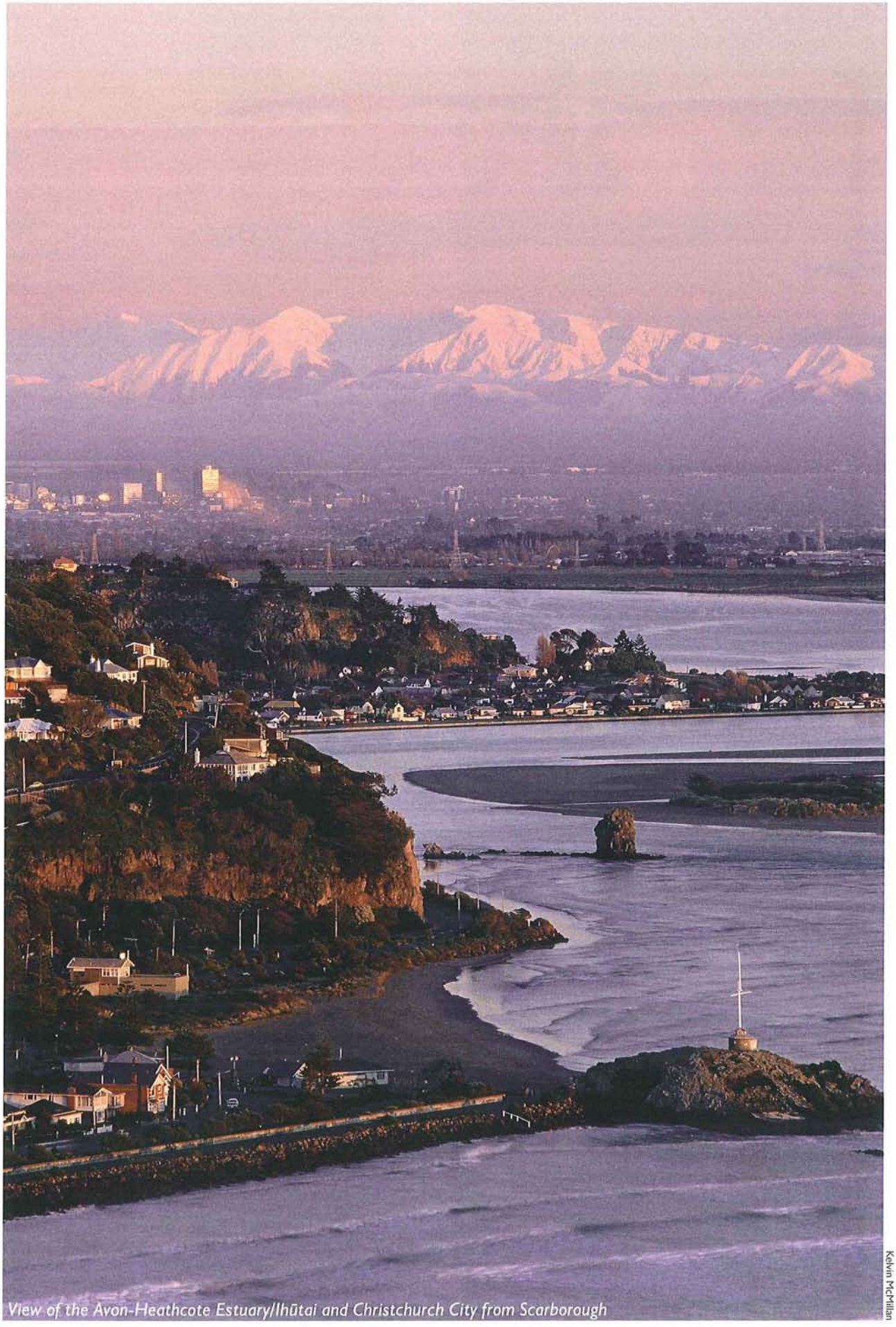
Shelley McMurtrie

1 Introduction



View of the Avon-Heathcote Estuary/Ihūtai and Christchurch City from Scarborough

Kelvin McMillan

1.1 How to Use the Guide

The Christchurch City Council's Waterways, Wetlands, and Drainage Guide comprises two volumes, Part A and Part B. Both parts integrate a wide range of disciplines, experience and expertise, and reflect a multi-disciplinary approach to the protection, restoration, management, and design of waterways and wetlands (of which the main systems are shown in Figure 1-1).

Part A Includes:

- principles and background information for inter-disciplinary planning and management
- site assessment, developing visions, and a summary of the planning process
- procedures for involving the community
- best practice examples of managing waterways.

Part B Includes:

- information on the impacts of urban and rural development on waterways and wetlands
- information on habitat preferences of birds, fish, and invertebrates found in the Christchurch area
- detailed information for design and management of each component of the waterways, wetlands, and drainage system.

Parts A and B are closely interlinked, neither should be regarded in isolation from the other. In order to reflect the evolving nature of research and technology, Part B particularly, has been designed as a living document, enabling updates of sections to reflect current research and improved practical applications.

1.1.2 A Precis of Part B

Table 1-1 gives an overview of the contents of Part B.

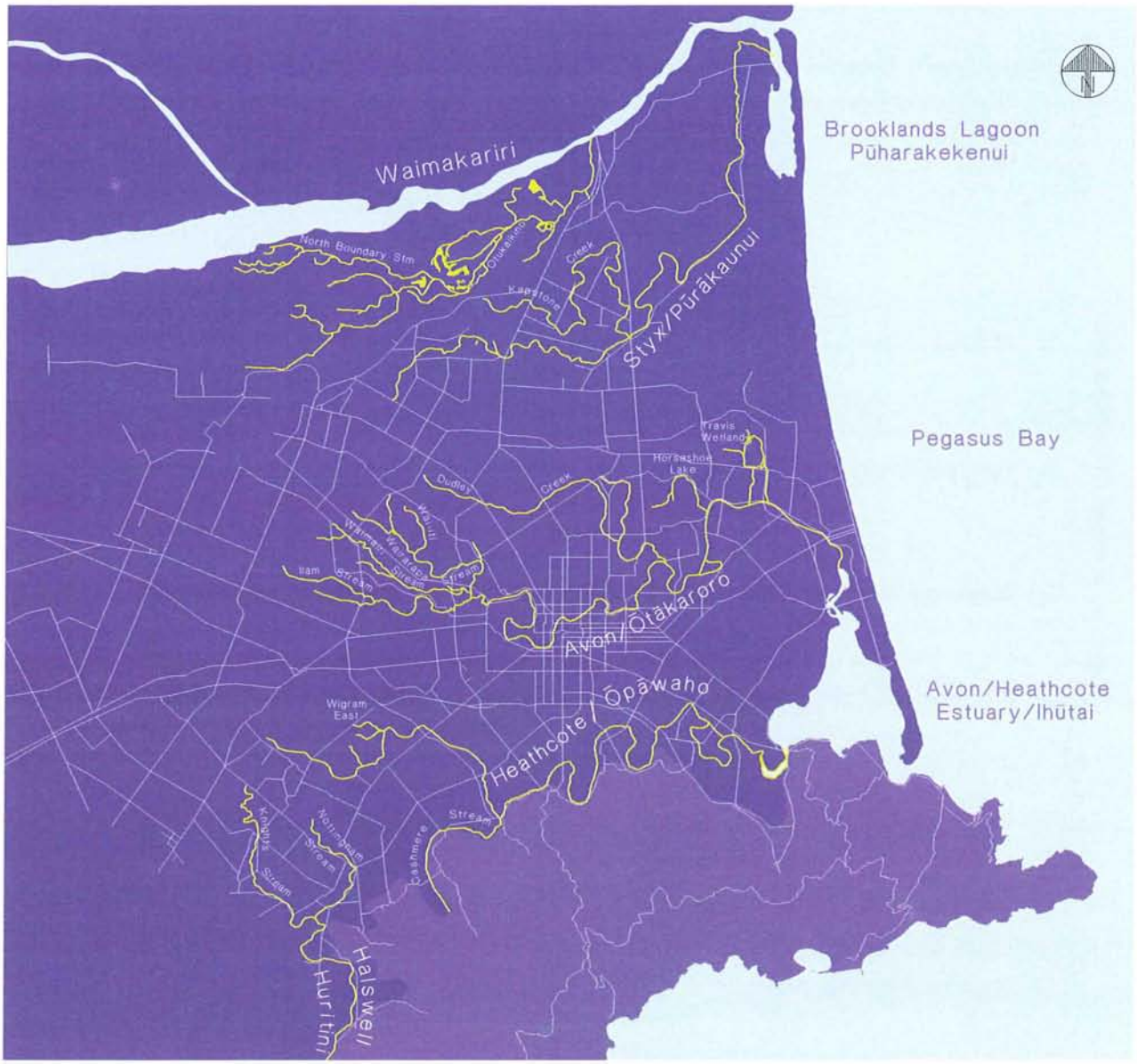


Figure 1-1: Main waterways and wetland systems in the Christchurch area.

Table 1-1: Part B precis of the Waterways, Wetlands, and Drainage Guide.

	Chapter Name	General Description
Background Information	1: Introduction	Introduction and overview of the contents of Part B.
	2: Impacts of Development	Outlines the general impacts of development (urban and rural) on the ecology for both waterways and wetlands.
	3: Fish, Invertebrates, Birds, and their Habitat	Outlines the general habitat preferences of the main groups of invertebrates, fish, and birds found in Christchurch. Also suggests ways of improving bird habitat, for both bush birds and wetland birds.
	4: Soils and Geomorphology of Christchurch	Outlines the evolution of the surface and sub-surface landform. Outlines the importance of soils in urban, waterway, and wetland restoration design.
Waterway Design Considerations	5: Surface Water and Groundwater Interception	Details the interception of surface water and groundwater, including roadside drainage (vegetated swales), hillside interception channels, and subsoil drains.
	6: Stormwater Treatment Systems	Details the design, management, maintenance and monitoring considerations for the following stormwater treatment systems: • soakage systems (on-site soakage chambers, soakage basins, overflow soakage chambers) • detention basins (wet ponds and dry basins) • constructed wetlands.
	7: Hill Waterways	Details design considerations specific to Port Hill waterways. This includes bank and channel stabilisation techniques, such as structural and vegetative methods.
	8: Lowland Waterways	Details the Christchurch City Plan waterway categories, and outlines general considerations for lowland waterway restoration. Read this overview chapter prior to reading Chapter 9.
	9: Restoring Waterway Form	Details all possible design considerations for waterway restoration or naturalisation. Introduces all design factors that can be beneficial for creating a more natural stream, and that should be considered when planning any waterway restoration or when developing near a waterway system.
	10: Restoring Wetlands	Provides an overview on the different types of wetlands found in Christchurch. Introduces the design and management considerations for protecting, restoring, and creating wetland environments.
	11: Riparian Planting	Details factors for consideration when undergoing riparian planting. This chapter is therefore particularly applicable to Chapters 7–10.

Table 1-1 continued: Part B precis of the Waterways, Wetlands, and Drainage Guide.

	Chapter Name	General Description
Waterway Design Considerations	12: Waterway Erosion Protection	Introduces the natural processes of erosion in waterways, and the impacts of development on these erosive forces. Outlines different erosion protection methods, including bed stabilisation and bank protection (bank re-grading and various types of retaining walls).
	13: Waterway Structures	Details structures relating to waterways. Includes culverts and bridges (including the design of fish friendly culverts and weirs), fords, grills (including safety, debris separation, design criteria), floodgates, pumping stations, stop banks, and fences adjacent to waterways.
	14: Pipeline Structures	Details structures not directly relating to waterways. Includes the detailed design of pipelines (stormwater gravity and pressure pipes), manholes, sumps, and pipe inlet and outfall structures.
Other Considerations	15: Safety	Outlines safety considerations that apply to most chapters within Part B.
	16: Public Access	Outlines the planning and design considerations for providing public access.
	17: The Consent Process	Details how to apply for a building consent, and describes the different types of resource consents used for waterway and wetland design in Canterbury. These consents are issued by the Christchurch City Council and Environment Canterbury.
	18: Mosquitoes and Other Insect Pests	Outlines design considerations that may discourage the proliferation of insect pests such as mosquitoes and biting midges, and how to report an insect problem.
	19: Operation and Maintenance	Provides general information on the operation and maintenance requirements set out elsewhere in the guide. Includes a general operation and maintenance manual checklist.
Technical Information	20: Inundation Design Performance Standards	Sets out design standards for the management of water levels to an acceptable level of inundation risk for various land use types.
	21: Rainfall and Runoff	Describes how to determine design rainfall intensity, runoff rates, and rainfall hyetographs for use in sizing waterway components or as input to more detailed hydraulic analysis.
	22: Hydraulics	Covers some specific aspects of hydraulic design such as Manning's roughness coefficient, outfall water levels, scour velocities, riffle design, and the hydraulics of structures such as bridges, sumps and weirs. Designers are referred to standard hydraulics textbooks for procedures by which flow depth, velocity, and energy state can be analysed.