

### 6.2.3 Comparison with current management

Appendix 6 identifies how the rivers in the Otaki, Mangatarere, Pahoa, and Mangaone catchments are managed according to river specific provisions of the Regional Freshwater Plan for the Wellington Region. A comparison of the trial with current management is limited by the trial's application to only four catchments in the Region. Nevertheless, some general comments are made, below, that are expected to apply across the Region.

All rivers in the Wellington Region are managed for aquatic ecosystem purposes in the Regional Freshwater Plan. Ecological criteria and water quality guidelines are provided in the Plan but these must be considered on a case by case basis when applications are made for resource consents. The ability to divide rivers managed for aquatic ecosystems into sub categories using habitat classes is attractive because it would provide more definition about how all rivers in the Region are to be managed. However, as mentioned above in section 6.2.2, until the biological significance of each habitat class is assessed, the ability to provide more certainty in regional plans about the management of rivers for a variety of different aquatic ecosystem purposes will be limited.

There is a reasonably good association between rivers to be managed for natural state purposes in the Regional Freshwater Plan and for rivers within the habitat class for indigenous vegetation. The Otaki River has already been mentioned in section 6.2.2. The same connection of indigenous vegetation and natural state purposes occurs in the headwaters of the Mangatarere catchment, which is in the Tararua Forest Park.

There appears to be a reasonably good association between rivers to be managed for trout fishery and trout spawning purposes in the Regional Freshwater Plan and for rivers flowing within hard sedimentary rock. This is demonstrated in the Mangatarere catchment that has some tributaries in hard sedimentary rock and others in soft sedimentary rock. However, there appears to be little correlation of other variables with rivers that are known to be good trout fisheries. Some rivers flowing in hard sedimentary rock are not considered to be good trout fisheries.

There is little association between rivers managed for indigenous fish species in the Regional Freshwater Plan and the habitat classes that occur within these rivers. The lack of any connection in this instance is probably because of the catchment-wide approach taken for managing indigenous fish in the Plan. A catchment-wide approach was taken because of the importance of migration throughout the entire catchment for the species being managed. In other words, the approach in the Plan focuses on the migration of fish rather than the more specific habitat requirements for adult habitat or spawning.

## 7 How well does River Habitat Classification Perform?

Table 1 summarises the performance of river habitat classification in this study. In Table 1, performance is measured against the “promise” of river habitat classification identified in section 3.2 of this report. Under the heading “Performance”, a tick and a question mark indicate that river habitat classification performs well in some respects but there are questions about how it might work in practice that still need to be answered. These aspects of its performance are discussed under the heading “Comment” in Table 1. Two ticks indicate that river habitat classification performs well in all respects. Two question marks indicate this aspect of river habitat classification was not examined here. Crosses would indicate that it performs badly with little scope for improvement, but none were needed.

Table 1 identifies that the following improvements to river habitat classification are needed before it could become an integral part of the development and implementation of regional plans:

- a detailed explanation of the biological differences between habitat classes; and/or
- fewer habitat classes.

These two areas for improvement are inter-related. They will have the effect of reducing the number of habitat classes and providing better links between habitat classes and the biological differences between rivers.

The limitations of river habitat classification, identified in section 3.3 of this report were also looked at in the context of its performance. “Cost” is not related to performance. As discussed in section 3.3.1, for the Wellington Regional Council (which is all that can be commented on here), costs would be low. “Complexity” and limitations in “The scope of river habitat classification” are addressed in section 3.3. They need not affect its performance. The only matter from section 3.3 that affects performance is “River habitat classification is still being developed”. This is not a limitation on performance but highlights that the steps forward suggested here can be made while the methodology is being developed.

Section 3.4 of this report discusses some alternatives to river habitat classification that are currently used to identify the similarities and differences between rivers in a region. It is unlikely that habitat classification would, or should, replace these alternatives. Instead, river habitat classification provides an additional tool. The performance of habitat classification in the trial described in Section 6 of this report suggests that it has the following advantage over current approaches. River habitat classification can improve the management of similar and different rivers, compared to present approaches, because:

**Table 1:** The Performance of River Habitat Classification

<b>Promise</b> (as identified in section 3.2)	<b>Performance</b>	<b>Comment</b>
Information is organised for easy interpretation	✓ ?	The maps in the report organise a large amount of information on single A4 pages. For individual variables in Appendices 6 and 7, the information is easy to interpret but for Maps 3, 4 and 5, showing all habitat classes for “subcatchment” scale variables in the Mangaone, Mangatarere and Pahoa catchments, the number of habitat classes mean interpretation is not easy. If “valley segment” scale variables were introduced to these maps, they would be unworkable unless the number of habitat classes can be reduced.
Similarities and differences between rivers are identified	✓ ?	Maps 2 to 5 clearly identify the similarities and differences between rivers, and parts of rivers, according to the variables used for habitat classification. The significance of these differences for the management of some rivers can be identified. However, the implications for the management of many rivers is not clear because biological and ecological differences between habitat classes have not been explained.
The methodology is flexible	✓ ✓	The ability of the process for river habitat classification to add new data or variables and to respond to field information was demonstrated during the preparation of Maps 1 to 5 and the maps in Appendices 6 and 7.
Common information is provided for regional plans, resource consents, and state of the environment reporting	✓ ?	This aspect of habitat classification was not examined here. Feedback from colleagues at the Wellington Regional Council during the preparation of this report indicates that river habitat classification would be a useful database for resource consents and state of the environment reporting.
An “effects based” approach	? ?	This aspect of habitat classification was not examined here.
The biology and ecology of rivers can be predicted	✓ ?	The ability to predict the biology and ecology of some habitat classes can be demonstrated in some instances but has yet to be established for most habitat classes.
Information sharing between councils is enhanced	? ?	This aspect of habitat classification was not examined here.

- information on the key physical variables of rivers is combined into one “layer”;
- greater detail is available for the accurate identification of management boundaries; and
- the approach is systematic because it requires the management of all rivers in a region to be addressed in the context of their habitat classes.

## **8 Using River Habitat Classification in Regional Plans**

At the outset of this project it was hoped that the trial described in section 6 of this report would be able to link habitat classes with purposes for managing rivers. In particular, it was contemplated that mock plan provisions could be developed using the information that river habitat classification provides. However, the lack of information on the biological differences between habitat classes, or their significance, means that connections cannot be made at present between habitat classes and management purposes for the rivers identified in Maps 2 to 5. Instead, in this report it is worthwhile to look generally at the ways river habitat classification might be used in regional plans.

### **8.1 Adding Value**

Section 7 of this report identifies some areas where river habitat classification already performs well and where it can improve. Section 7 also identifies where it has advantages over currently used alternative approaches. River habitat classification can be regarded as a tool which, together with the other available tools mentioned in section 3.4, improves the ability of regional councils to identify and manage the similarities and differences between rivers.

The ability of river habitat classification to add value to decision making applies to the information it can provide about rivers being managed for all human use and natural value purposes. Using river habitat classification in this way means that it would probably not be an integral part of the provisions of regional plans but it would be used as a source of information during their preparation. This use of river habitat classification is consistent with its present stage of development.

As well, regional plans could specify that regard must be had to river habitat classes when resource consent applications are considered. The information provided by habitat classification describes key physical characteristics of rivers. Section 5.3 of this report identifies that these characteristics can be likened to the essential characteristics of ecosystems that contribute to their intrinsic values. Section 7(d) of the Act requires particular regard to be had to the intrinsic values of ecosystems during the preparation of regional plans and for resource consent applications.

## 8.2 Contributing to Managing Rivers for “Purposes”

Another approach for plans is to use the biological information provided by river habitat classification to help establish purposes for managing rivers that relate to their biological significance. Provisions in a plan would then need to provide for the management of these specified rivers, or parts of rivers, according to the purposes identified. Such provisions would need to draw from the physical and biological information provided by river habitat classification and on any other information relevant to the habitat classes and purposes identified. The plan provisions would probably include information provided directly by river habitat classification. This approach would make river habitat classification an integral part of a regional plan.

Some examples of ecosystem based river management purposes for rivers, or parts of rivers, might be:

- trout fishery;
- salmon fishery;
- whitebait fishery;
- the habitat of threatened indigenous fish species;
- the habitat of fish species which are taonga;
- the habitat of nesting birds (braided river birds);
- free of exotic plants.

The approach suggested here of establishing ecosystem based management purposes and plan provisions for particular rivers, or parts of rivers, using river habitat classification is not consistent with its present stage of development. Before it can be achieved, more information is needed on the biological differences between habitat classes and their significance, as identified in sections 6.2.2 and 7 of this report.

## References

Rutherford JC, Cooper AB, and Quinn JM, 1996. Towards a framework for Ecotyping: A Discussion Document. Prepared for Ministry for the Environment.

Rutherford JC, Snelder T, and Pyle E, 1997. A draft spacial framework for aquatic ecosystem management. Prepared for Ministry for the Environment: Consultancy Report MFE70201/2.

Snelder T, Biggs B, Shankar U, McDowall B, Stephens T, and Boothroyd I, 1998. Development of a System of Physically Based Habitat Classification for Water Resources Management of New Zealand Rivers. Prepared for Canterbury Regional Council, Tasman District Council, Southland Regional Council, Environment Waikato, and Taranaki Regional Council: NIWA Client Report: CHC98/68.

Snelder T and Clarke C, 1999. Management framework for ecological values of rivers 1999. Prepared for Ministry for the Environment: NIWA Client Report: CHC98/70.

# Appendix 1: Categories Used for Mapping Physical Variables

## Source of Flow

For each section of river within a catchment use:

1. Average catchment elevation (ACE) (m above sea level)
2. Average catchment slope (%)
3. Percentage of catchment above 1500 m (P1500).

To categorise source of flow using rules.

**If** P1500 > 25% **then** Source of Flow Class = Mountain

**If** P1500 < 25% and {ACE > 100 or Slope > 10% } **then** Source of Flow Class = Hill

**If** ACE < 100m and Slope < 10% **then** Source of Flow Class = Lowland

## Geology

For each node use upstream catchment to select areas of each top rock and base rock field from NZLRI.

Group areas of rock fields for Top and Base rock into Geological Groups as shown in Table 2 below.

**Table 2:** Geological Groups

Geological Group	NZLRI fields (South Island)	NZLRI field (North Island)
Loess	Lo	Lo
Alluvium and Sand	Pt	Al, Gr, Wb
Peat	Al, Wb	Pt
Soft Sedimentary	Ms, Ss, Fy, Cw, Hs	Mm, Mb, Mj, Me, Sm, Sb, Cg, Us
Hard Sedimentary	Gw, Ar	Ar, Ac, Gr
Lime Stone	Ls, Ma	Li
Miscellaneous	Othertop, Otherbase	Othertop/Otherbase
Basic Igneous	Um	Um, Sc, La, Ng, Ta, Rm
Acidic Igneous		Kt, Lp, Tp, Ft
Mix Igneous	Tb, Vo, In,	Vo, Vu, Mo
Schist	St1, St2	
Gneiss	Gs	
Plutonic	Gn	

Calculate percentage of total catchment area for each Geological Group. Apply following rule to derive geology class for each node:

**Geology class**

Predominant Geological Group by area.  
 {If two groups are predominant (ie they both have the same % of catchment area and this is greater than all other groups) then geology class should be assigned on the basis of the order shown below:

1. Soft Sedimentary
2. Lime Stone
3. The rest in alphabetical order}

**Unless**

Lime Stone > 25% of catchment area **then** Lime stone

**Unless**

Soft Sedimentary > 25% of catchment area **then** Soft Sedimentary

**Landcover**

For each node use upstream catchment to, select areas of each LCDB field from LCDB. Group areas of land cover fields into Land Cover Groups as shown in Table 3 below.

**Table 3:** Land Cover Groups

Land Cover Group	LCDB field
Pasture	PRIM-HORT, PRIM PASTORAL
Tussock	TUSSOCK
Scrub	SCRUB, SEMI
Exotic forestry	PLANTED FOREST
Wetlands	COASTAL WETLANDS, INLAND WETLANDS
Urban	URBAN, URBAN-OPEN SPACE, MINES + PUMPS
Indigenous forest	INDIGENOUS FOREST
Misc	BARE GROUND, COASTAL SANDS

Calculate percentage of total catchment area for each Land Cover Group. Apply following rule to derive Land Cover Class for each node:

## Land Cover class

{Predominant Land Cover Group by area. If two groups are predominant (ie they both have the same % of catchment area and this is greater than all other groups) then Land Cover class should be assigned on the basis of the order shown below:

1. Urban
2. Pasture
3. The rest in alphabetical order}

**Unless**

Pasture > 25% of catchment area **then** Land Cover Class = Pasture

**Unless**

Urban > 15% of catchment area **then** Land Cover Class = Urban

## Morphology

Calculate slope of valley segment in %. Assign Morphological Class as shown on Table 4.

**Table 4:** Morphological Class

Class	Slope
Steep	>4%
Alluvial flood plain	4 – 1%
Entrenched	LT 1%

## Size

Derive an estimate of Specific Median Flow (ie. median flow per unit catchment area) for catchment from hydrological record (see your hydrologist). Calculate median flow at node by multiplying Specific Median Flow by catchment area at the node.

Class	Proposed new classes
A	0 – 20 l/s
B	20 – 100 l/s
C	100 – 500 l/s
D	500 l/s – 1 m <sup>3</sup> /s
E	1 m <sup>3</sup> /s – 5 m <sup>3</sup> /s
F	5 – 30 m <sup>3</sup> /s
G	30+ m <sup>3</sup> /s

# Elevation

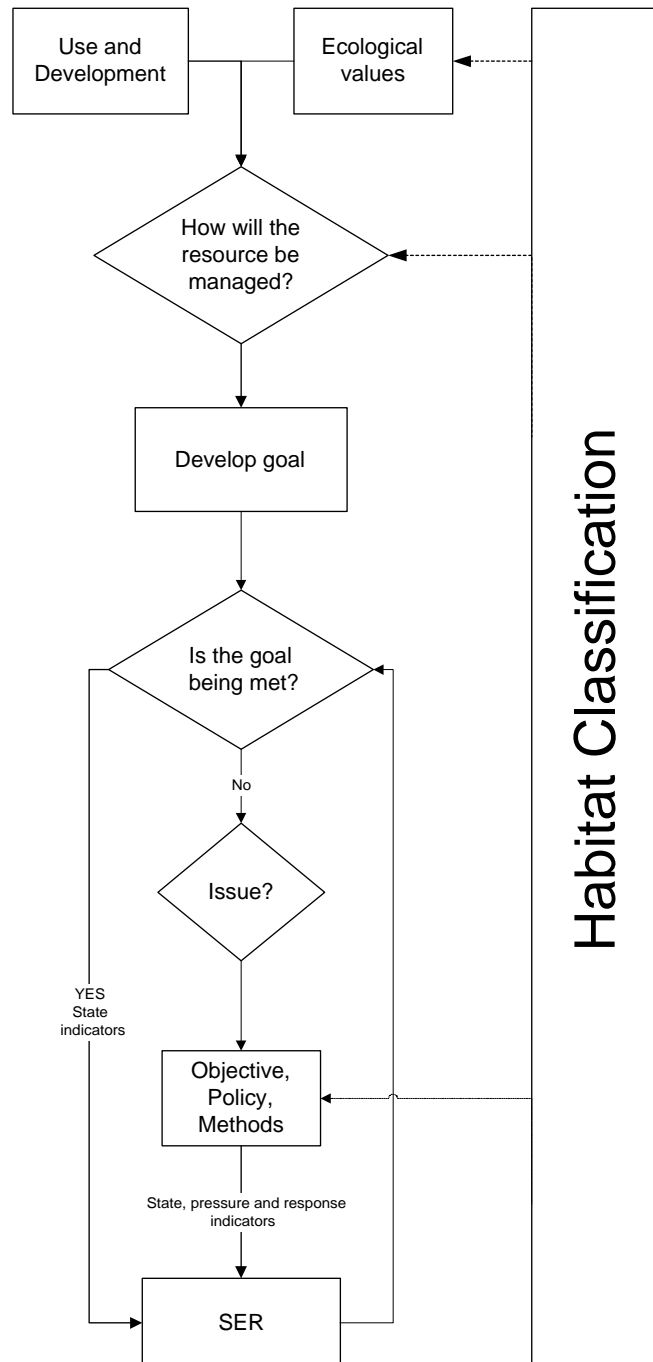
Calculate average elevation of valley segment in meters above sea level. Assign Elevation Class as shown on Table 5.

**Table 5:** Elevation Class

<b>Classes</b>	<b>Average Valley Segment Elevation</b>
A	0 – 20 m
B	20 – 100 m
C	100 – 1000m
D	1000+ m

## Appendix 2: A Planning Process for Managing Effects on Ecological Values of Rivers

(from Snelder *et al.* 1999)



## Appendix 3: A Description of Some Key Provisions in Regional Plans

### Issues, Objectives, Policies, and Methods

Some key provisions of plans are as follows:<sup>3</sup>

#### Issues should:

- relate to a matter which needs to be addressed to achieve the purpose of the Act;
- pertain to a resource, or environmental problem;
- be distinct from the principal reasons for adopting objectives, policies, and methods; and
- usually include the cause of the problem.

#### Objectives should:

- relate directly to a specified issue;
- state what the council wishes to see from the resolution of the issue;
- expound the state of the resource or the environmental value which is sought; and
- be “of” the plan not “for” the plan.

#### Policies should:

- relate directly to a stated objective;
- be capable of guiding resource consent decision making;
- be capable of leading to an effects based decision;
- state how the effect is going to be dealt with; and
- be “for” the region not merely “of” council.

#### Methods should:

- contain the specific actions, techniques, programmes and procedures to be adopted by the plan;
- be capable of giving effect to the policy; and
- contain the specific actions of the council as an agency with specific responsibilities where these actions are relevant.

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<sup>3</sup> From Ministry for the Environment, 1994. Issues, Objectives, Policies, Methods and Results Under the Resource Management Act. *Working Paper 1*.

## Categories of Rules

Rules are the methods of a plan which identify whether resource consents are required for activities. The Act includes the following categories of rules:

**Permitted activities** do not require resource consents. Activities can be carried out without resource consents provided they comply with all conditions specified in the rules.

**Controlled activities** require resource consents. Plans set out the information required with applications. The Council must grant applications for controlled activities if they comply with standards and terms specified in the rules. The assessment of environmental effects with applications for controlled activities is only required to address those matters specified in rules over which the Council has retained control. Conditions can be imposed on consents only in relation to the terms and conditions specified in rules.

**Discretionary activities** require resource consents. The Plan sets out the information required with applications. The Council has the discretion to grant consents and impose conditions, or decline applications. Rules may limit the scope of the Council discretion to specified matters. In this case the activities are described in the Plan as “restricted discretionary activities”.

**Non-complying activities** require resource consent. The Plan sets out the information required with applications. This category includes activities which rules specify as non-complying as well activities that contravene a rule in a plan. These activities are not prohibited. When making a decision on resource consent applications for a non-complying activities, the Council may only grant consents if it is satisfied that –

- “(i) The adverse effects on the environment will be minor; or*
- (ii) Granting the consent will not be contrary to the objectives and policies of the plan or proposed plan” (Section 105 (2)(b)).”*

Usually activities described as non-complying will have more than minor adverse effects. Where that is the case permits can only be granted if sub-paragraph (ii) is satisfied.

**Prohibited activities** cannot be undertaken in any circumstances. Any person who wants to do something described in a rule as a prohibited activity must apply to the Council for a Plan Change.

## Appendix 4: Plan Provisions that Identify Specific Water Bodies

Regional Council <sup>2</sup>	Provisions that Identify Specific Water Bodies as a Proportion of the Total Number of Plan Provisions (percentages in brackets) <sup>1</sup>				
	Objectives	Policies	Rules	Other Methods	Total
Hawkes Bay <sup>3</sup>	0/21 (0%)	5/61 (8%)	3/36 (8%)	0/35 (0%)	8/153 (5%)
Northland <sup>4</sup>	0/14 (0%)	1/78 (1%)	14/110 (13%)	8/131 (6%)	23/333 (7%)
Wellington <sup>5</sup>	0/28 (0%)	24/84 (29%)	31/47 (62%)	9/46 (20%)	64/205 (31%)
Taranaki <sup>6</sup>	1/19 (5%)	10/63 (18%)	21/76 (28%)	1/79 (1%)	33/237 (14%)
Otago <sup>7</sup>	2/23 (8%)	34/102(33%)	40/92 (37%)	0/25 (0%)	76/242 (31%)
Waikato <sup>8</sup>	0/11 (0%)	5/26 (19%)	34/83 (41%)	3/48 (10%)	42/168 (25%)

### <sup>1</sup> Criteria for Provisions that Identify Specific Water Bodies

Water bodies include rivers, lakes, wetlands, and groundwater, as identified in the Act.

The identification of specific water bodies in a plan provision refers to their specific mention in:

- an objective, policy, rule, or other method but not including explanations of provisions or reasons for them;
- an appendix specifically referred to in the objective, policy, rule, or other method;
- the conditions or standards in a rule; or
- the matters over which control or discretion is retained in a rule.

References to specific water bodies in other plan provisions are not considered, such as issues, explanations to provisions, principle reasons for provisions, and information to be provided when making consent applications.

References to specific water bodies in plan provisions are only counted once when they are mentioned in both a specific provision and the related "default" provision.

<sup>2</sup> The regional plans looked at are either operative plans or notified proposed plans, as identified below.

<sup>3</sup> Operative Regional Water Resources Plan – Hawkes Bay Regional Council.

<sup>4</sup> Proposed Regional Water and Soil Plan for Northland (notified April 1995) and the Variation (notified August 1997) – Northland Regional Council.

<sup>5</sup> Operative Regional Freshwater Plan for the Wellington Region.

<sup>6</sup> Proposed Regional Plan: Water for Otago (notified February 1998) – Otago Regional Council.

<sup>7</sup> Proposed Regional Freshwater Plan for Taranaki (notified February 1998) – Taranaki Regional Council.

<sup>8</sup> Proposed Waikato Regional Plan (notified September 1998) – Waikato Regional Council.

## Appendix 5: The Use of Management “Purposes” in Some Current Regional Plans

Plan <sup>1</sup>	Provision	Management Purposes	Comments
Hawkes Bay <sup>2</sup>	Policies	<p>All water bodies in the Region are to be managed for the purpose of maintaining aquatic ecosystems.</p> <p>Appropriate water bodies are to be identified (within 3 years of the Plan becoming operative) for management for contact recreation purposes.</p> <p>Groundwater quality in the Heretaunga Plains is to be managed for water supply purposes.</p>	Policies relate specifically to water quality.
Northland <sup>3</sup>	Objective	<p>Lakes, rivers and streams are managed for aquatic ecosystems, contact recreation, water supply, aesthetic and cultural purposes.</p> <p>Freshwater wetlands are managed for aquatic ecosystems, cultural purposes.</p> <p>Potentially useable groundwater is managed for water supply, protection of uses of receiving water bodies. Other groundwater is managed for protection of uses of receiving water bodies.</p>	Management purposes are identified in an objective without reference to specific water bodies. Various policies and methods include references to specific water bodies but not to the purposes they are to be managed for.
Wellington <sup>4</sup>	Policies, rules, other methods	<p>All water bodies in the Region are to be managed for aquatic ecosystem purposes.</p> <p>Specific rivers are identified for management for the following purposes: natural character; threatened indigenous fish; trout fishery and trout spawning; contact recreation; water supply; and water quality enhancement.</p>	<p>Management purposes are identified in policies for specific water bodies. Criteria and guidelines for management are linked to specific purposes.</p> <p>Rules provide different consent categories associated with different management purposes.</p> <p>Other methods identify non-regulatory action associated with management purposes.</p>

<b>Plan<sup>1</sup></b>	<b>Provision</b>	<b>Management Purposes</b>	<b>Comments</b>
Taranaki <sup>5</sup>	Objectives, policies, rules	Water of the Hangatahua River is to be maintained in its natural state.  Specific wetlands and rivers are identified with guidance for management of their natural, ecological and amenity values.	There are specific objectives, policies, and rules for the Hangatahua River.  The high natural, ecological and amenity values are set out in policies for each of the other rivers identified. The values are set out in policies for each regionally significant wetland.  Rules provide different consent categories for the Hangatahua River and for “protected” wetlands over other water bodies.
Otago <sup>6</sup>	Objectives, policies, rules	Natural and human use values are managed according to the details on values provided for each river identified. Natural and human use values include: ecosystem values, outstanding natural feature or landscape, significant indigenous vegetation and significant habitat of indigenous fauna, areas of little or no development, water supply, registered historic places, mana interests, access/customary use interests, and wetland values.	There are specific objectives, policies and rules for the management of natural and human use values. Rules provide different consent categories associated with different natural and human use values.
Waikato <sup>7</sup>	Policies, rules, other methods	Water classes are identified that manage rivers for: contact recreation, fisheries (trout fisheries and trout spawning, indigenous fisheries and fish habitat), natural state, and Waikato surface water.	Policies and rules provide management guidance and direction for water classes. Other methods provide water quality “standards” relating to each water class. Rules provide different consent categories associated with different water classes.

<sup>1</sup> The regional plans looked at are either operative plans or notified proposed plans, as identified below.

<sup>2</sup> Operative Regional Water Resources Plan – Hawkes Bay Regional Council.

<sup>3</sup> Proposed Regional Water and Soil Plan for Northland (notified April 1995) and the Variation (notified August 1997) – Northland Regional Council.

<sup>4</sup> Regional Freshwater Plan for the Wellington Region – Wellington Regional Council.

<sup>5</sup> Proposed Regional Freshwater Plan for Taranaki (notified February 1998) – Taranaki Regional Council.

<sup>6</sup> Proposed Regional Plan: Water for Otago (notified February 1998) – Otago Regional Council. <sup>7</sup> Proposed Waikato Regional Plan (notified September 1998) – Waikato Regional Council.

## Appendix 6: Current Management of Rivers in the Otaki, Mangatarere, Pahoa, and Mangaone Catchments

- 1 All rivers in the Wellington Region are managed for **aquatic ecosystem purposes**.
- 2 The **Otaki River**, shown in **Map 2**, is currently managed in the Proposed Regional Freshwater Plan by specific provisions for:
  - **natural state purposes** above “the forks”;
  - **indigenous fish**, over the entire catchment;
  - **trout fishery and trout spawning purposes**, above State Highway 1; and
  - **contact recreation purposes**, over the entire length of the river.
- 3 The **Mangatarere River**, shown in **Map 3**, is currently managed in the Regional Freshwater Plan by specific provisions for:
  - **natural state purposes** in the Tararua Forest Park; and
  - **trout fishery and trout spawning purposes**, in the main stem and in two major tributaries, the Kaipatangata Stream and Beef Creek.
- 4 The **Pahoa River**, shown in **Map 4**, is currently managed by no river specific provisions in the Regional Freshwater Plan.
- 5 The **Mangaone Stream**, shown in **Map 5**, is currently managed in the Regional Freshwater Plan by specific provisions for **indigenous fish**, over the entire catchment.
- 6 In the Regional Freshwater Plan:
  - rivers to be managed for **natural state purposes** were decided using criteria relating to the absence of modification in the catchment and in the river;
  - rivers to be managed for **indigenous fish species** were decided by the presence of threatened fish species identified in the National Freshwater Fisheries Database; and
  - rivers to be managed for **trout fishery and trout spawning purposes** were decided using data supplied by the Wellington Fish and Game Council on the use of rivers by trout fishers; and
  - rivers to be managed for **contact recreation purposes** were based on surveys of recreational users.

