

New Zealand Freshwater Fisheries Report No. 94

Fisheries investigations of the Ashers - Waituna, Benhar, and Hawkdun lignite deposit areas



Fisheries investigations of the
Ashers-Waituna, Benhar, and Hawkdun
lignite deposit areas

by

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SUMMARY

The Liquid Fuels Trust Board is investigating the suitability of 3 lignite deposits in Otago and Southland to support a coal-to-liquid-synthetic-fuel conversion plant. As part of these investigations, biological surveys of the waterbodies associated with each deposit area were undertaken during 1985 by fisheries staff, under contract to the Board. The study areas were Ashers-Waituna near Invercargill in Southland, Benhar near Balclutha in south Otago, and Hawkdun near St. Bathans in central Otago. The objectives of the study were to evaluate the significance of the aquatic habitats at each site, and to rank the 3 areas for the severity of the biological impact which would follow the development of a lignite mine and associated processing plant.

The study areas were found to contain differing types of aquatic habitat. The Ashers-Waituna lignite deposit lies next to Waituna Lagoon, an unmodified estuary with several tributary streams which provide extensive, high quality spawning habitat for a large number of migratory brown trout. These streams also support stocks of giant kokopu (*Galaxias argenteus*). The nearby lower Mataura River and its outlet, Toetoes Harbour, could be affected by the abstraction of water for use in a synfuels processing plant, and by the discharge of effluent. The Mataura supports a nationally important recreational brown trout fishery, which is currently the subject of a National Water Conservation Order application. It also supports regionally important recreational and commercial whitebait fisheries, and a diverse number of other estuarine and freshwater fish species.

Of the 3 sites investigated, Ashers-Waituna has the highest biological values. Lignite development here would have severe effects, especially if salt water should intrude into the ground water as a result of mine dewatering, or if the Waituna Creek catchment was disturbed by mining.

The Benhar lignite deposit lies beneath Lake Tuakitoto, which is a significant freshwater lake and wetland complex of a size which is becoming increasingly rare in New Zealand. The lake contains a sizeable stock of short- and long-finned eels, which sustain a commercial fishery. Giant kokopu have been recorded from 2 of the

tributary streams. The lake is currently the subject of a National Water Conservation Order application on the basis of its outstanding importance as a wildlife habitat. Of the 3 sites investigated, the aquatic biological values here were ranked as medium. However, this site would suffer the greatest on-site impact if lignite mining were to proceed. The lake would be drained completely, and the lower reaches of inflowing tributary streams would be destroyed.

The Hawkdun lignite deposit is situated within the upper Manuherikia catchment, above the Falls Dam reservoir. Only 4 fish species are to be found in the study area, because access for migratory species is blocked by the dam. All fish species are common throughout the region, although the co-existence of mixed populations of brown trout and brook char in tributary streams is unusual in New Zealand. Hawkdun is considered to be the least environmentally sensitive site for lignite development. Its aquatic biological values were the lowest of the 3 sites investigated, and development there would have considerably less effect than it would at Ashers-Waituna or Benhar.

If a lignite mine and synfuels facility were to be developed in the South Island, the Hawkdun site should be selected, because its aquatic environments and values would be the least affected.

1. INTRODUCTION

1.1 Background

This study was part of the Liquid Fuels Trust Board (LFTB) Phase II site-specific studies of 3 Otago/Southland lignite deposits, and was commissioned by the LFTB in January 1985.

Aquatic biology studies were part of the LFTB's Category 5 studies, and were undertaken jointly by staff from the Freshwater Fisheries Centre (FFC), the Otago Acclimatisation Society (OAS), and the Southland Acclimatisation Society (SAS), from January to August 1985.

1.2 Study Areas

Of the 10 lignite deposits identified in the Otago/Southland region, the LFTB selected 3 for Phase II site-specific investigatory work. These deposits comprised Ashers-Waituna in Southland, Benhar in South Otago, and Hawkdun in Central Otago (Fig. 1). The study areas defined at each deposit site by the LFTB are shown in Figures 2, 3, and 4, and have 3 components: the boundary delineating the extent of the lignite deposit, the boundary of the proposed mine site within the deposit area, and the dump site. However, for the purposes of this investigation, the study area at each site was extended beyond these boundaries, so that whole catchments were included in the field surveys. Further, at each locality, the sites proposed for water abstraction to supply a potential synfuels processing plant, together with their downstream catchments, were included in the broader study area, although aquatic biological surveys of these areas were conducted at a fairly superficial level. The wider study areas are described in Section 2.

1.3 Objectives

The purpose of this study was to increase the data base for each of the 3 lignite deposit sites to an approximately equivalent, but minimal, level. Information from this and other baseline studies, together with selection of the conversion technology preferred for development of a commercial-sized synfuel facility, will enable a decision to be made as to which deposit should be investigated in more detail.

The overall objective was to rank each of the 3 deposits with respect to the potential impact of a lignite synfuel development on the aquatic environment.

The study tasks defined by the LFTB were to:

1. Compile an annotated bibliography of all published references available and relevant to the aquatic biology of the 3 study areas. Document the findings of the literature search.
2. Informally interview local people with relevant local knowledge of the 3 areas.

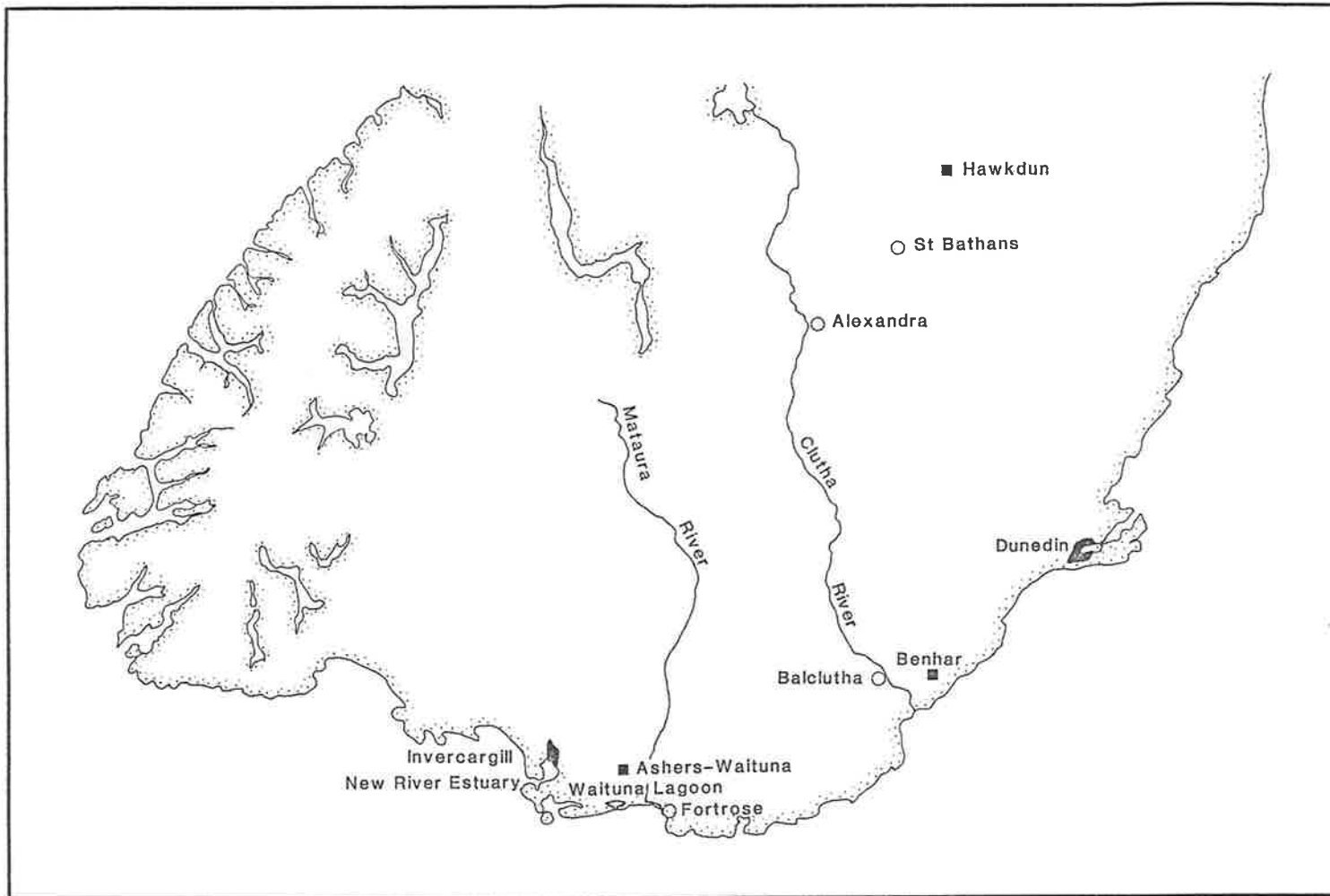


FIGURE 1. Location of lignite deposit areas.

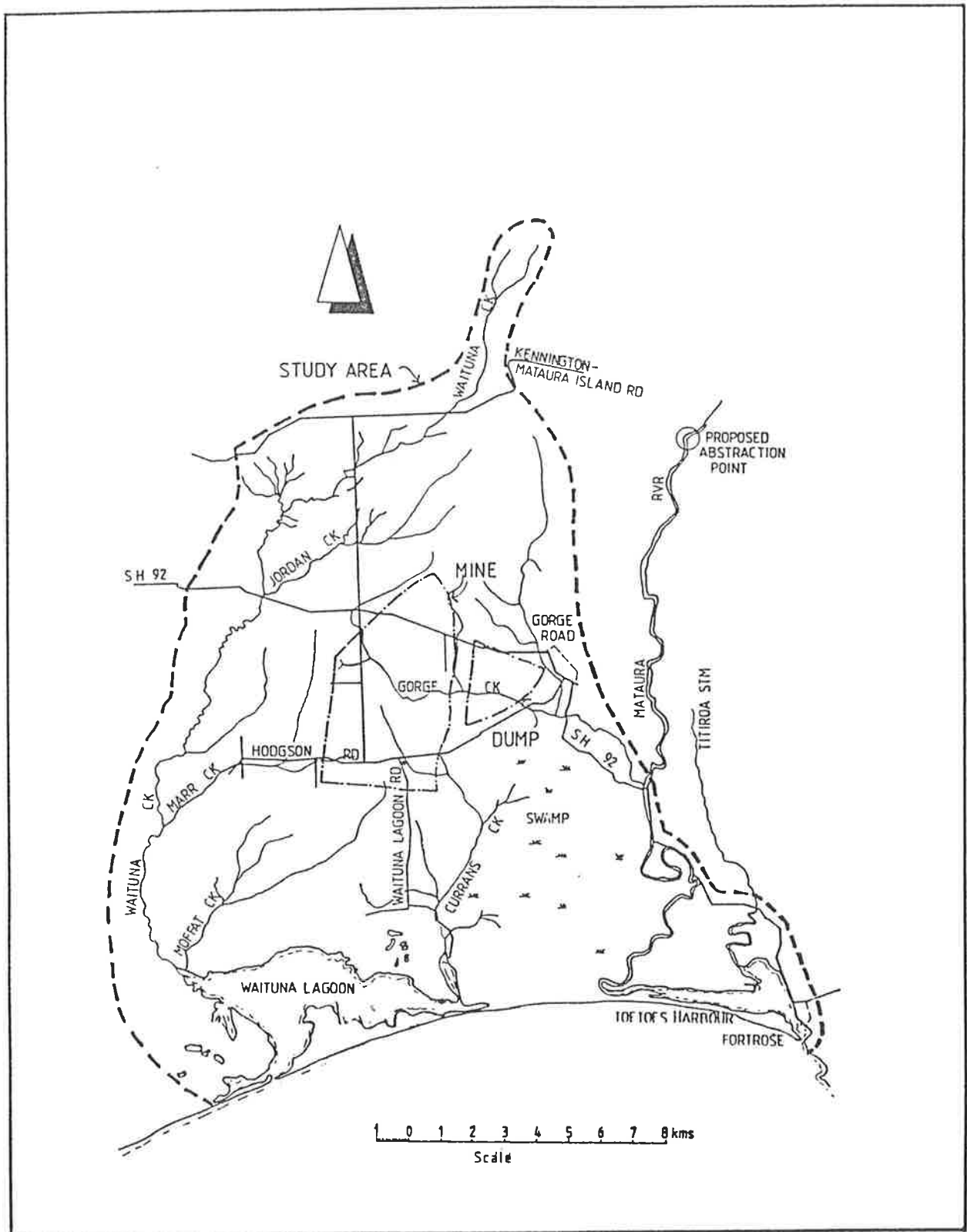


FIGURE 2. Ashers-Waituna lignite deposit area, and proposed mine and dump sites.

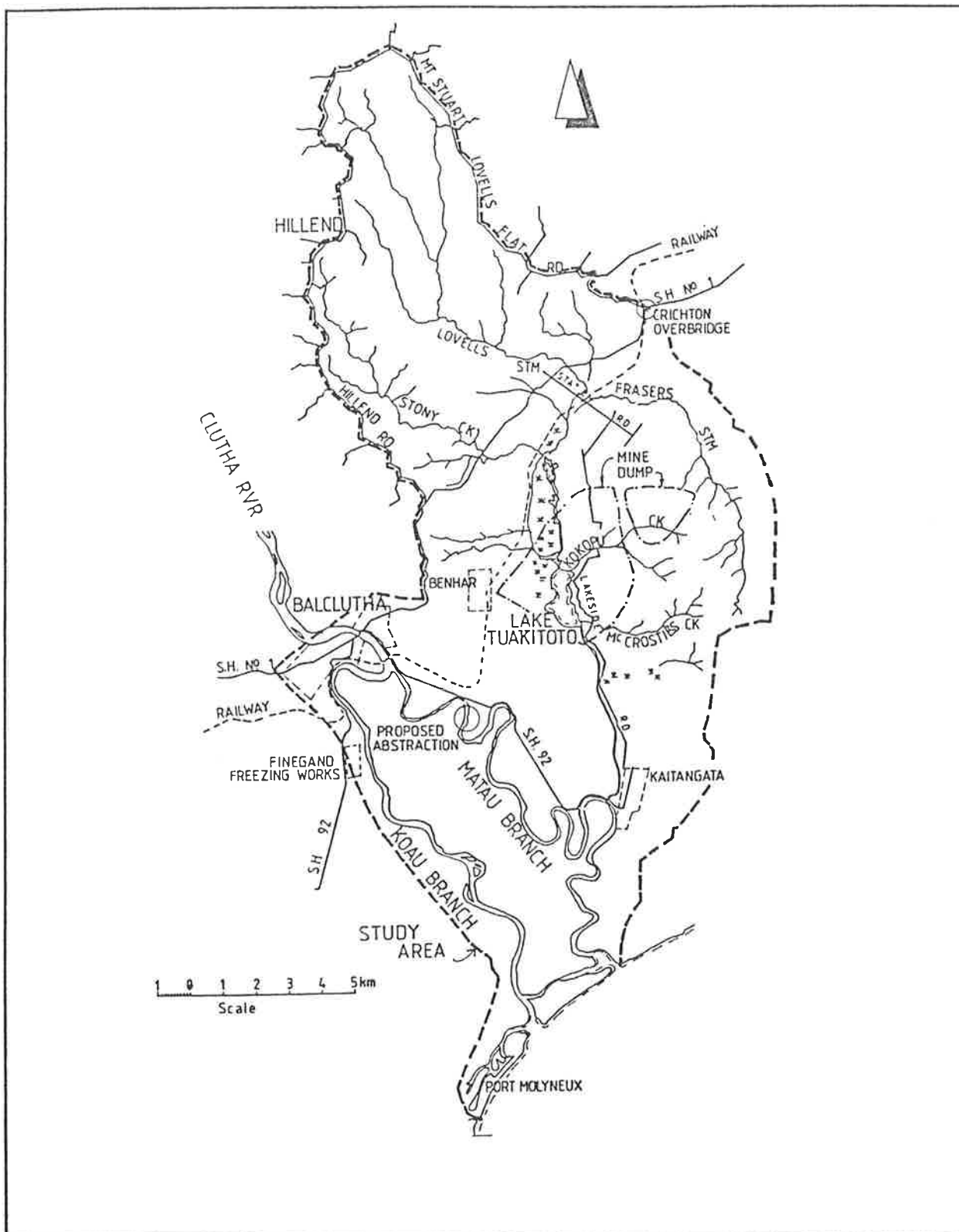


FIGURE 3. Benhar lignite deposit area, and proposed mine and dump sites.

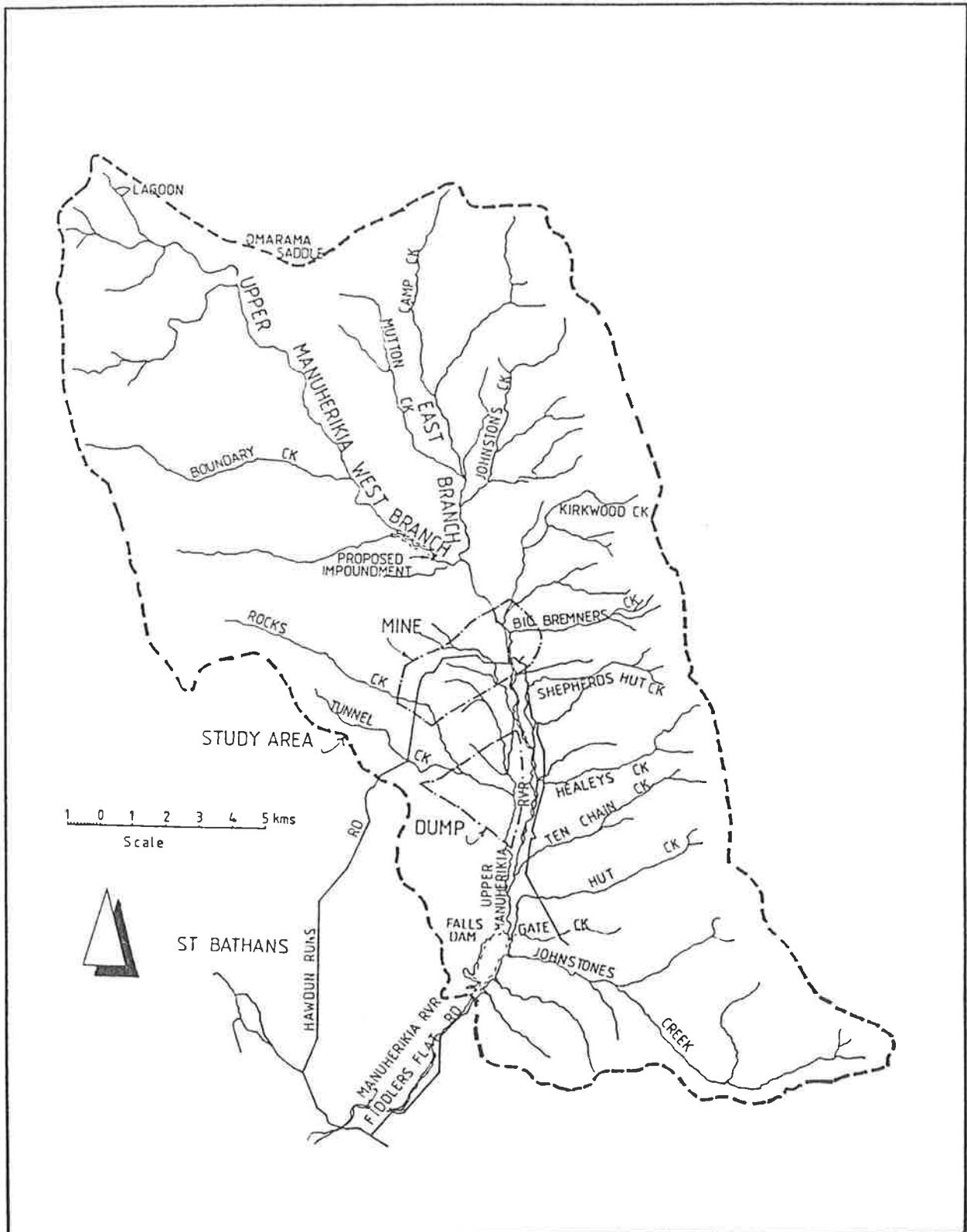


FIGURE 4. Hawkdun lignite deposit area, and proposed mine and dump sites.

3. Describe the aquatic habitats of each site.
4. Compile an inventory of principal and significant species found in the habitat types described.
5. Comment on the rare or endangered species found, or suspected to exist, within the 3 study areas.
6. Derive an 'importance index' for each habitat type. Compare each type with similar types in the area, and consider the local, regional, and national importance of each habitat. Derive a subjective importance rating for each type.
7. Comment on the possible consequences of water extraction from the Mataura and Clutha Rivers, in the cases of Ashers-Waituna and Benhar, and on water impoundment in the case of Hawkdun.
8. Derive comparative indices for each site to rank the 3 areas in terms of aquatic biological significance and the severity of impact following possible development. Develop an aquatic biology/habitat alteration matrix.
9. Outline suggested mitigative measures which could help to lessen the environmental impact on aquatic communities.

2. HABITAT DESCRIPTION

2.1 Ashers-Waituna

2.1.1 Study Area

Figure 5 shows the location of the Ashers-Waituna lignite deposit, the proposed mine site, and the associated dump area. The deposit lies under the headwaters of Waituna, Moffat, and Currans Creeks (which drain into the tidal Waituna Lagoon), and Gorge Creek, a tributary of the lower Mataura River. The boundaries of catchments that would be affected by lignite development are also shown. The wider study area, then, includes Waituna Lagoon, the lower Mataura River (the tidal zone below the confluence with Gorge Creek), and bog ponds scattered to the west and north of Waituna Lagoon.