



Nichols Falls

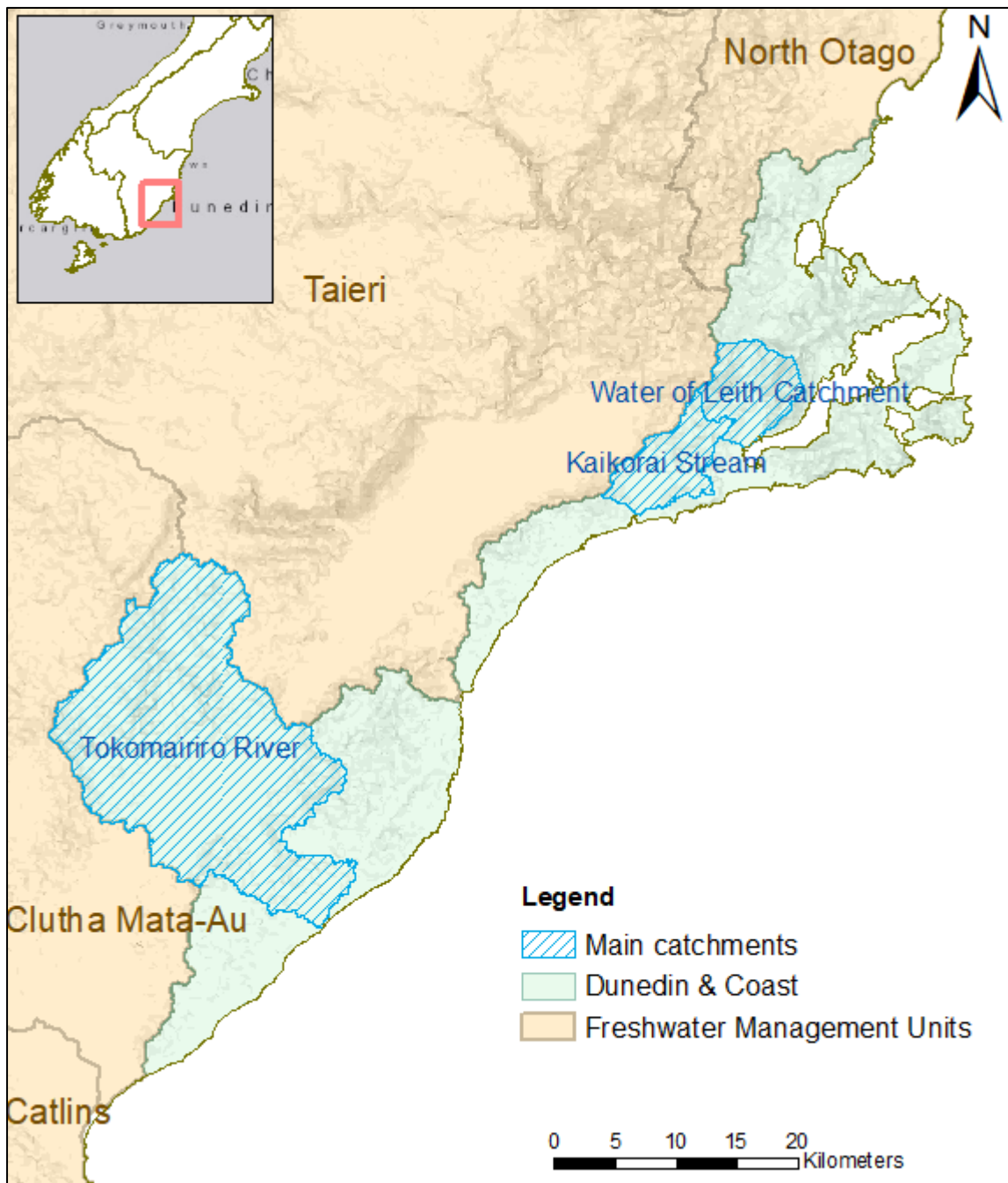
Dunedin & Coast Freshwater Management Unit (FMU)



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Map



Introduction

The Dunedin & Coast FMU runs from Karitane in the north to the Clutha/Mata-Au mouth in the south. The distinctive FMU encompasses Dunedin City, the largest urban area with the largest population in Otago. It also contains diverse, natural coastal features and habitats such as the Otago Harbour & Peninsula, coastal catchments, and seven estuaries. The main catchments

are the Waitati River, Leith Stream and Kaikorai Stream catchments within Dunedin City and the Tokomairaro River in the southern part of the FMU.

The Dunedin & Coast FMU has many outstanding features, including the natural character and form of coastal landscape (e.g., Otago Peninsula), ecological values including forests (cloud forests of the Leith and Ōrokonui Ecosanctuary), healthy estuaries (e.g., Hoopers/Papanui, Blueskin, Tokomairaro, Akatore, Purakaunui), wetlands (e.g., Swampy Summit Swamp), notable wildlife (e.g., hoiho, northern royal albatross, seals, sea lions, red-billed gulls, black-billed gulls), and healthy marine habitats. It is also home to threatened species (e.g., lamprey in coastal streams). The urban streams (Water of Leith, Lindsay's Creek and the Kaikorai Stream) have catchment-specific water quality issues due to infrastructure and stormwater runoff from urban surfaces.



Australasian bittern (source: birdoftheyear.com)

FMU statistics

- Land area is 1,112 km²
- Average rainfall is 738 mm per year
- Climate is marine-temperate

Land use and soils

The Dunedin & Coast FMU contains high-producing grassland (44%) used for grazing (wool, lamb, beef, dairy) and deer farming. Areas of plantation forestry (27%) and native cover (15%) are also widespread. While this FMU has the most significant urban centre in Otago, it comprises only 4% of the land area.

The predominant soil orders in the FMU are Brown and Pallic soils which cover 48% and 39% of the FMU, respectively. They include the north and south of Dunedin City and most of the Tokomairaro catchment. Brown soils are well drained with moderate permeability. The main land cover where these soils are found in the FMU is plantation forests. Pallic soils have poor drainage and moderate to slow permeability. These soils are mainly used for high-producing grasslands. Melanic soils are predominant around the Otago Harbour, are well-drained, and have moderate to rapid permeability.

Water Quantity

Surface water use in the Dunedin & Coast FMU is relatively low. In the northern part of the FMU, the Dunedin City water supply includes water take consents on the Leith and Waitati catchments. However, as most of the city's water supply currently comes from the neighbouring Taieri FMU, these takes are now only for emergency supply and are not presently used. In the southern part of the FMU, surface water is used for dairy sheds and stock water, mining and landfill activities, rural domestic water supply, and a small amount of irrigation.

Surface Water Quality

Water quality is monitored at eight river/stream sites, and ecological monitoring is undertaken at three river sites in the Dunedin & Coast FMU. The results of this monitoring indicate high bacteria and nutrient concentrations at many sites. The Kaikorai and Leith streams within the Dunedin urban area fail to meet the national bottom line for the macroinvertebrate community index (MCI). The trend analysis shows that these urban streams are continuing to degrade. However, the sites in rural parts of the FMU indicate improving trends.



Kaikorai Stream at Brighton Road

Groundwater

Similar to surface water, groundwater use in the FMU is also low. The primary groundwater resource in the FMU is the Tokomairaro Groundwater Management Zone, and the main uses include domestic supply, stock water, irrigation, and dairy sheds. The consented allocation is a small proportion of the current Mean Annual Recharge. Quarterly monitoring results generally show good groundwater quality, with low E. coli and nitrates. However, there is only one monitoring bore in the FMU currently.

Biodiversity

Dunedin is known as the “wildlife capital of New Zealand” due to the rare and endangered species near the city. The FMU has areas of outstanding biodiversity, including the Otago Peninsula, a globally renowned wildlife and eco-tourism destination, and Ōrokonui Ecosanctuary, a wildlife reserve where rare species can be found, including forest birds, reptiles, and plants.

Rare and threatened freshwater ecosystems within the Dunedin & Coast FMU include lagoons, dune slacks, estuaries, and wetlands. Little is usually known about the extent and condition of many of these ecosystems; however, they are often threatened by the pressures of land use change and invasive alien species.

The Dunedin & Coast FMU contains many species that depend on freshwater habitats, including fishes, invertebrates, plants, and birds. Native freshwater fishes include three non-migratory galaxias, four migratory galaxias (whitebait), two eel and five bullies. The lamprey and all non-migratory galaxias in this FMU are threatened. Freshwater invertebrates include koura, shrimp, and mussels. Threatened freshwater-dependent plants include *Crassula peduncularis*, *Gunnera hamiltonii*, and *Leptinella nana*. Many native birds depend on freshwater ecosystems, as permanent or transient (migratory) individuals or populations, including the threatened Australasian bittern and the at-risk black-billed gull. Information is often missing at a species level, particularly for freshwater invertebrates, non-vascular plants, and algae. Exotic fishes include goldfish, perch and four salmonids. Many native freshwater species are under threat and continue to decline.

Estuaries and coastal lagoons

There are seven estuaries within the Dunedin & Coast FMU, ranging from natural to modified ecosystems depending on the surrounding land use. Tokomairaro and Kaikorai estuaries are the most impacted by sedimentation and nutrient enrichment due to upstream land use and have “fair” and “poor” state gradings, respectively. The Kaikorai estuary, has experienced high modification and habitat loss due to urban development. The Blueskin Bay catchment is less modified, with native and plantation forests and low-intensity agriculture. Consequently, this estuary is in a “good” state, although it is vulnerable to habitat loss and modification of estuary margins. Papanui and Hoopers inlet both have large seagrass beds, which is a good sign of estuarine health; however, like all estuaries, they are susceptible to human activity and vulnerable to modification.

The Dunedin & Coast FMU also contains several coastal lagoons; however, little is known about most of these ecosystems. The Tomahawk Lagoon is a regionally significant wetland

and wildlife sanctuary under stress from nutrient and habitat alteration and experiences harmful algal blooms.



Papanui Inlet