and nutrient runoff from land into water bodies.

1.49.5.1 Objective 8.2 weakly reflects Issue 8.2 this is because discharge of trade wastes, chemicals, waste products and domestic sewage to land involve significant risks of runoff to waterways. Objective 8.2 might be improved by a more inclusive definition of contaminants that can have effects on ecosystem health, for example: 'To avoid wherever possible, adverse effects arising from runoff of contaminants into water bodies.'

1.49.6 **Objective 8.4**
To avoid contamination of soils.

1.49.6.1 Objective 8.4 is consistent with the wording and intent of Issue 8.2 because it recognises the potential for discharges to land to contaminate soils and cause long term effects on the values of the resource.

1.49.7 **Objective 11.1**
To minimise the adverse effects of transportation modes and infrastructure on natural and physical resources, so that these resources can be managed in such a way that they are able to meet the needs of future generations.

1.49.7.1 Objective 11.1 is relevant to Issue 8.2 because transportation modes and infrastructure can result in discharges to land. Contaminants such as tyre residue

and oil accumulate on road surfaces before being washed to land during rainfall events. Associated road reserves or other land may also be the site of application of agrichemicals as weed control is undertaken.

1.49.8 **Objective 16.1** *To minimise adverse social, cultural, economic and environmental effects of solid waste disposal.*

1.49.8.1 Objective 16.1 is relevant to Issue 8.2 as disposal of inorganic waste can have a range of social, cultural, economic and environmental effects.

1.50 **Policies Relevant to Issue 8.2**

1.50.1 **Policy 5.2**
Require all point source discharges, after reasonable mixing, to comply with water quality standards.

1.50.1.1 Policy 5.2 is partly relevant to Issue 8.2 because installed subsurface drains may concentrate and transport contaminants, creating a point source discharge where the drain meets a waterway. The irrigation of farm dairy effluent onto soils with installed subsurface drains is known to result in point source discharges to streams and similar effects could occur with other types of contaminants discharged to land.[118]

1.50.2 **Policy 5.4**
Utilise land treatment of liquid wastes where this can be undertaken in a sustainable manner and without significant environmental effects.

1.50.2.1 Policy 5.4 is relevant to Issue 8.2 because it gives support to the land treatment of wastes in a way that is sustainable and without significant environmental effects. Land treatment of wastes is seen as preferable to direct discharge of contaminants into waterways where there are likely to be severe effects on ecosystem health and the values of lakes, rivers and wetlands.

1.50.3 **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 source and non-point source discharges, and provide for any adverse effects to be avoided, remedied or mitigated.

1.50.3.1 Policy 5.5 is relevant to Issue 8.2 because regional and district plans and resource consents provide controls on the circumstances under which industrial wastes, chemicals and sewage can be discharged to land.

[118] Winter, R and Templeton, V (2008) Low Application rate Effluent Management. Proceedings of the South Island Dairy Event. July 2008

1.50.4 **Policy 6.2**

Encourage the undertaking of research investigating the relationships between wetlands and their surrounding environment and the activities that can impact on wetlands.

1.50.4.1 Policy 6.2 is relevant to Issue 8.2 as some wetlands are exposed contamination by industrial contaminants, the Awarua wetland for example. Discharge and runoff of contaminants can have significant effects on wetland ecosystem health.

1.50.5 **Policy 8.1**

Maintain and enhance Southland's soil resource by avoiding, remedying or mitigating the adverse effects of activities.

1.50.5.1 Policy 8.1 is relevant to Issue 8.2 because discharges to land may reduce the life supporting capacity of the soil. For example high applications of effluent and manure may result in accumulation of potassium salts to levels that are toxic to lactating cows. Historically, discharges of chemicals such as DDT have resulted in long term reductions in the life-supporting capacity of the soil resource.

1.50.6 **Policy 8.2**

Provide for the sustainable management of the most versatile soils of the Region.

1.50.6.1 Policy 8.2 does not appear to be relevant to Issue 8.2 as all lowland soils are potential sites of intensive economic activity and thus at risk of adverse effects associated with excessive applications of chemicals or animal wastes.

1.50.7 **Policy 8.5**

Promote land use practices which avoid the contamination of soils.

1.50.7.1 Policy 8.5 is consistent with the wording and intent of Issue 8.2, it also gives support to Objective 8.4 To Avoid Contamination of Soils. These linkages are described in the explanation:

> *Contamination of soils can arise from the discharge of agricultural wastes, and the application of contaminants, such as chemicals and waste products, to land. These activities can cause soil degradation, have adverse environmental effects and can ultimately restrict the potential use of land.'*

1.50.8 **Policy 8.6**

Require, where practicable, the rehabilitation of contaminated soils where there is a significant adverse effect on the environment.

1.50.8.1 Policy 8.6 is relevant to Issue 8.2 because contaminated soils recover over time and resource users can act to speed this recovery.

1.50.9 **Policy 11.4**

Require district and regional plans to include provisions that avoid, remedy or mitigate the adverse effects of transportation and transportation infra-structure on natural and physical resources, so that these resources can be managed in such a way that they are able to meet the needs of future generations.

1.50.9.1 Policy 11.4 is relevant to Issue 8.2 because transportation modes and infrastructure can result in discharges to land. Contaminants such as tyre residue and oil accumulate on road surfaces before being washed to land during rainfall events. Associate land may also be the site of application of agrichemicals as weed control is undertaken.

1.50.10 **Policy 17.5**

Minimise the adverse effects on the environment from the storage, use, discharge, transportation and disposal of hazardous substances.

1.50.10.1 Policy 17.5 is relevant to Issue 8.2 as the storage or transportation of waste can also have effects on the environment or on human health.

1.51 **Issue 8.3**

Soil loss and soil degradation can result in some cases from certain land use practices, for example, urbanisation, cultivation, drainage, vegetation clearance, tracking, compaction from stock trampling, overgrazing and burning. Vegetation clearance, burning and overgrazing may also reduce conservation values.

Refer to Objectives 8.1, 8.4, 8.5; Policies 6.11, 8.1, 8.2, 8.4, 8.5, 8.6; Methods 8.1, 8.2, 8.5 - 8.12

1.51.1 Policies and Objectives that are no longer relevant: Policy 8.2

1.51.2 Issue 8.3 remains relevant in the current context as degradation and loss of soils continues to occur.

1.51.3 Soil can be degraded by soil compaction (from movement of heavy machinery, high stocking rates or cultivation when the soil is too wet.[119]), loss of organic matter, loss of soil structure, depletion of nutrients or accumulation of weeds or crop diseases. The soil resource may also be permanently lost due to erosion (by wind or water) or land development (residential subdivision).

1.51.4 The risk of soil degradation or loss increases as more intensive use is made of soils. For example, winter grazing involves heavy stocking and movements of machinery

119 McLaren R.G. and Cameron K.C. (1993 ibid

over the winter when the soil is wet, with consequent risks to soil quality.[120] There may also be secondary effects as crop pests or fungal diseases accumulate in the soil and contaminants such as sediments, dissolved phosphorous, nitrates and E. Coli are generated at a time when they are mobile.

1.51.5 Some soils may also be inherently vulnerable or fragile. The most fragile soils are those of erosion-prone high country areas[121], but other fragile soils occur on coastal margins, on sand dunes or steep hills and in areas where soil development is limited by natural factors such as slope, wind, dryness and wetness.

1.51.6 The expansion of the built environment continues to occur in a way that results in loss of the values of soils, particularly versatile or productive soils. Given that none of the territorial authorities in Southland have adopted a regulatory response to this issue, it would appear that some guidance at a regional level is required. However, the RMA is generally silent on this issue, adopting a generic approach to "sustainably manage all natural and physical resources".

1.52 Objectives Relevant to Issue 8.3

1.52.1 Objective 8.1

To promote the sustainable management of all soils.

1.52.1.1 Objective 8.1 accurately reflects Issue 8.3 because appropriate land use practices and managing growth that removes land from production are a key aspect of sustainable management of soils. When undertaking activities that result in de-vegetation such as cultivation, winter grazing and vegetation clearance it is important to prevent compaction or pugging.

1.52.2 Objective 8.4

To avoid contamination of soils.

1.52.2.1 Objective 8.4 is relevant to Issue 8.3 because land use practices such as animal waste disposal on land may result in contamination of the soil resource.

1.52.3 Objective 8.5

To avoid, remedy or mitigate any adverse effects of the use or development of land on wahi tapu, wahi taoka and archaeological sites.

1.52.3.1 Objective 8.5 is relevant to Issue 8.3 because intensive land use practices may have effects on wahi tapu, wahi taoka or archaeological sites. For example, drainage can

120 de Wold (2006) An alternative wintering system for Southland: A comparison of wintering cows outside, on brassica crops versus inside, in a free stall barn in Southland, New Zealand. A dissertation submitted in partial fulfilment of the requirements for the Degree of Master of Professional Studies. At Lincoln University. By Abe de Wolde. Lincoln University 2006

121 Meneer et. al. (2004) ibid

result in effects such as discharges of contaminants directly to water and modifications to ecological flows in nearby wetlands.

1.53 **Policies Relevant to Issue 8.3**

1.53.1 **Policy 8.1**
Maintain and enhance Southland's soil resource by avoiding, remedying or mitigating the adverse effects of activities.

1.53.1.1 Policy 8.1 is consistent with and relevant to Issue 8.3. The way that the soil is used in combination with the techniques or strategies applied determines the kinds of losses that may or may not occur.

1.53.2 **Policy 8.2**
Provide for the sustainable management of the most versatile soils of the Region.

1.53.2.1 Policy 8.2 may not be relevant to Issue 8.3 because all soils are vulnerable to degradation or loss.

1.53.3 **Policy 8.4**
Recognise and provide for Maori cultural and traditional spiritual values and consult the tangata whenua, when making statutory decisions on soil issues and preparing a Regional Sustainable Land Management Plan.

1.53.3.1 Policy 8.4 is relevant to Issue 8.3 because of the effects of widespread land development activities on tangata whenua values associated with land. Land development is of interest because activities such as land clearance or drainage activities have a range of effects on tangata whenua values of lakes, rivers and wetlands as well as land.

1.53.4 **Policy 8.5**
Promote land use practices which avoid the contamination of soils.

1.53.5 Policy 8.5 is somewhat relevant to Issue 8.3. Certain land use activities such as the discharge of animal wastes to land can result in contamination of the soil resource.

1.53.6 **Policy 8.6**
Require, where practicable, the rehabilitation of contaminated soils where there is a significant adverse effect on the environment.

1.53.6.1 Policy 8.6 is relevant to Issue 8.3 as land use practices may be effective in rehabilitation of the soil resource.

1.54 **Issue 8.4**

The incorrect disposal of agricultural wastes to land, including dairy and piggery shed effluent, offal pits and silage pit leachate, can have adverse effects on soil resources.

Refer to Objectives 8.1, 8.4; Policies 5.4, 6.11, 8.1 – 8.2 8.5; Methods 8.1, 8.2, 8.5 - 8.11, 8.14

1.55 **Policies and Objectives that are no longer relevant: 8.3, 8.6**

1.55.1 Issue 8.4 is relevant in the current context because land use activities often involve discharges of animal wastes to land. Organic wastes are often collected or accumulated in the course of agricultural enterprises. These wastes must be treated appropriately to avoid adverse effects on the soil and water resources.[122]

1.55.2 Activities that involve accumulation and/or discharge organic wastes to land include:

- storage of farm dairy effluent;
- accumulation of animal wastes in livestock holding areas, feed pads, wintering barns and pig farms;
- accumulation of animal wastes in calving sheds or woolsheds;
- accumulation of animal wastes in farm offal pits, freezing works or rendering plants.

1.55.3 Under most circumstances, the accumulation of organic waste is a preferred practice as it allows controlled discharge of contaminants that would otherwise be discharged in circumstances where they might enter water, for example in irrigation of farm dairy effluent to land in early spring[123] or grazing in forage based wintering systems[124].

1.55.4 Land application of accumulated animal wastes involves some risks to nearby waterways and the life giving capacity of soils. For example, to avoid effects on water quality, farm dairy effluent should be applied at a time when soil conditions are such that it is utilised by plants rather than being transported to waterways in surface or subsurface flow.[125] To avoid effects on the soil resource it is important to ensure that salts contained in manure do not build up to levels that impede the productive capacity of soils or have effects on animal health.[126]

122 Dairynz (2008) The Grass Roots of Effluent Management. A Practical Approach. [online] dairynz.co.nz

123 Irrigation of farm dairy effluent at times of year when soil is saturated (spring) has been shown to result in runoff of nitrates, organic phosphorus and faecal contaminants to streams. Southland Regional Council (2007) Farm Dairy Effluent: Best Practice Guidelines

124 Forage based wintering systems involve intensive stocking and heavy machinery movements at a time when the soil is wet. This results in risks of soil damage and runoff of contaminants to waterways. De Wold (2006) ibid

125 Southland Regional Council (2007) Farm Dairy Effluent: Best Practice Guidelines

126 United States Department of Agriculture Soil Conservation Service (1992) Agricultural Waste Management Field Handbook. Chapter 5. Role of Soils in Waste Management

1.55.5 Disposal of offal creates risks for water and air quality and risks to human health from infestation by flies and vermin. A desirable way to dispose of offal is pick up by a licensed dead stock carrier. Failing this, offal should be disposed of in a specially prepared offal pit, kept well away from children and inaccessible to dogs and vermin. Offal pits should not be used for disposal of other kinds of waste.[127]

1.55.6 Under Section 31 of the RMA, regional councils are responsible for the discharge of contaminants into or onto land or in a manner that could enter water. The effects of concern are therefore effects relevant to the responsibilities of Environment Southland rather than territorial authorities.

1.55.7 The disposal of agricultural waste to land is of interest to tangata whenua as this is a widespread activity that has significant effects on water quality.

1.55.8 It is now considered inappropriate to consider the effects of activities such as the disposal of agricultural waste without having regard to effects on water quality and amenity values. It is suggested that this issue be amended to reflect this, for example:

> *The incorrect disposal of agricultural wastes to land, including dairy and piggery shed effluent, offal pits and silage pit leachate, can have adverse effects on soil resources, water quality and amenity values.*

1.59 Objectives Relevant to Issue 8.4

1.59.1 Objective 8.1

To promote the sustainable management of all soils.

1.59.1.1 Objective 8.1 is relevant to Issue 8.4 because discharges of agricultural wastes to land may have effects that threaten the long term values of the soil resource through phenomena such as excessive build up of salts in the soil profile.[128]

1.59.2 Objective 8.4

To avoid contamination of soils.

1.59.2.1 Objective 8.4 is relevant to Issue 8.4 because excessive applications of animal waste may result in adverse effect, including accumulation of salts such that there are adverse effects on plant growth or animal health.

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127 Dairy NZ Farm Fact 5-5 Farm Dumps and Offal Pits. [online] dairyna.co.nz

128 United States Department of Agriculture Soil Conservation Service (1992) Agricultural Waste Management Field Handbook. Chapter 5. Role of Soils in Waste Management.

1.60 **Policies Relevant to Issue 8.4**

1.60.1 **Policy 5.4**
Utilise land treatment of liquid wastes where this can be undertaken in a sustainable manner and without significant environmental effects.

1.60.1.1 Policy 5.4 is consistent with the wording and intent of Issue 8.4 because it represents an interpretation of this issue in a policy form.

1.60.2 **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 infrastructure used to draw such waters.

1.60.2.1 Policy 6.11 is somewhat relevant to Issue 8.4 as the effects of discharge of animal wastes to land can have severe effects on water and air quality as well as the soil resource.

1.60.3 **Policy 8.1**
Maintain and enhance Southland's soil resource by avoiding, remedying or mitigating the adverse effects of activities.

1.60.3.1 Policy 8.1 is relevant to Issue 8,4 because of the need to manage animal wastes correctly. This involves even application of effluent or manure at a controlled rate commensurate with the ability of the soil to absorb and treat waste without compromising it's primary function; to enable plant growth.

1.60.4 **Policy 8.2**
Provide for the sustainable management of the most versatile soils of the Region.

1.60.4.1 Policy 8.2 is relevant to Issue 8.4 because versatile soils may be the site of intensive production involving discharges of animal waste to land. As with other soils it is important that over-application be avoided to sustain the life-giving capacity of the resource and to ensure nutrients are returned to the soil.

1.60.5 **Policy 8.5**
Promote land use practices which avoid the contamination of soils.

1.60.5.1 Policy 8.5 is relevant to Issue 8.4 because of the potential for application of animal wastes to cause adverse effects such as accumulation of harmful salts in the soil. Management techniques such as soil tests and control of application rates may be necessary to prevent build up of contaminants arising from disposal of animal wastes to land.

1.61 **Issue 8.5**

While the causes of many of the adverse effects from the use of the soil resource are known, information on the impacts of some land use activities, particularly those relating to different farming types and forestry, is not complete, and little research has been carried out in order to identify sustainable land use practices that will avoid the adverse effects of those land use activities.
Refer to Objectives 6.4, 8.1, 8.3; Policies 6.2, 8.2, 8.3, Methods 8.1, 8.4 – 8.11

1.61.1 Policies and Objectives that are no longer relevant: Policy 8.2

1.61.2 Issue 5 and the lack of information on the impacts of land use activities remains a relevant issue for the Southland Region. Research and improved information transfer can help improve knowledge of appropriate soil management practice and create ways for farmers to achieve effective husbandry of the soil resource.

1.61.3 Sustainable land use practices are those that result in effective husbandry of the soil resource, increased productivity of the soil and preventing erosion or loss of soil quality. Practices that may improve the productivity or versatility of the soil resource include providing shelter, installing drainage systems, irrigation, fertiliser applications, tillage methods appropriate to the situation[129], tram-lining[130] and use of installed subsurface drains.

1.61.4 On soils that are vulnerable to degradation or loss, soil retention and ground stability can be aided by the retention, or planting, of particular types of vegetation. This can be significant in alpine areas or on steep slopes in areas of high rainfall, where appropriate land use practices are necessary to avoid effects on the soil and water resource.[131]

1.61.5 In the past, lack of knowledge by land owners or the people that advise them has led to losses or degradation of the soil resource.[132] For example, some land use activities have been shown to result in contamination of soils, limiting the range of future uses or versatility of the resource.

1.61.6 There is currently very little regulatory control over land use practices. Section 5 of the RMA provides for natural resources to be managed in a sustainable manner. However, there is a need to balance the rights of the land owner to undertake activities on their land as they see appropriate with the provisions of the RMA. As

129 'Direct drilling is reported to be most successful on well drained, well structured soils and is not recommended on soils which have physical problems. It appears that 'minimum tillage' is more readily adopted than direct drilling because it avoids some of the problems and yet retains many of the disadvantages.' McLaren and Cameron (1993) ibid

130 'Tramlining' involves modifying all farm machinery to the same track width so that tractors and vehicle wheels always pass the same place. Tillage, sowing, etc is done outside and between the resulting wheel tracks, which means that most soil compaction is eliminated. Tramling has been reported as resulting in an overall increase in yield of between 8 and 13% and greater mechanical efficiency as tractors, sprayers and headers move more quickly and with less effort. All Wheels Follow the Same Path. Farm Journal, September 2004

131 Mark A. F. and Dickinson, K. J. M. (2008) Maximizing water yield with indigenous non-forest vegetation: a New Zealand Perspective. Front Ecol Environ 2008; 6(1): 25-34

132 McLaren R.G. and Cameron K.C. (1993) ibid

no generic guidelines or rules can be developed for most land types it is not practical nor fair to impose controls on land owners when management practices on one area of land can result in enhancement of that land, while on other land adverse effects result.]

1.61.7 Our knowledge of the effects of land use activities on the soil resource has improved, however further work is required and there is also a need to communicate new knowledge to land users. It is suggested that this issue be amended to reflect changes that have occurred since the drafting of the current RPS, for example:

> *The causes of some of the adverse effects from the use of the soil resource are not well understood, nor is information on enhancing and sustainable land use practices being shared effectively with land owners.*

1.62 Objectives Relevant to Issue 8.5

1.62.1 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.

1.62.1 Objective 6.4 is relevant to Issue 8.5 because improved understandings of the effects of activities in the land-water interface (riparian and near-stream areas) is required, both by resource users and regional council staff if the values of lakes, rivers and wetlands are to be maintained for future generations.

1.62.2 Objective 8.1

To promote the sustainable management of all soils.

1.62.2.1 Objective 8.1 is relevant to Issue 8.5. Improved knowledge of activities that have effects on the soil resource and ways in which these effects can be reduced or eliminated will be necessary to achieve sustainable management of the soil resource.

1.62.3 Objective 8.3

To encourage land management techniques that avoid, wherever practicable, adverse effects on air quality.

1.62.3.1 Objective 8.3 is relevant to Issue 8.5 as land use practices such as land disposal of contaminants or burning of waste can have effects on air quality.

1.62.3.2 Objective 8.3 would be more relevant in this context if it encouraged reduction in emissions of greenhouse gases. The imminent implementation of carbon trading[133]

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[133] Emission Critical Issue 6: September 2008 PricewaterhouseCoopers

means that research is now being done into land use activities and emissions of greenhouse gases or 'carbon fixing'.

1.63 **Policies Relevant to Issue 8.5**

1.63.1 **Policy 6.2**

Encourage the undertaking of research investigating the relationships between wetlands and their surrounding environment and the activities that can impact on wetlands.

1.63.1.1 Policy 6.2 is relevant to Issue 8.5 as the effects of land use activities on nearby wetlands has been identified as an area that is not well understood in a scientific sense. Resource users have also demonstrated a low level of awareness of the values of wetland areas and the ways that activities on land near wetlands (drainage and discharge of agricultural effluents for example) affects the values of the resource.[134]

1.63.2 **Policy 8.2**

Provide for the sustainable management of the most versatile soils of the Region.

1.63.2.1 Policy 8.2 does not appear to be relevant to Issue 5.5. All soils require research into best practices that will ensure the sustainable management of the resource for future generations.

1.63.3 **Policy 8.3**

Develop indicators of land sustainability to measure soil resource trends in partnership with landowners, land occupiers, communities and agencies.

1.63.3.1 Policy 8.3 is relevant to Issue 8.5 because developing indicators of land sustainability is a research activity. Although indicators of land sustainability have been developed in the form of detailed soil and climate maps for Southland, the primary focus has been facilitating economic development, not ensuring sustainable land use.[135]

1.64 **Issue 8.6**

Land use activities can have cumulative effects at points lower in the catchment, for example, effects on high and low flows, sedimentation of rivers and nutrients in watercourses and estuaries.
Refer to Objectives 4.1, 4.2, 5.2, 6.4, 8.2; Policies 8.3, 5.3, 15.3; Methods 8.1, 8.2, 8.5, - 8.11

1.64.1 Policies and Objectives that are no longer relevant: Policy 8.2

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[134] Consultation with representatives of the Department of Conservation, 19th of August, 2008.
[135] Morriss, M. (2004) Farm Management Indicators and the Environment: New Zealand Agriculture in Context. OECD Expert Meeting on Farm Management Indicators for Agriculture and the Environment, 8-12 March, 2004, Palmerston North, New Zealand.

1.64.2 Issue 8.6 is relevant in that it identifies the linkage between activities in riparian and near stream areas and water quality. In terms of cumulative effects of land use on waterways, the focus of concern is activities in riparian and near stream areas.

1.64.3 In Southland factors such as a damp climate, rolling topography, proximity to streams, an impermeable subsoil and networks of installed subsurface drains result in high vulnerability of overland flow of contaminants into waterbodies in rural areas. Improved management of riparian and near stream areas is important to minimise overland flow or discharge of contaminants such as phosphorous, nitrogen, faecal contaminants and sediments.[136]

1.64.4 Agricultural activities or events that can result in deposition of contaminants in or near streams include:

- stock access to streams
- intensive winter grazing
- cultivation
- fertilizer application
- irrigation of farm dairy effluent
- earthworks or construction
- runoff from or along farm lanes towards water crossings
- soil erosion resulting from farming off steep or easily erode able land

1.64.5 The effects of the above activities can be reduced if land users act to prevent the overland or subsurface flow of contaminants to waterways, with a particular focus on riparian and near stream areas.[137] [138] Activities in riparian and near stream areas are of particular interest in 'sensitive catchments' where contaminant loadings and proximity of intensively used land to streams means that contaminant loadings in water bodies are particularly high.

1.64.6 Activities in riparian and near stream areas are also of interest to tangata whenua because of the potential for direct or indirect discharge of contaminants to water.

136 Wilson, K. and Hughes, B. (2007) Farm Dairy Effluent: Water Quality Assessment Risk. June 2007. Environment Southland Publication no 2007-06.

137 Ministry of Agriculture and Forestry (2004) Review of Riparian Zone Effectiveness. MAF Technical Paper No: 2004/05 Prepared for MAF Policy by Stephanie Parkyn NIWA

138 Practices known to reduce runoff from riparian and near stream areas include:

- Excluding stock from streams;
- filter strips along waterway boundaries. Rule 17 of the Proposed Water Plan for Southland, requires a minimum three metre filter strip when intensive winter grazing activities are taking place;
- redirecting runoff from farm lanes;
- avoiding intensive activities such as winter grazing, cultivation or application of fertiliser close to streams.
- the creation of artificial wallows for deer.

1.64.7 The Proposed Regional Water Plan for Southland[139] contains some controls over activities in riparian and near stream areas, such as stock crossings and access by stock during intensive winter grazing activities. Other regional plans, for example, the proposed discharge plan, are able to regulate activities such as discharge of agricultural wastes or positioning of on-farm structures with relation to waterway boundaries.

1.64.8 It is suggested that issue 8.6 be substantially modified to shift the focus from cumulative effects to activities in riparian and near stream areas. This change is suggested because it is impossible to consider the cumulative effects of land use without extensive knowledge and control over the effects of activities in riparian and near stream areas and cumulative effects based approaches such as Integrated Catchment Management (refer to footnote 40) are just one way of addressing the effects of activities in riparian and near stream areas. The suggested new issue is:

> *Activities in riparian and near stream areas can have significant adverse effects on the values of waterways and streams across all land uses, soil types and climatic situations.*

1.65 **Objectives Relevant to Issue 8.6**

1.65.1 **Objective 4.1**

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

1.65.1.1 Objective 4.1 is relevant to Issue 8.6. In managing the soil resource it is necessary to consider the cumulative effects of activities in riparian and near stream areas in terms of effects on the ecological health of waterways and their ability to support the needs of future generations.

1.65.2 **Objective 4.2**

To manage the use and development of water and land resources so as, wherever practicable, to maintain and enhance flow regimes.

1.65.2.1 Objective 4.2 is relevant to Issue 8.6 as there are some land use activities such as clearance of tussock lands, water extraction for irrigation and drainage developments that can result in modification of flow regimes, and cumulative effects with activities carried out at other sites.

1.65.3 **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.

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139 Southland Regional Council (2008) Proposed Regional Water Plan for Southland.

1.65.3.1 Objective 5.2 is relevant to Issue 8.6 because land development activities, including activities in riparian and near stream areas have been identified as a threat to the ecological values of lakes, rivers and wetlands in Southland.[140]

1.65.4 **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.

1.65.4.1 Objective 6.4 is relevant to Issue 8.6 as land activities in adjacent to beds or rivers, lakes and wetlands can contribute to negative effects on water quality within a catchment.

1.65.5 **Objective 8.2**
To avoid, wherever practicable, adverse effects arising from sedimentation and nutrient runoff from land into water bodies.

1.65.5.1 Objective 8.2 is relevant because sedimentation and runoff is the primary mechanism by which activities on land create effects on the health of water bodies.

1.66 **Policies Relevant to Issue 8.6**

1.66.1 **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, remedied or mitigated.

1.66.1.1 Policy 4.5 is relevant to Issue 8.6 because in considering resource consents, local authorities may have to give regard to effects on high and low flows, sedimentation of rivers and nutrients in watercourses and estuaries.

1.66.2 **Policy 5.2**
Require all point source discharges, after reasonable mixing, to comply with water quality standards.

1.66.2.1 Policy 5.2 is relevant to Issue 8.2 because installed subsurface drains may concentrate and transport discharges to land, thus creating a point source discharge where the drain meets a waterway.

1.66.3 **Policy 5.4**
Utilise land treatment of liquid wastes where this can be undertaken in a sustainable manner and without significant environmental effects.

1.66.3.1 Policy 5.4 is relevant to Issue 8.6 because land treatment of wastes must be undertaken in the correct manner i.e. '*without significant environmental effects'*.

[140] Consultation with representatives of the Department of Conservation 19-08-08

1.66.4 **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 source and non-point source discharges, and provide for any adverse effects to be avoided, remedied or mitigated.

1.66.4.1 Policy 5.5 is consistent with and relevant to Issue 8.6 as it directs local authorities to give regard to the linkages between land use activities or changes of land use and water quality.

1.66.5 **Policy 8.2**
Provide for the sustainable management of the most versatile soils of the Region.

1.66.5.1 Policy 8.2 does not appear to be relevant to Issue 8.6. All soils can support activities that have effects on the water resource.

1.66.6 **Policy 8.3**
Develop indicators of land sustainability to measure soil resource trends in partnership with landowners, land occupiers, communities and agencies.

1.66.6.1 Policy 8.3 remains relevant to Issue 8.6 in the current context as little work has been done on indicators of land sustainability that address impacts of activities in riparian and near stream areas. Work that has been done includes detailed assessment and mapping of the soil resource[141] and water quality risk assessment work done on farm dairy effluent.[142]

1.67 **Issue 8.7**
Disturbing the ground has the potential to alter amenities and landscapes of the area, for example, opencast mining, ploughing of tussock areas and clearance of vegetation for development.
Refer to Objectives 8.1, 9.1; Policies 8.1, 9.1; Methods 8.5 - 8.12

1.67.1 Refer to Soil Loss and Soil Degradation, Forestry, Arable Farming, and Upland Areas.

1.67.2 Issue 8.7 remains relevant in the Southland context because there are a range of land use activities that involve disturbing the ground. Activities such as cultivation, winter grazing, forest harvesting, construction of electricity generation projects, roading works and the construction of urban subdivisions routinely result in disturbance of the ground. The ongoing economic development in Southland

[141] The Topoclimate Survey (1998-2001) initiated to obtain accurate information on the region's climate and soils; 'The maps and database allow land users to match crops, grasses and trees to the nature of their soil and climate resource. They will be able to make better land-use decisions based on more accurate information generated by the project. Careful interpretation of the information can become the basis for developing more intensive land uses, increasing production or improving efficiencies in existing land uses within a more sustainable framework.
[142] Wilson, K. and Hughes, B. (2007) ibid

means that open-caste mining and gravel extraction is expected to increase in scale and extent over the next few years and extensive disturbance of the ground is expected as a result.

1.67.3 Disturbing the ground can result in a range of effects:

- loss of the soil resource as topsoil is buried or becomes vulnerable to erosion;
- effects on water quality as sediments are transported to waterways;
- invasion of weeds or pest plants;
- disturbance of archaeological sites;
- loss of landscape values or scarring of the landscape;
- discharges of dust and effects on air quality;
- damage to infrastructure as landslips or erosion interfere with the function of transport, electricity and telecommunications networks;
- the creation of hazards such as holes or unstable ground for people who have access to the area.

1.67.4 Effects such as degradation of landscape values, protection of accidental finds, and protection of wahi tapu and archaeological values are all of interest to tangata whenua.

1.67.5 Activities that disturb the ground also give rise to secondary adverse effects. Quarrying, mining and gravel removal frequently utilise large scale machinery and this can result in noise affected other properties, high levels of traffic on nearby roads, damage to roads unable to cope with intensity of use or the weight of heavy vehicles, dust from any stockpiles on the land, vehicle movements or associated crushing activities.

1.67.6 The RMA provides for regional councils to manage any discharges to air and water from such activities, while territorial authorities manage the activities themselves and associated effects, other than those considered by the regional councils.

1.68 **Objectives Relevant to Issue 8.7**

1.68.1 **Objective 8.1**
To promote the sustainable management of all soils.

1.68.1.1 Objective 8.1 accurately reflects Issue 8.7 as disturbing the ground may have permanent effects on the productive and livelihood values of the soil resource.

1.68.2 **Objective 9.1**
To protect outstanding natural features and landscapes of the Region.

1.68.2.1 Objective 9.1 accurately reflects Issue 8.7 as activities that involve disturbing the ground can have substantial effects on values of natural features and landscapes.

Scars on the landscape resulting from activities such as mining are an area of particular interest to tangata whenua.

1.69 **Policies Relevant to Issue 8.7**

1.69.1 **Policy 8.1**
Maintain and enhance Southland's soil resource by avoiding, remedying or mitigating the adverse effects of activities.

1.69.1.1 Policy 8.1 is relevant to Issue 8.7 as disturbance of the ground has potential to impact on the life supporting capacity of the soil as soil is degraded, eroded, removed, buried or inundated.

1.69.2 **Policy 9.1**
Identify and encourage the protection of outstanding natural features and landscapes within Southland.

1.69.2.1 Policy 9.1 is relevant to Issue 8.7 because activities that involve disturbance of the ground can have substantial effects on outstanding natural features and landscapes. For example the limestone formation at limestone rock is currently being mined, even though it is a significant landscape feature.

1.70 **Issue 8.8**
Insufficient regard has been given to the rehabilitation of soils following disturbance from construction and excavation activities, for example, road and airport construction, silage pit construction and quarrying, which can also result in loss of the soil resource.
Refer to Objectives 8.1, 8.4, 14.2; Policies 8.1, 8.2, 8.5, 8.6, 11.4, 14.5; Methods 8.1, 8.2, 8.5 - 8.15

1.70.1 Policies and Objectives that are no longer relevant: Objective 8.4, Policy 8.5, Policy 8.6

1.70.2 Issue 8.8 is relevant in the current context. The soil has an ability to rehabilitate itself or recover following activities that degrade or lessen the values of the resource and the way the land is managed can facilitate this process. Practices that can rehabilitate or permanently improve the values of the soil resource include:

- replacement of saved topsoil and replanting following excavation activities;
- aeration and planting of a crop to improve soil structure (e.g. barley) following intensive winter grazing activities;
- construction of artificial wetlands or 'oxbow lakes' following gravel extraction activities;
- conservation tillage to build soil organic matter.

1.70.3 Rehabilitation is consistent with the concept of Kaitiakitanga or guardianship and thus of interest to Tangata whenua.

1.70.4 Where any activity that disturbs the ground is subject to a resource the RMA provides an opportunity for the consenting authority to impose conditions on that consent relating to the timing, form and outcome to be achieved from rehabilitation. Conditions can also be included in regional and district plans requiring rehabilitation of land under specified conditions, for example, with 6 months of the activity ceasing.

1.71 **Objectives Relevant to Issue 8.8**

1.71.1 **Objective 8.1**
To promote the sustainable management of all soils.

1.71.1.1 Objective 8.1 accurately reflects Issue 8.8 as failure to rehabilitate soils following disturbing the ground may have permanent effects on the productive and livelihood values of the soil resource.

1.71.1.2 Objective 8.1 might be more relevant to Issue 8.8 if some reference was made rehabilitation of soils, or practices that make rehabilitation easier once the activity is finished. This might be best achieved in the explanation for Objective 8.1: *'…sustainable management of soils extends to the rehabilitation of the resource following disturbance, or while the activity is still being undertaken…'*

1.71.2 **Objective 14.2**
To avoid, remedy or mitigate any adverse effects of mineral and energy resource development, production, use or transportation in the region.

1.71.2.1 Objective 14.2 is relevant to Issue 8.8. Avoiding, remedying or mitigating adverse effects of land use activities extends rehabilitation during and following them.

1.72 **Policies Relevant to Issue 8.8**

1.72.1 **Policy 8.1**
Maintain and enhance Southland's soil resource by avoiding, remedying or mitigating the adverse effects of activities.

1.72.1.1 Policy 8.1 is relevant to Issue 8.8 as disturbance of the ground has potential to impact on the life supporting capacity of the soil as soil is degraded, eroded, removed, buried or inundated.

1.72.1.2 Policy 8.1 might be more relevant to Issue 8.8 if some reference was made to rehabilitation of soils, or practices that make rehabilitation easier once the activity is finished. This might be best addressed in the explanation: '…remedying or mitigating adverse effects extends to rehabilitation activities undertaken when the initial activity is finished or while it is still being carried out.'

1.72.3 **Policy 8.2**
Provide for the sustainable management of the most versatile soils of the Region.

1.72.3.1 Policy 8.2 is relevant to Issue 8.8 because activities that involve disturbance of the ground are of particular concern where they result in loss or degradation of the most versatile soils in the region.

1.72.4 **Policy 8.6**
Require, where practicable, the rehabilitation of contaminated soils where there is a significant adverse effect on the environment.

1.72.4.1 Policy 8.6 is relevant to Issue 8.8. This is reflected in the explanation for this issue:

> '*Within the Region there are a number of contaminated sites, including locations where chemicals have been dumped, or timber treatment and chemical manufacturing undertaken, where discharges to the environment are taking place. Appropriate steps should be taken to protect the environment, including rehabilitation where practicable.'*

1.72.4.2 In other words resource managers must give regard to identifying and rehabilitating contaminated sites.

1.72.4.3 Policy 8.6 would be more relevant if it was supported by an appropriately worded objective.

1.72.5 **Policy 11.4**
Require district and regional plans to include provisions that avoid, remedy or mitigate the adverse effects of transportation and transportation infra-structure on natural and physical resources, so that these resources can be managed in such a way that they are able to meet the needs of future generations.

1.72.5.1 Policy 11.4 is relevant to Issue 8.8 because the construction, improvement or maintenance of the transportation infrastructure involves activities such as gravel extraction, road formation and creation of berms and cuts that result in disturbance of the ground.

1.72.6 **Policy 14.5**
Avoid wherever practicable, remedy or mitigate the adverse effects of energy production, use, transmission and distribution.

1.72.6.1 Policy 14.5 is relevant to Issue 8.8 because the construction and maintenance of energy generation and transmission infrastructural assets results in disturbance of the ground. The activity of lignite extraction for processing into fuel will likely to result in large scale disturbance of the ground.

1.78 **Issue 8.9**

Pest plants and pest animals, where not adequately managed, can adversely impact upon productivity, adversely affect landscape values, and the quality and quantity of the soil resource.
Refer to Objectives 8.1, 9.2; Policies 8.7, 9.2; Methods 8.1, 8.5 - 8.10, 8.13, 8.14

1.78.1 Issue 8.9 is relevant in the current context as pest plants and animals remain a threat to productivity, landscape values and the quantity and quality of the soil resource.

1.78.2 The proliferation of pest plants and animals causes economic losses and loss of habitat values, predation, degradation of landscapes, loss of the values of the soil resource and indirect or even direct effects on air and water quality. Pest plants and animals have effects such as:

- economic losses as pests out compete or feed on pasture or crops, or resources are expended in pest control;
- loss of habitat values occurs as pest plants and animals displace or browse indigenous vegetation;
- degradation of landscapes as pest plants spread across hillsides, valleys and riverbeds or animals such as rabbits or possums results in modification or loss of vegetation;[143]
- degradation of soils as proliferation of weed species results in difficulties in producing certain crops such as brassicas[144];
- release of soluble nitrates by legume weed species such as gorse[145];
- indirect effects as landowners or government agencies apply sprays or poisons to suppress or eliminate unwanted organisms;
- weed invasion is a problem in all wetland areas, particularly where water levels are not maintained at a natural level. Significant weeds include gorse, silver birch, and service berry which thrive in the low nutrient, acid soils, and are encroaching from the margins in towards the centre of some peat bogs.

1.79 **Objectives Relevant to Issue 8.9**

1.79.1 **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.

1.79.1.2 Objective 2.1 is relevant to Issue 8.9 because pest plants and animals can have substantial effects on the values of natural or unproductive areas, including effects that result in loss of quality of the soil resource. For example the weed heiracium

143 Consultation with Richard Bowman 18-09-08

144 Fleming, P.H. and Burtt E.E (1991) Farm Technical Manual. Farm Management Department, Lincoln University, Canterbury, New Zealand.

145 Dairy Exporter (2008) Gorse the new N bad guy. Dairy Exporter October 2008 p 42

colonises high country areas, effectively degrading the values of these soils by making these soils useless for any purpose; either as productive land or provision of ecosystem services.

1.79.2 **Objective 8.1**
To promote the sustainable management of all soils.

1.79.2.1 Objective 8.1 is relevant to Issue 8.9 because sustainable management of the soil resource extends to the management of pest plants and animals. Lack of effective control will lead to loss of versatility and productive value of the soil resource as these organisms accumulate in the environment.

1.79.3 **Objective 9.2**
To avoid, remedy and mitigate adverse effects on ecosystems which contribute to the diversity of landscapes in the Region.

1.79.3.1 A variety of ecosystems contribute to the landscape values of the environment. Pest plants and animals have potential to modify the species makeup of these ecosystems with consequent effects on landscape values.

1.80 **Policies Relevant to Issue 8.9**

1.80.1 **Policy 8.7**
Reduce the adverse effects of pest plants and pest animals on the soil resource.

1.80.1.1 Policy 8.7 is consistent with the wording and intent of Issue 8.9. This is reflected in the explanation:

1.80.1.2 'Pest plants and pest animals need to be managed in order to reduce adverse environmental effects, and impacts upon productivity and the quality of the soil resource.'

1.80.2 **Policy 9.2**
Promote, and where appropriate provide for, the protection of significant trees, areas of indigenous forests and scrublands, groups of trees, wetlands and tussock lands which contribute to the diversity of landscapes within the Region.

1.80.2.1 Policy 9.2 is somewhat relevant to Issue 8.9 as a number of pest plants and animals (possums for example) are very destructive of indigenous vegetation.

1.80.2.2 Policy 9.2 might be of more relevance if the focus was shifted to preservation of indigenous vegetation, particularly vegetation such as tussocklands and wetlands that are threatened by land development activities in or near them. For example: *'promote and where appropriate provide for areas of indigenous vegetation, particularly areas such as wetlands and tussocklands that provide essential ecosystem services.'*

1.81 **Issue 8.10**

The uncontrolled introduction of new organisms could have potential adverse effects on soil resources.

Refer to Objective 8.1; Policies 8.7; Methods 8.1, 8.10

1.81.1 Issue 8.10 remains relevant in the current resource management context as the spread of pest plants and animals continues to pose a threat to economic habitat values of the soil and water resource.

1.81.2 Under the staged management approach adopted under the pest management strategy[146], priority is given to preventing new pests from becoming established in the region. Environment Southland considers prevention is a more effective use of resources than extermination or suppression of pest plants and animals once they become established in the region.

1.81.3 New organisms may be introduced into Southland as a result of:

- the genetic modification of plants and animals;
- the introduction of plants and animals not previously found in Southland, either for economic return or as a means to eradicate or control some other plant or animal;
- travel by sea, the wind or introduction from migratory species;
- by the careless or deliberate actions of a person travelling to Southland from overseas.

1.81.4 Where there is a deliberate introduction of a plant or animal to the Region care is required to ensure that the consequential ecological effects are not adverse. Legislation places safeguards in place in an attempt to avoid any adverse effects. However, legislation cannot protect the Region from introduction by "accident", intent or accident.

1.82 **Objectives Relevant to Issue 8.10**

1.82.1 **Objective 8.1**

To promote the sustainable management of all soils.

146 Southland Regional Council has adopted a 'staged management approach' with established pest plants and animals. This approach recognises that the most economically efficient way to control pests is to prevent their establishment in the first instance. As a consequence, priority is given to preventing invasion or exterminating new arrivals, before a population can build up. Thus 'eradication pests' or 'exclusion pests' are managed by Environment Southland and 'containment pests' and 'suppression pests' are managed by landowners, with the regional council undertaking compliance and education. Examples of containment or suppression pests include possums, nodding thistle, gorse, heiracium, rabbits, hares, pigs, deer, goats, stoats, weasels and ferrets. Examples of exclusion or eradiation pests include banana passionfruit, Himalayan thar and wallabies (exclusion pests), and rooks and spartina (eradication pests). See 'Regional pest Management Strategy for Southland' (2007)

1.82.1.1 The introduction of new pests is an issue of concern for all soils. Introductions of new pests should be anticipated and prevented to maintain the versatility of the soil resource for future generations.

1.83 **Policies Relevant to Issue 8.10**

1.83.1 **Policy 8.7**
Reduce the adverse effects of pest plants and pest animals on the soil resource.

1.83.1.1 Pest plants and animals have a range of undesirable environmental and economic effects. While the regional council can do little to manage existing pest plants and animals, it is believed that much can be done to prevent the invasion of pests and that a relatively low expenditure of resources now will prevent substantial economic and environmental losses.

1.84 **Issue 8.11**
Wahi tapu and wahi taoka are not being protected from the effects of activities on the land.
Refer to Objectives 8.5, 1.1 - 1.4; Policies 8.4, 1.1, 1.2; Methods 8.1, 8.4, 8.8 - 8.11, 8.14

1.84.1 Policies and Objectives that are no longer relevant: Policy 1.1, Policy 1.2

1.84.2 The lack of protection for wahi tapu and wahi taoka remains an issue of concern for the region.

1.84.3 The Natural Resource and Environmental Iwi Management Plan 2008 "Te Tangi a Tauira (The Cry of the People)" sets out the values and principles of the tangata whenua of Southland. In the context of land a key issue is the lack of protection for wahi tapu and wahi taoka. Activities or effects of concern include:

- developments on marginal areas such as wetlands, boggy areas and high country tussocks.
- degradation or loss of wetlands, riparian margins or native bush remnants
- protection of significant cultural values on pastoral lease lands
- lack of support to landowners who choose to preserve indigenous vegetation
- effects on flora, fauna, air, water, mahinga kai, species and places.
- lack of pest control on high country areas
- impacts on mauri of freshwater lakes/rivers
- runoff of sediments
- impacts on nesting or roosting birds
- access to mahinga kai
- access for removal of pounamu and food gathering
- accidental finds
- disturbance or loss of culturally significant sites
- consultation with Iwi and others
- mining in areas or landscapes with cultural significance

- rehabilitation and habitat enhancement following mining activity
- scars on the landscape

1.84.4 A variety of land use/rural issues are of interest to the tangata whenua. These include mining, cultivation or land clearance, restrictions on access, peri-urban expansion, activities in riparian or near stream areas, protection of wetland areas, protection of indigenous species and ecosystems and climate change.

1.84.5 The RMA requires those exercising functions and powers under it (territorial authorities and regional councils, Ministers of the Crown, and their departments) to recognise and provide for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga (section 6), to have particular regard to kaitiakitanga (section 7), and to take into account the principles of the Treaty of Waitangi (section 8).

1.84.6 The relationship between tangata whenua values and land use/rural issues is interwoven throughout this document.

1.84.7 It is suggested that issue 8.11 be amended to emphasize the region-wide changes now occurring and the implications of this for tangata whenua, for example:

> *Wahi tapu and wahi taoka are not being protected from the changes occurring in the region, including the effects of activities on the land.*

1.85 **Objectives Relevant to Issue 8.11**

1.85.1 **Objective 1.1**
To protect wahi tapu from the adverse effects of resource use activities.

1.85.1.1 Objective 1.1 is relevant to Issue 8.11 as land use activities have broad scope to interfere with wahi tapu such as burial sites, sacred places or other culturally significant aspects of the land such as archaeological sites and landscapes.

1.85.2 **Objective 1.2**
To recognise the importance of wahi tapu, wahi taoka, mahika kai and the customary use of water to Kai Tahu.

1.85.2.1 Objective 1.2 is relevant to Issue 8.11 as land use activities, specifically land development and agricultural intensification have been identified as a key driver of decreasing water quality in Southland. Discharge of waste directly to water is seen as particularly offensive to Maori and as such should be avoided and while the effects of many point source discharges have been addressed, concern remains around intensification on areas of land with installed subsurface drains that discharge to waterways.

1.85.3 **Objective 1.3**

To incorporate Maori cultural and traditional spiritual values where appropriate into resource management decision making processes.

1.85.3.1 Objective 1.3 may not be relevant to Issue 8.11 as the way that the cultural heritage of Maori applies to resource management decisions has been extensively developed and supported through the document Te Tangi a Tauira.

1.85.4 **Objective 1.4**

To have particular regard to the concept of kaitiakitanga in relation to managing the use, development and protection of natural and physical resources.

1.85.4.1 Objective 1.4 accurately reflects Issue 8.11 as the concept of kaitiakitanga is highly applicable to the effects of activities on land, including effects on wahi tapu and wahi taoka.

1.85.5 **Objective 8.5**

To avoid, remedy or mitigate any adverse effects of the use or development of land on wahi tapu, wahi taoka and archaeological sites.

1.85.5.1 Objective 8.5 is consistent with the wording and intent of Issue 8.11. This policy provides clarification of the key threats of land use activities to tangata whenua values as well as providing a development of the issue into a policy goal.

1.86 **Policies Relevant to Issue 8.11**

1.86.1 a **Policy 1.1**

Prepare and implement an Accord between the local authorities and the tangata whenua o Murihiku which sets out a process for consultation.

and…

b **Policy 1.2**

Recognise "Te Whakatau Kaupapa O Murihiku" as a Kai Tahu resource management reference planning document for the Region.

1.86.1.1 Policies 1.1 and 1.2 may no longer be relevant now that Te Tangi a Tauira is operative as a working document. Te Tangi a Tauira is specifically designed to enable participation of Ngai Tahu ki Murihiku in the planning process:

> *'(It) enables councils to ensure Ngai Tahu ki Murihiku issues and policies are provided for in planning documents and determines the nature and extent of consultation required.'*[147]

[147] The Cry of the People, Te Tangi a Tauri. Ngai Tahi ki Murihiku. Natural Resource and Environmental Iwi Management Plan 2008.

1.86.1.2 Te Tangi a Tauira is relevant to virtually all rural land issues in Southland and provides valuable input into the development of issues and policies relating to land use in regional and district plans.

1.86.2 **Policy 8.4**

Recognise and provide for Maori cultural and traditional spiritual values and consult the tangata whenua, when making statutory decisions on soil issues and preparing a Regional Sustainable Land Management Plan.

1.86.2.1 Policy 8.4 accurately reflects Issue 8.11 as consultation is needed to develop a fuller understanding of the way that land use activities impact on tangata whenua values.

1.87 **Methods**

1.87.1 **Method 1 - Information, education and public awareness (Soils)**

Public education and provision of information will lead to a better understanding and a general awareness of the values of soils and lake, river and wetland ecosystems. Understanding of the land, its dynamic nature and the way that it reacts to human activities is not fully understood, either by landowners or scientists. It may never be possible to fully understand the dynamics of land and water resources, but by sharing knowledge and providing information, community understanding of the need for sustainable land use management will be developed. If resource users consider themselves as the guardians, or Kaitiakitanga, of the land for future generations, then sustainability of the soil resource will be easier to achieve.

1.87.1.1 Method 1 is relevant to the issues raised in Chapters 6 and 8 as information, education and public awareness is necessary to achieve protection of natural resources.

1.87.1.2 The variety of soil types and land use practices, as well as the wide variation in competence of resource users means that education and public awareness[148] are necessary to protect the soil resource. The soil resource will be better protected if resource users are knowledgeable of the resource and actively encouraged to develop an ethic of stewardship.

1.87.1.3 A lack of public understanding of the values and vulnerabilities of lakes, rivers or wetlands appears to be one of the drivers of degradation and loss of these resources. Topic areas where information, education and public awareness may be useful include:

- the values of wetland areas;
- the relationship between habitat values and the quality and abundance of the fisheries resource;
- sustainable harvesting from lakes, rivers and wetlands;

[148] Veríssimo A. and Woodford K. (2005) TOP PERFORMING FARMERS ARE INFORMATION RICH: Case Studies of Sheep and Cattle Farmers in the South Island of New Zealand. *Published in the Proceedings of the Fifteenth International Farm Management Association Congress, Campinas, Brazil, August 2005, Vol 1, pp.365-368*

- the effects of runoff or discharge of contaminants from riparian and near stream areas;
- clearance of the ground (forest harvesting, winter grazing, cultivation or burning) and the large scale sedimentation that can result;
- the need to respect the rights of access by those who wish to use the water resource.

1.87.2 **Method 2 - Promotion**

This technique can be used to promote the maintenance or enhancement of the sustainable capabilities of the land by, for example:

- *Organising field days to demonstrate appropriate practices;*
- *demonstrating wise use of herbicides and pesticides;*
- *encouraging alternative land management practices;*
- *planting of riparian vegetation;*
- *the adoption of sections of lakes, rivers and wetlands, in order to keep them tidy and increase amenity values.*

1.87.2.1 Method 2 is relevant to the issues raised in Chapters 6 and 8 because promotion is a useful way of communicating the linkages between land use activities and environmental quality. Ways that promotion may be used to protect and enhance the soil resource include:

- improved management of effluents and manures accumulated on farms;
- improved riparian management;
- communicating how mitigation practices or rehabilitation works are to be carried out in the field.

1.87.3 **Method 3 - Advocating**

From time to time it will be necessary to advocate certain courses of action, for example, to manufacturers and suppliers of herbicides and pesticides, regarding the need for them to carry out an information and education role for users of their products, with a view to minimising the likelihood and potential for contamination of soils and off-site environmental effects.

1.87.3.1 Method 3 is relevant to the issues raised in Chapters 6 and 8 as the involvement and cooperation of industry has proven to be an effective way of creating behavioural change.

1.87.3.2 For example, suppliers of herbicides and pesticides are likely to be aware of potential effects of inappropriate use and disposal of their products, as well as having a distribution and information transfer system that can be used to inform farmers. Another example of advocacy is the widespread uptake of the practice of compiling and applying nutrient budgets driven by the fertiliser industry.

1.87.4 **Method 4 - Consultation**

Consultation with the tangata whenua, interest groups, adjoining landowners, statutory bodies and interested people and groups is essential if objectives and policies are to be achieved. Statutory bodies cannot operate in isolation and consultation helps see different views and perspectives.

1.87.4.1 Method 4 is relevant to the issues raised in Chapters 6 and 8. The knowledge of the values of the resource gained through consultation with tangata whenua, members of industry, statutory bodies, community groups and the general public is fundamental to making good decisions. In the past, consultation has been used to build understanding of:

- improved understandings of the land use practices and understandings of how resource users can act to maintain or build the values of the soil resource;
- values associated with amenity and landscapes that may be affected by activities such as disturbance of the ground;
- the values and vulnerabilities of wetlands;
- the effects of construction of or modifications to flood alleviation and river management works, community drains and other infrastructural assets.

1.87.5 **Method 5 - Developing guidelines for resource users**

In order to ensure the sustainability of the soil resource and to avoid, remedy or mitigate any adverse effects of activities on the wider environment, it is appropriate to prepare and seek the implementation of guidelines outlining the manner in which particular activities are undertaken. Such guidelines can relate to activities on particular types of sites, for example, ploughing sloping land or disturbing high country ground to construct tracks and fences, or to the manner in which particular activities are undertaken, for example, mining, disposal of dairy shed effluent, disposal of piggery effluent and drain maintenance. Such guidelines can also provide information on the appropriate means of undertaking particular activities and thereby assist landowners, for example, the development of nutrient budgeting techniques. Where guidelines affect specific industries, they will be prepared in consultation with that industry, and means examined to ensure adoption by those within that industry.

1.87.5.1 Method 5 accurately reflects the issues raised in Chapters 6 and 8. Guidelines are a useful means of communicating to resource users why and how they should implement certain practices.

1.87.5.2 Given the difficulty in controlling how soil is treated in the course of agricultural activities through legislation[149], guidelines and information transfer become an important means of communicating to resource users why and how they should implement practices that enhance the value of the soil resource, for example:

- managing the discharge of contaminants;

[149] Sustainability of Agricultural Systems regarding Nutrient Losses. A report to the New Zealand Nuffield Farming Scholarship Trust. Vaughan Templeton. November 2007

- preventing effects associated with disturbance of the ground or rehabilitation work undertaken once the activity in question has finished;
- rehabilitation practices;
- management of riparian or near stream areas;
- proper construction of on-farm bridges, crossings or lanes;

1.87.6 **Method 6 - Protocols and accords**

Develop protocols between consent agencies on areas of responsibility with regard to the processing of applications. Also, reach accords with industries and sector groups relating to, for example, the preparation of waste management codes of practice for the disposal of liquid and solid wastes to land, management of activities within the beds of rivers and gravel extraction.

1.87.6.1 Method 6 is relevant to the issues raised in Chapters 6 and 8.

1.87.6.2 In cases where local authorities share responsibility for a freshwater resource and it may be necessary to have a common vision to achieve effective resource management. Accords or agreements may be one way of achieving this.

1.87.6.3 Ideally, the relevant authorities can come to agreement on how the values of the resource are defined, how they are protected and how resources are assigned to management. It may also be necessary for regional and district councils to negotiate respective areas of responsibility in controlling land use activities that result in degradation or loss of the soil resource.

1.87.6.4 Accords or codes of practice may also be an effective method when a specific group (such as gravel extraction operators) has a vested interest in sustainable use of the resource, but require direction and support to achieve this. The concept of using accords to manage common resources might be extended to whole catchment management, whereby groups of resources agree to share responsibility for stream health within a catchment.

1.87.7 **Method 7 - Investigations and research**

Where insufficient is known about a resource, for example, wetlands or fluvial gravel resources, it is appropriate to carry out research to expand knowledge and understanding.

Maps of the most versatile soils of the Region, that clearly show their location and extent, will be prepared. Investigations will also need to be carried out in order to identify at a catchment and farm scale the location, extent, present use and tenure of all land within the Region on which particular activities, for example, agriculture, forestry or urban development, cannot be carried out on a sustainable basis. Research is needed into alternative land management techniques and practices which can be carried out on a sustainable basis.

1.87.7.1 Method 7 is relevant to the issues raised in Chapters 6 and 8.

1.87.7.2 Research and development of *'alternative land management techniques and practices which can be carried out on a sustainable basis'* may be necessary to prevent ongoing soil degradation and loss. Future research might investigate topic areas such as:

- reducing the effects of disturbance of the ground;
- reducing the effects of intensive land use activities;
- development of alternative land management techniques and practices;
- identifying and/or quantifying the effects of land use activities in riparian and near-stream areas;
- developing new understandings of waste management.

1.87.7.3 Although knowledge of the dynamics of stream health and the linkages between human activities and the viability of fish populations has improved since the RPS was made operative, investigations and research remain relevant. Research may be necessary to achieve understandings of:

- flow regimes and water levels of lakes, rivers and wetlands;
- the values of lakes rivers and wetlands and activities that may threaten those values;
- interactions or activities between or within different types of waterbodies (groundwater-surface water interactions for example);
- the capacity or ability of lakes, rivers and wetlands to resist ecological change and/or assimilate, process or remove contaminants;
- the extent or level of threat to privately owned wetland areas;
- regional gravel resources and the effects of extraction from those resources;
- developing effective and efficient mitigation practices at the farm level;
- the cultural, economic and ecological values of the resources being harvested from lakes, rivers and wetlands;
- negative effects that result from access, vegetation removal or harvesting.

1.87.8 **Method 8 - Monitoring**

Where necessary, to monitor the environmental condition of the lakes, rivers and wetlands of the region, for example, surveys of fluvial gravel resources and monitoring the relationship between gravel extraction and natural sediment transport rates.

1.87.8.1 This method appropriately reflects the Issues raised in Chapters 6 and 8. Given the complexity of the hydrological system, it is very difficult to model the effects of activities of initiatives across the whole region. In many cases, it is only through observing effects through monitoring that changes to flows, water levels and water quality over time can be detected and the effectiveness of resource management assessed. Regionally significant activities or resources that benefit from monitoring include:

- ecosystem health and food gathering values within wetlands;
- the activity of gravel extraction may result in effects such as alteration of amenity and instream values, ecological flows and bank stability;

- vegetation clearance or landscape modification;
- flood protection, river management works and drain maintenance.
- losses or modifications to the soil resource as changes occur in the way land is used.

1.87.9 **Method 9 - Prepare, implement and administer a Regional Sustainable Land Management Plan**

It is the role of territorial authorities to manage the effects of the use, development or protection of land and associated natural and physical resources within their district, having regard to the matters set out in the Act. Within that framework there will be a need to identify the manner in which certain activities are undertaken in order to ensure the sustainability of the soil resource. This will generally be achieved through district plans.

Where issues of regional significance occur, such as burning in high country areas or clearance of indigenous forest, there is a need to address them in a regional plan. A range of techniques could be adopted within a regional plan, including indicators of land sustainability, accords, guidelines and, in limited instances, rules. Such a plan would therefore seek to enable activities which do not reduce the potential productivity of soils and make a positive contribution to the development and use of the soils within the Region. In order to promote integration across all the land resources this plan will also need to consider landscape and biodiversity issues.

1.87.9.1 Method 9 appears to be relevant to the issues raised in Chapters 6 and 8. The types of activities carried out on land and the effects on the values of the land resource will be a primary focus of any Regional Sustainable Land Management Plan developed by a regional or district council. A sustainable land management plan may include provisions for:

- protection or controls on use of versatile soils;
- supporting research to build understandings of the effects of land activities;
- recognising and addressing the linkages between land use activities and water quality, including cumulative effects that may occur along the reaches of water bodies;
- rehabilitation of land following disturbance.

1.87.10 **Method 10 - Prepare, implement and administer Regional Plans**

Making appropriate provision for the protection of natural character, heritage values and the outstanding features of lakes, rivers and wetlands in the Region in the Regional Coastal Plan, Regional Water Plan, Regional Sustainable Use Plan and others that are prepared.

1.87.10.1 This method supports the Issues identified in Chapters 6 and 8 in that it directs those developing regional plans to make provision for protection of the values of the natural resources of the region. Regional plans may address matters such as:

- preventing unsustainable discharges to land;
- preventing degradation and loss of the soil resource;
- managing discharges of animal waste to land;
- determining the need for and give support to further research;

- addressing cumulative effects of land use on waterways;
- preventing loss of amenity values and landscape values;
- restorative works following cessation of an activity.

1.87.11 **Method 11 - Prepare, implement and administer District Plans**

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 achieving lake, river and wetland management objectives. Particular areas where co-ordination is needed include:

- *the need for consistency in preserving the natural character of lakes, rivers and wetlands*
- *the need for district planning to recognise the effects that land and waterbased activities and subdivision can have on lakes, rivers and wetlands*
- *the need for policy and administrative co-ordination where land and waters meet*
- *land-based infrastructural requirements for water-based activities*
- *access provision, including requirements for esplanade reserves when land is subdivided*
- *consultation with tangata whenua and their participation in decision-making*
- *cumulative effects of discharges on a waterway.*

1.87.11.1 This method is relevant to Issues identified in Chapters 6 and 8 in that it directs those developing district plans to coordinate with regional councils to achieve effective protection of the natural resources of the region. Central government initiatives[150] may result in Environment Southland working closely with territorial authorities in managing lakes, rivers and wetlands or land-based ecosystems that affect these resources. Matters that may require regional-district coordination include:

- management of the gravel resource so as to ensure the demand for gravel needed to maintain economic growth is met while avoiding effects on lakes, rivers and wetlands;
- the regional issues around large scale activities such as the extraction and processing of lignite;
- guidance and direction to achieve sustainable prei-urban expansion;
- reducing time, money and uncertainty spent on compliance in matters where there is overlap between urban and district (for example consents for construction and use of on-farm structures.;
- the effects of construction and use of electricity generation projects.

1.88.12 **Method 12 - Plans, other documents and action under other Acts.**

Certain reserve areas are required to have management plans prepared, outlining strategies for their future protection and management. Conservation Management Strategies, Conservation Management Plans and the Fiordland National Park Management Plan can also include provisions that will assist in avoiding, remedying and mitigating adverse effects on lakes, rivers and wetlands.

[150] Proposed National Policy Statement on Fresh Water Management and Proposed National Environmental Standard on Ecological Flows and Water Levels.

There will be a need for management plans and strategies prepared under other Acts, for example Biosecurity Act 1993 and Reserves Act 1977, to provide for appropriate land management or pest plant and pest animal management measures which maintain or enhance the soil resource.

1.88.12.1 Method 12 is relevant to the issues raised in Chapters 6 and 8.

1.88.12.2 Reserve areas may also contribute ecosystem services. Flows of water pass through a variety of environments and the way reserve areas are managed or the type of vegetation present can influence water quality, flows and water levels and sedimentation.

1.88.12.3 Many reserve areas include provision for access so that resource users can enjoy the resource while minimising environmental effects.

1.88.12.4 Parks and reserves are important for species that have a low tolerance to the effects of human activities in or near waterways. For example, Fiordland National Park is an important refuge for the long finned eel, a species that has gone into rapid decline in most parts of New Zealand.

1.88.13 **Method 13 - Resource consents**

Preparation and consideration of resource consents shall consider the effect of proposed activities on the soil resource. Conditions on consents may need to relate to monitoring and rehabilitation for different land use activities. Many of the activities carried out within, on or near lakes, rivers and wetlands may not be permitted activities in Regional and District Plans and may, therefore, require resource consents. In preparing and considering resource consents, for example, for gravel extraction, regard shall be given to effects on lakes, rivers and wetlands.

1.88.13.1 Method 13 is relevant to the issues raised in Chapters 6 and 8 as resource consents are one way of controlling the circumstances under which activities can be carried out. Resource consents may place conditions or controls on activities such as:

- degradation or loss of versatile soils;
- discharge of contaminants to land;
- degradation or loss of less versatile soils;
- discharges of animal waste to land;
- loss of amenity or landscape values;
- provision for restorative works once the activity is finished.
- assessment and protection of wetland resources at sites of landuse change;
- gravel extraction activities;
- activities within or near riparian areas;
- land clearance and landscape modification or similar activities;
- construction and use of hydro-electric plants;
- flood protection and river management works, and community drains;
- commercial harvesting from natural areas.

1.88.14 **Method 14 - Public works**

In some instances it is more efficient and effective for local authorities to carry out works on behalf of landowners to ensure that they are programmed, and crossboundary effects are minimised, for example, flood protection works.

1.88.14.1 Method 14 is relevant to the issues raised in Chapters 6 and 8 as public works might result in degradation and loss of the soil resource, discharges of contaminants or modifications of the beds of lakes, rivers and wetlands. It is necessary to allow for matters such as rehabilitation following public works and access to enable drain maintenance.

1.88.15 **Method 15 - Economic instruments**

In some instances it may be appropriate for landowners to be paid or subsidised to carry out certain works, for example, riparian fencing, or given rates relief or some other form of compensation, for protection of important habitats. It may also be appropriate to waive fees for the processing of resource consent applications which have the effect of protecting wetlands.

1.88.15.1 This method appropriately reflects the Issues identified in Chapters 6 as it encourages landowners to protect water resources. Ways in which economic instruments might be applied include:

- protecting critical wetland areas;
- assisting with restoration work or habitat improvements at sites of former gravel extraction activity;
- facilitating access for those who wish to enjoy the resource;
- maintaining ecosystem services provided by high country grasslands.

1.88.15.2 Method 15 is of limited relevance to the issues raised in Chapter 8 as soils are in themselves economically very valuable and administration costs of economic instruments can be very high.[151]

1.88.16 **Method 16 - Assistance**

Assistance can be given to community-based organisations, for example, Landcare groups, by providing logistical and technical support, including advisory services on sustainable land management practices and techniques, and information on shelter and erosion-control tree planting establishment and maintenance, riparian tree planting and cultivation techniques on erosion-prone soils. Community-based organisations can be very effective as they allow for the inclusion of valuable local knowledge, and are well-placed to advise statutory bodies and landowners of the types of land management practices that are suitable for their area, thereby encouraging individuals to take personal responsibility.

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

[151] *Integration of Conservation and Farm Production August 2007* A project completed as part of a 2006 Nuffield Scholarship by Ben Todhunter

plants and pest animals in those areas. Free advice can also be given where this will assist in achieving the objectives and policies of the Regional Policy Statement.

1.88.16.1 This method appropriately reflects the Issues identified in Chapter 6 as the regional council has substantial knowledge resources that can be applied to assist those undertaking activities that may have effects on lakes, rivers or wetlands. The difficulty with this approach is that public resources are finite and only so much assistance is available from the regional council.

1.88.17 **Method 17 - Delegations and Transfer of powers**

In some instances, for example following public consultation, it is appropriate to delegate the day-to-day management of some functions to local bodies or other organisations that can carry them out more efficiently than the body with a statutory responsibility.

1.88.17.1 This method appropriately reflects the Issues identified in Chapters 6 and 8 as it recognises the value of delegation for management of some functions to a body outside the regional council if this will result in increased efficiency and effectiveness. Examples include research activities undertaken by AgResearch and extension activities undertaken by Dairynz and fertilizer companies.

1.88.18 **Method 18 - Ownership**

In cases where areas within and adjoining lakes, rivers and wetlands are of high recreational or conservation value, for example, significant wetlands, it may be appropriate that they be held in public ownership.

1.88.18.1 This method appropriately reflects the Issues identified in Chapters 6 and 8 in that some resources may be best protected by being put into public ownership (riparian areas or wetlands for example). The difficulty with this approach is that even marginal land such as undeveloped wetlands is very valuable.

1.88.19 **Method 19 - Classification of Water**

The classification of water is an appropriate technique to provide standards for all activities to comply with. Standards will vary between areas, depending upon the activities being managed within the water bodies.

1.88.19.1 This method appropriately reflects the Issues identified in Chapters 6 and 8. Although classifications of the various water bodies in Southland have been done as a part of the Proposed Regional Water Plan, this issue remains relevant because shifting knowledge or perceptions of the values of lakes, rivers and wetlands means that the way the various classifications of water are managed may change over time. An example of this is the classification system currently being developed for sensitive catchments.

1.88.20 **Method 20 - Water Conservation Orders**

The Act provides for the issuing of Water Conservation Orders, and these can be used to protect values of lakes, rivers and wetlands and achieve some of the objectives and policies of the Regional Policy Statement.

1.88.20.1 This method appropriately reflects the protection aspect of the Issues identified in Chapters 6 and 8 as it is important that regional plans do not conflict with water conservation orders.