

8

The Beds and Margins of Lakes and Rivers



8.1 Introduction

The beds and margins of Otago's lakes and rivers are complex and dynamic natural systems. These systems provide diverse habitats for plants and animals, valued mahika kai, and opportunities for recreational use. Their outstanding natural features and landscapes are an integral part of the natural character of the region. The many waahi taonga and waahi tapu sites found on Otago's lake and river margins are of considerable spiritual significance to Kai Tahu. Many pre-European sites may be of archaeological importance. Beds and margins of lakes and rivers also contain a wealth of post-1840 heritage values and resources.

The beds and margins of lakes and rivers are currently used by Otago's people and communities for recreational activities, primary production, navigation, hydro-electric power generation and flood mitigation. Mineral resources contained within these areas, particularly aggregate and gold, are extracted. Residential, commercial and industrial uses may occur in or close to the beds of lakes and rivers. Development also occurs in relation to the need for roads, rail, energy transmission, tele-communications and other services to cross them.

The potential exists for conflicts in resource use on the beds and margins of Otago's lakes and rivers because of the dynamic nature of water flow, sediment transport and flooding, and the diverse range of human activities occurring in these areas. There is therefore a need for management of human activities on the beds and margins of lakes and rivers to avoid, remedy or mitigate their adverse effects, including cumulative effects.

This Plan provides policy and rules in relation to the bed of any lake or river for:

- the use, erection, alteration, extension, removal or demolition of structures;
- bed disturbance;
- the introduction of vegetation;
- the deposition of any substance;
- drainage or reclamation; and
- the removal of any plants.

Appropriate use and management of riparian areas is of importance in the achievement of better water quality and aquatic habitats, and for the maintenance and enhancement of amenity values of lake and river environments. The Plan provides for an integrated approach to riparian management through application of the complementary roles of the regional council and city and district councils.

District plans provide for the integrated management and control of any actual or potential effects of the use, development or protection of land. As such they make an important contribution to riparian management, through esplanade and access provisions relating to land subdivision, and in the control of land use activities. The Regional Policy Statement for Otago and this Plan provide policy guidance to city and district councils in their management of the effects of activities in riparian areas. The Otago

Regional Council also has the option of introducing controls on land use where its policy objectives are not otherwise met.

Note: 1. The provisions in this chapter are in addition to those in Chapter 5, which seek to maintain or enhance the natural and human use values supported by lakes and rivers.
2. Chapter 10 provides for the management of wetlands.

8.2 Issues

8.2.1 **Changes in the nature of the flow of water and sediment caused by activities in, on, under or over the bed or margin of a lake or river, can adversely affect:**

- (a) **The stability and function of existing structures;**
- (b) **The bedform of the lake or river;**
- (c) **Bed and bank stability; and**
- (d) **Flood carrying capacity.**

Explanation

The following activities in, on, under or over the bed or margin of a lake or river may alter the hydrological or sediment processes which act within a lake or river:

- (a) The use, erection, alteration, extension, removal or demolition of structures;
- (b) Bed disturbance;
- (c) The introduction, disturbance or removal of vegetation;
- (d) The deposition of any substance; and
- (e) Drainage or reclamation of the bed.

Such alteration can arise through the obstruction or redirection of water flow or sediment movement. These changes may exacerbate flooding by reducing channel efficiency, or may cause or worsen bed and bank instability by accelerating erosion or sedimentation. The stability or function of structures downstream on the bed or bank may also be compromised as a consequence, particularly where erosion threatens the supports of a structure. The activities may also lead to a change in the physical nature of the water body's bed (bedform), which may be undesirable if it adversely affects other uses.

Objectives: 8.3.1, 8.3.3

Policies: 8.3.2, 8.4.1, 8.6.1, 8.6.2, 8.6.4, 8.7.1, 8.8.1

8.2.2 **The disturbance of the bed of lakes and rivers has the potential to degrade water quality by reducing the clarity of water.**

Explanation

Bed disturbance includes any excavation, dredging, drilling, tunnelling, and any intentional widening, deepening or alteration of the course of a water body. Intensive use by livestock can also disturb the bed and degrade water quality. Where the bed disturbance occurs in the wet bed, that part of the bed of a lake or river which is covered by water, sediment will be mobilised. The mobilisation of sediment, depending on the scale of the activity, can reduce the clarity of the water by increasing its turbidity. Reduced clarity of water can adversely affect natural and human use values supported by the lake or river, or other users of the water body.

Objectives: 8.3.2

Policies: 8.6.1 to 8.6.3

8.2.3 The erection of a dam in, or the reclamation of, the bed of a lake or river can result in the loss of natural and human use values through their inundation or burial.

Explanation

Lakes and rivers are dammed for a number of reasons ranging from the supply of stock drinking water to the generation of hydro-electric power. Although it can lead to positive community benefits, the damming of water drowns the existing natural and human use values upstream of the dam structure, with the scale of the inundation being dependent on the size of the dam structure and the topography of the surrounding land. Similarly, although the infilling of a bed of a lake or river provides reclaimed land, which may lead to community benefits, it causes similar loss of values through burial. Given the importance of these values to Otago's people and communities, their loss through inundation or displacement may be of concern.

Objectives: 5.3.1 to 5.3.7

Policies: 5.4.10, 8.4.2, 8.5.2, 8.8.1

8.2.4 The failure or overtopping of a dam in the bed of a lake or river can result in the loss of or damage to:

- (a) **The health and safety of people and communities;**
 - (b) **Property and infrastructure; and**
 - (c) **Natural and human use values,**
- should it occur during or after the dam's erection.**

Explanation

Although dams lead to positive benefits to people and communities, they often hold large quantities of water which can lead to extensive damage if there is an uncontrolled release. Such a release could occur through a failure of the structure, or an overtopping caused by, for example, a landslide into the reservoir. The damage, which occurs largely downstream of the dam, may include loss of life, property, infrastructure, or the natural and human use values supported by the affected water bodies. The risk of damage depends on the size of the dam structure, the volume of water impounded and topography.

Objectives: 8.3.4

Policies: 8.5.3

- 8.2.5 Otago’s people and communities are subject to a significant flood hazard, which can be exacerbated by land use activities in, on, under or over the bed and margins of lakes and rivers.**

Explanation

Significant flooding can occur during periods of very high flow in many of Otago’s lakes and rivers. Defences against water have been constructed to protect the region’s people and communities from this flooding hazard for over a century. Such works are ongoing and involve the construction of new defences, such as stopbanks, and the maintenance or repair of those that already exist. Land use activities undertaken in close proximity to defences against water have the potential to adversely affect the manner in which they were designed to function, increasing the flooding risk.

Objectives: 8.3.1, 8.3.3

Policies: 8.4.1, 8.5.4 to 8.5.6

8.3 Objectives

- 8.3.1 To maintain:**

- (a) **The stability and function of existing structures located in, on, under or over the bed or margin of any lake or river;**
- (b) **The stability of the bed and bank of any lake or river; and**
- (c) **The flood and sediment carrying capacity of any lake or river.**

Explanation

Activities in, on, under or over the beds and margins of lakes and rivers have the potential to modify hydrological and fluvial processes through the obstruction or redirection of water or sediment flow. Such changes have the potential to exacerbate flooding, erosion or sedimentation hazards, and adversely affect the stability or function of structures.

Principal reasons for adopting

This objective is adopted to recognise that activities occurring in, on, under or over the bed or margins of lakes and rivers can exacerbate or create hazards by changing hydrological or fluvial processes. It is important that such hazards are avoided due to their potential threat to structures located in close proximity to the bed, and to Otago’s people and communities generally.

Policies: 8.4.1, 8.5.3 to 8.5.6, 8.6.2, 8.6.4, 8.7.1, 8.7.2, 8.8.1

- 8.3.2 To minimise reduction in water clarity caused by bed disturbance.**

Explanation

Activities in the bed or margins of lakes and rivers which involve disturbance of the bed can increase the turbidity of the water. This occurs where sediments

in the bed are mobilised and are suspended in the water, thereby reducing water clarity. Any reduction in water quality caused by bed disturbance can adversely affect the natural and human use values supported by the water body and other users of water.

Principal reasons for adopting

This objective is adopted to ensure that activities involving bed disturbance are managed to minimise reductions in water clarity. Such reductions are generally undesirable due to the potential to adversely affect the values and uses supported by the water body.

Policies: 8.6.1 to 8.6.3

8.3.3 To maintain the integrity of existing defences against water.

Explanation

Defences against water, such as stopbanks, have been used extensively throughout Otago to reduce the threat of flooding. These defences are an integral component of the community’s response to flood events. It is important that these works are able to continue to operate effectively.

Principal reasons for adopting

This objective is adopted to avoid or minimise the risk of flooding which adversely affects Otago’s people and communities. This risk may be increased where land use activities threaten the integrity or function of existing defences against water.

Policies: 8.5.5, 8.5.6

8.3.4 To remedy any adverse effect resulting from the failure or overtopping of any dam structure.

Explanation

Damage from dam failure or overtopping needs to be avoided but, in the event that it occurs, appropriate remedial actions will be required. Due to the risk involved, it is necessary to plan for the possible need to remedy any loss or damage caused.

Principal reasons for adopting

This objective is adopted to ensure that loss or damage that occurs as a result of dam failure or overtopping will be remedied.

Policies: 8.5.3

8.4 General policies

8.4.1 When managing activities in, on, under or over the bed or margin of any lake or river, to give priority to avoiding changes in the nature of flow and sediment processes in those water bodies, where those changes will cause adverse effects:

- (a) **On the stability and function of existing structures located in, on, under or over the bed or margin of any lake or river;**
- (b) **Arising from associated erosion or sedimentation of the bed or margin of any lake or river, or land instability; or**
- (c) **Arising from any reduction in the flood carrying capacity of any lake or river.**

Explanation

This policy recognises that activities in, on, under or over the bed or margins of a lake or river may obstruct or redirect the flow of water or sediment, thereby adversely affecting structures or exacerbating a natural hazard, such as flooding, erosion, land instability or sedimentation. The potential for such effects needs to be taken into account when preparing or reviewing plans under the Resource Management Act and when considering applications for resource consents for activities in, on, under or over the bed or margins of lakes and rivers. Where changes in flow and sediment processes are considered to be unavoidable, a resource consent may be declined or, if granted, may be subject to conditions requiring unavoidable adverse effects to be remedied or mitigated. In the case of diversion, reclamation or damming, appropriate compensation may be required as provided for by Policies 6.5.6 and 8.4.2.

Principal reasons for adopting

This policy is adopted to ensure that the natural and physical resources of the beds and margins of lakes and rivers are protected from the adverse effects of the modification of flow and sediment processes.

Rules: 13.1.2.1, 13.2.2.1, 13.2.3.1, 13.3.2.1, 13.4.2.1, 13.5.2.1, 13.5.3.1, 13.6.3.1

Other methods: 15.2.7.1, 15.2.8.1 to 15.2.8.3, 15.4.2.1

8.4.2 Financial contributions, or works or services may be required to offset, remedy or mitigate any unavoidable adverse effect of damming or reclamation on:

- (a) **Any natural or human use value identified in Schedule 1;**
- (b) **The natural character of the water body;**
- (c) **Any amenity value supported by the water body; or**
- (d) **Any heritage value associated with any affected water body.**

Explanation

The damming or reclamation of the bed or margins of Otago’s lakes and rivers can result in unavoidable adverse effects on the natural and human use values supported by the water body. Where such effects occur, financial contributions, or works or services, may be required as a condition of a resource consent to offset, remedy or mitigate the effects. The amount and type of financial contribution, or the type of work or service, will depend on the nature of the activity and will relate to the adverse effects on the natural and human use values. Financial contributions are detailed in Chapter 17 of this Plan. Recognition will be given to the extent to which resource use and development has modified the water body, and the positive effects of the proposed activity

will be taken into account, when assessing any requirement for financial contributions, or works or services.

Principal reasons for adopting

This policy is adopted to ensure provision is made to either offset, remedy or mitigate any unavoidable adverse effect of damming or reclamation activities on the beds and margins of lakes and rivers.

Rules: 12.3.3.1, 12.3.4.1, 13.2.3.1, 13.3.2.1, 13.5.3.1

See also: Chapter 17; Policies 6.5.6, 10.4.2A

8.5 Policies applying to structures

8.5.1 To require, where necessary, desirable and practicable, any structure in or on the bed of any lake or river to provide for fish migration through or past it, or alternative remedial measures where fish migration is not practicable.

Explanation

Where the Otago Regional Council requires a resource consent for a structure, it will consider requiring the person erecting or placing the structure to provide means for the upstream and downstream passage of fish. This requirement is only necessary where the structure is likely to restrict fish passage. There are situations where passage may not be necessary or desirable, for a variety of reasons, and these need to be assessed on a case-by-case basis. Although it will be sought in the first instance, it may not always be possible to provide an effective fish pass given the nature of the structure. In such circumstances, the Council may require remedial actions. Those structures erected under a permitted activity rule of this Plan will still have to comply with the requirements of the Freshwater Fisheries Regulations 1983 with respect to fish passage, administered by the Department of Conservation.

Principal reasons for adopting

This policy is adopted to provide for the unimpeded migration of fish, where necessary, desirable and practicable, or alternative remedial measures where fish migration is not practicable. Many of the region’s native fish species, for example eels, and introduced trout and salmon, migrate to or from the sea, or up and down water bodies. Because these fish species require different aquatic habitats at different life stages, unimpeded access is essential to the survival of local fish populations.

Rules: 13.2.2.1, 13.2.3.1

8.5.2 To prohibit the erection of a dam on the bed of lakes or rivers in parts of the following catchments in accordance with Schedule 6:

- (a) **Kawarau River;**
- (b) **Lake Wanaka and Upper Clutha River/Mata-Au;**
- (c) **Pomahaka River;**

- (d) **Waipahi River; and**
- (e) **Lower Clutha River/Mata-Au.**

Explanation

This policy provides for the prohibition of damming in the identified catchments. Schedule 6 provides further detail in respect of the water bodies within these catchments on which dams will be prohibited. Regarding the Pomahaka River and Waipahi River catchments, and the Lower Clutha River/Mata-Au, the prohibition on damming does not extend to damming for stockwater supply purposes.

Principal reasons for adopting

The Water Conservation (Kawarau) Order and the Lake Wanaka Preservation Act prohibit the damming of water. The Pomahaka River and Tributaries and Lower Clutha River/Mata-Au Local Water Conservation Notice, deleted by this Plan, also prohibited the damming of water. It is therefore appropriate, for consistency, to prohibit the damming of the same waters within this Plan.

Rules: 12.3.1.1 to 12.3.1.3

8.5.3 To require the holder of any resource consent for a dam on the bed of a lake or river to remedy any adverse effect attributable to the failure or overtopping of the dam structure, either during or after its construction.

Explanation

Where the Otago Regional Council requires a resource consent for:

- (a) The damming of water; or
- (b) The erection of a dam;

it will require the person erecting the dam to plan for and provide appropriate measures to remedy any loss or damage caused by the failure or overtopping of the dam at any stage.

These measures may include:

- (i) Bonds, as provided for by Section 108 of the Resource Management Act;
- (ii) Insurance; or
- (iii) Other appropriate means.

Remedial action will be required only where adverse effects of any failure or overtopping can be attributed to the dam, as opposed to those that may have occurred in the absence of the dam.

Required remediation may be assessed as appropriate having regard to the necessity and practicability of reinstating prior conditions, and alternative options that may compensate for losses suffered by the affected community.

Principal reasons for adopting

This policy is adopted to provide for the remediation of adverse effects arising from the failure or overtopping of a dam. The policy also provides an incentive for dam owners to undergo ongoing risk management.

Rules: 12.3.3.1, 12.3.4.1, 13.2.3.1, 13.3.2.1

8.5.4 To consider the removal of any abandoned structure in, on, under or over the bed of a lake or river which can be shown to significantly:

- (a) **Exacerbate the effects of flooding or erosion;**
- (b) **Impede or prevent fish passage, where such passage is desirable;**
- (c) **Threaten the health or safety of people or communities; or**
- (d) **Degrade amenity values.**

Explanation

The holder of the relevant resource consent authorising an abandoned structure, or its owner, may be required to remove the structure where it is shown to be:

- (i) Unable to withstand expected hazard events, such as floods or erosion;
- (ii) Capable of significantly worsening flood or erosion situations, including bank instability, either directly or because of lack of maintenance;
- (iii) Impeding or preventing fish passage where such passage is required, given the vulnerability of some isolated populations of native fish;
- (iv) Unstable, or significantly threatening public health and safety in some other way; or
- (v) Degrading scenic values associated with, or recreational opportunities provided by, the water body.

This removal will be required either through a condition of a resource consent, or through an enforcement order where there is no such condition or resource consent. Such removal will be subject to this Plan's provisions concerning discharges and bed and margin disturbance. The community may need to be consulted about abandoned structures prior to their removal.

Where such structures are of heritage value and are causing adverse effects associated with flooding, erosion, or threats to the health and safety of people and communities, their removal may not be necessary as long as those effects are adequately remedied or mitigated.

Principal reasons for adopting

This policy is adopted to avoid any of the adverse effects caused by abandoned structures within the bed of a lake or river through their removal. The removal of sites, buildings, places or areas of significant heritage value, such as historic wing dams and revetments may not be required, as they are significant cultural resources and are valued for their amenity.

Rules: 13.4.2.1

8.5.5 In considering the construction, reconstruction or modification of defences against water, to have regard to:

- (a) **The effectiveness of the proposed work;**
- (b) **The need for the defence; and**
- (c) **Any effect on existing defences.**

Explanation

Defences against water are important in Otago as they mitigate flood and erosion hazards. Prior to constructing any new defence, or reconstructing or modifying an existing defence, consideration must be given to whether hazard mitigation is actually required, and how the structure will perform in relation to existing defences against water.

Principal reasons for adopting

This policy is adopted to ensure that flood or erosion protection structures are constructed in a coordinated and integrated manner, and do not compromise any other flood or erosion response. This will result in the effective performance of such structures and a reduction in the potential adverse effects of any flood or erosion event.

Rules: 13.2.3.1, 13.3.2.1, 13.4.2.1, 13.6.3.1, 14.3.2.1, 14.4.2.1

Other methods: 15.2.7.1, 15.2.8.1, 15.2.8.2, 15.3.3.1, 15.3.3.2

8.5.6 To manage activities that have the potential to adversely affect existing defences against water.

Explanation

Defences against water are often located in or on the bed or margins of lakes and rivers to protect Otago's people and communities from the adverse effects of flooding. Activities undertaken on, or in close proximity to such works have the potential to adversely affect the manner in which they were designed to function.

Principal reasons for adopting

This policy is adopted to maintain the integrity of defences against water located in or on the bed or margins of lakes and rivers. If these works are able to operate as intended, the risk of flooding adversely affecting Otago's people and communities will be reduced.

Rules: 13.2.2.1, 13.2.3.1, 13.3.2.1, 13.4.2.1, 13.5.2.1, 13.5.3.1, 13.6.3.1, 13.7.2.1

Other methods: 15.2.7.1, 15.2.8.1, 15.2.8.2, 15.3.3.1, 15.3.3.2

8.6 Policies applying to bed or margin disturbance

8.6.1 In managing the disturbance of the bed or margin of any lake or river, to have regard to any adverse effect on:

- (a) **The spawning requirements of indigenous fauna, and trout or salmon;**

- (b) **Bed and bank stability;**
- (c) **Water quality;**
- (d) **Amenity values caused by any reduction in water clarity; and**
- (e) **Downstream users.**

Explanation

Bed disturbance can lead to a change in bedform, or a reduction in clarity downstream, and may consequently adversely affect fish spawning, bed and bank stability, water quality, amenity values and downstream users. When considering activities that would result in bed disturbance, it is important to have regard to the potential for these adverse effects. Policy 5.4.2 manages any adverse effects on natural and human use values.

Principal reasons for adopting

This policy is adopted to provide recognition that there are natural and human use values and other uses of water that are particularly susceptible to the physical changes caused by disturbance of the bed. Such values and uses will be maintained where the adverse effects of bed disturbance are avoided, remedied or mitigated.

Rules: 13.5.2.1, 13.5.3.1, 13.6.3.1, 13.7.2.1

Other methods: 15.2.7.1, 15.2.8.1 to 15.2.8.3, 15.4.2.1, 15.4.2.2, 15.5.1.1

See also: Chapter 7

8.6.2 To promote best management practices for activities that occur within or adjacent to the bed of lakes and rivers in order to avoid, remedy or mitigate any adverse effect.

Explanation

A variety of land use activities can occur within or adjacent to the beds of lakes and rivers including grazing, cultivation, forestry, river works and pest control. Due to their proximity to such water bodies, these activities have the potential to adversely affect the natural and human use values supported by them. The Otago Regional Council has prepared best management practices, in conjunction with Federated Farmers, the forestry industry, government departments and the Otago Fish and Game Council, for the above activities. Some of these are included in the Council’s “Riparian Management” document. The Otago Regional Council will encourage the adoption of these and other best management practices that avoid, remedy or mitigate any adverse effects on the environment.

Principal reasons for adopting

This policy is adopted to encourage the voluntary use of best management practices by those undertaking activities within the bed or margins of lakes and rivers. The best management practices bring together the best information available on how to minimise the impact of such activities on water resources.

Other methods: 15.2.7.1, 15.2.8.1 to 15.2.8.3, 15.4.2.1, 15.4.2.2, 15.5.1.1

See also: Chapter 7

8.6.3 To provide for small suction dredge mining operations in rivers without the need for a resource consent, except in those water bodies identified in Schedule 7.

Explanation

Suction dredge mining involves the disturbance of sand and gravel in the wet bed of rivers and can cause significant adverse effects. Suction dredging operations that comply with Rule 13.5.1.7 will not give rise to any significant bed disturbance. However, some Otago rivers, identified in Schedule 7 of this Plan, have a unique value for fish spawning and rearing, are important for water supply purposes or are particularly sensitive to bed damage.

Principal reasons for adopting

This policy is adopted to avoid unnecessary constraint on suction dredging operations that involve minimal bed disturbance, while recognising that tighter restriction should apply where water bodies are particularly sensitive to such disturbance.

Rules: 13.5.1.7

8.6.4 To ensure that any extraction of bed material from the bed of any lake or river is within the sustainable yield of the lake or river system.

Explanation

Bed material, particularly sand and gravel, is an important resource of Otago's lakes and rivers. Over-extraction of such material can result in changes in river morphology and lead to adverse effects. Over-extraction occurs where the total quantity of bed material removed exceeds the quantity naturally replenished. Therefore, when considering the extraction of bed material, regard will be had to the location of the extraction and the cumulative volume of material removed from a particular water body, to ensure that extraction is at a sustainable level.

Principal reasons for adopting

This policy is adopted to ensure that the extraction of bed material from a lake or river is sustainable. This will ensure that long term effects caused by over-extraction, such as lowering the level of the bed and bank erosion, are avoided.

Rules: 13.5.1.6, 13.5.2.1, 13.5.3.1

Other methods: 15.2.8.3

8.6.5 With respect to the Kakanui-Kauru Alluvium and Shag Alluvium groundwater aquifers, to require that any extraction of material from the bed of a lake or river does not adversely affect the aquifer.

Explanation

When considering the extraction of bed material from the Kakanui and Shag Rivers, or other surface water bodies in close proximity to the Kakanui-Kauru Alluvium and Shag Alluvium Aquifers, regard must be had to the effect of that

extraction on the groundwater resource. The Kakanui-Kauru Alluvium and Shag Alluvium Aquifers are identified on Maps C17, C18 and C19.

Principal reasons for adopting

This policy is adopted to maintain the volume and yield of groundwater from the Kakanui-Kauru Alluvium and Shag Alluvium Aquifers. Extraction of bed material from surface water bodies can lower the watertable of these aquifers due to the close hydrological connection between the surface water and groundwater. This will adversely affect groundwater users.

Rules: 13.5.1.6, 13.5.2.1, 13.5.3.1

See also: Chapter 9

8.7 Policies applying to vegetation

8.7.1 To promote the creation, retention and enhancement of appropriate riparian vegetation where it will:

- (a) **Maintain or enhance water quality, through the interception of non-point source contamination from adjacent land;**
- (b) **Enhance the aquatic ecosystems within a water body, and the habitat for flora and fauna on the margins;**
- (c) **Maintain or enhance the natural character of lakes and rivers and their margins;**
- (d) **Maintain or enhance amenity values;**
- (e) **Avoid, remedy or mitigate the adverse effects arising from flooding or erosion;**
- (f) **Be unlikely to have a significant adverse effect on desirable species already present, or adjacent to, and downstream from, that riparian vegetation;**
- (g) **Be unlikely to restrict existing public access along the beds and margins of Otago’s lakes and rivers;**
- (h) **Be unlikely to have a significant adverse effect on the heritage value of any site, building, place or area;**
- (i) **Be unlikely to impose any significant operational constraints on existing network utilities; or**
- (j) **Enhance mahika kai values.**

Explanation

Appropriate riparian vegetation includes:

- (a) Any plant indigenous to the region;
- (b) Any introduced non-invasive plant, planted for flood or erosion control;
- (c) Any traditional mahika kai plant used by Kai Tahu for any purpose; and
- (d) Any introduced non-invasive plant, that contributes to the natural character of the lake or river.

This vegetation does not include plants identified in the Pest Management Strategy for Otago 2009, or crack or grey willow which are likely to increase the risk of flooding through impeding flood waters.

This policy will be implemented through district planning mechanisms and through this Plan promoting riparian land occupiers and others to assess opportunities for the creation, retention and enhancement of riparian vegetation. To this end, the Otago Regional Council has released guidelines, in the document “Riparian Management”, which provide information on planning a revegetation programme, fencing and site preparation, species selection and planting methods.

Principal reasons for adopting

This policy is adopted to encourage Otago’s people and communities to retain and plant riparian vegetation where it will achieve the specified outcomes. Appropriate riparian vegetation acts as a buffer between a lake or a river and the adjacent land uses by reducing the amount of nutrients and other contaminants entering the water, through filtration, and plant and microbial uptake. It also contributes to habitat values as an integral component of the natural character of many Otago lakes and rivers, and can assist bank stability and the mitigation of flooding or erosion hazards.

Other methods: 15.2.8.1 to 15.2.8.3, 15.6.1.1

See also: Chapter 7

8.7.2 To prohibit the introduction of any plant included in any pest management strategy in force in Otago, to any part of the bed or water of any Otago lake or river.

Explanation

The following aquatic plants are undesirable in or on the beds, or in the water of Otago’s lakes and rivers and are identified as requiring management in the Pest Management Strategy for Otago 2009:

- (a) Lagarosiphon *Lagarosiphon major*
- (b) Eel Grass *Vallisneria spiralis*
- (c) Egeria *Egeria densa*
- (d) Hornwort *Ceratophyllum demersum*
- (e) Hydrilla *Hydrilla verticillata*
- (f) Sagittaria *Sagittaria graminea ssp platyphylla*
- (g) Spartina *Spartina anglica*
- (h) Salvinia *Salvinia molesta*
- (i) Water Hyacinth *Eichhornia crassipes*
- (j) Water Lettuce *Pistia stratiotes*

This Plan prohibits the introduction of any of the identified species to the bed or water of any lake or river.

Principal reasons for adopting

This policy is adopted to provide for the management of aquatic pest plants consistent with the Pest Management Strategy for Otago 2009. This will assist in protecting the natural character of water bodies where the identified aquatic pest plants are not already present.

Rules: 13.6.1.1

8.8 Policies applying to reclamation and deposition

8.8.1 To consider practical alternatives to:

- (a) **The reclamation of the bed of any lake or river; and**
- (b) **The deposition of any substance in, on or under, the bed or margin of any lake or river.**

Explanation

When considering the reclamation of the bed, or activities that would result in deposition, it is important to have regard to alternatives, including use of other land or deposition away from the bed or margin of the lake or river.

Principal reasons for adopting

This policy is adopted to ensure that reclamation or the deposition of substances in or on the beds or margins of lakes and rivers only takes place where it is necessary. This approach recognises that reclamation or deposition should be discouraged wherever possible, as these activities can have significant adverse effects on the natural and human use values of lakes and rivers, or create or exacerbate hazards.

Rules: 13.5.3.1

Other methods: 15.2.8.1 to 15.2.8.3, 15.4.2.1, 15.4.2.2

8.8.2 To require only cleanfill be used to create any reclamation of the bed of a lake or river.

Explanation

The Otago Regional Council will only allow cleanfill to be used to create a reclamation of the bed of a lake or river. Cleanfill includes natural and other materials which are not subject to biological or chemical breakdown. Even where cleanfill is used, the reclamation may still result in temporary discharges to water. These discharges will be subject to the provisions of this Plan.

Principal reasons for adopting

This policy is adopted to reduce the discharge of contaminants from material used to create reclamations. This is best achieved by requiring that material be cleanfill, as this reduces the contaminants which are likely to, or have the potential to, adversely affect water quality in Otago's lakes and rivers.

Rules: 13.5.3.1

See also: Chapter 7

8.9 Anticipated environmental results

- 8.9.1 Activities which alter the existing nature of natural physical processes do not exacerbate natural hazards or threaten the integrity of structures.**
- 8.9.2 Physical changes to bedform of lakes and rivers and water clarity caused by bed disturbance are minimised.**
- 8.9.3 Existing fish passage in lakes and rivers is not inhibited by structures.**
- 8.9.4 Otago’s people and communities are protected from the adverse effects of flooding.**
- 8.9.5 The water quality of lakes and rivers is not adversely affected by the disturbance and reclamation of the bed.**
- 8.9.6 Gravel extraction occurs within the sustainable yield.**
- 8.9.7 Existing areas of riparian vegetation are retained or enhanced, and areas of new riparian vegetation are created, where they provide an environmental benefit.**
- 8.9.8 The habitat of threatened indigenous aquatic fauna and flora is protected.**
- 8.9.9 Hazard mitigation works, depositions, or reclamations associated with the beds of lakes or rivers occur only where they are necessary.**
- 8.9.10 The unavoidable adverse effects of inundation resulting from the damming of water are remedied.**
- 8.9.11 Any damage caused by failure or overtopping of a dam structure is remedied.**
- 8.9.12 Damming of water does not occur in the following catchments except as provided for by legislation or Rule 12.3.1.3 of this Plan:**
 - (a) Kawarau River;**
 - (b) Lake Wanaka and the Upper Clutha River/Mata-Au;**
 - (c) Pomahaka River;**
 - (d) Waipahi River; and**
 - (e) Lower Clutha River/Mata-Au.**
- 8.9.13 Waahi taonga and waahi tapu sites are not adversely affected by activities on the beds or margins of lakes or rivers.**

Monitoring of the achievement of these anticipated environmental results will be carried out as outlined in Chapter 19.

T H E B E D S A N D M A R G I N S O F L A K E S A N D R I V E R S