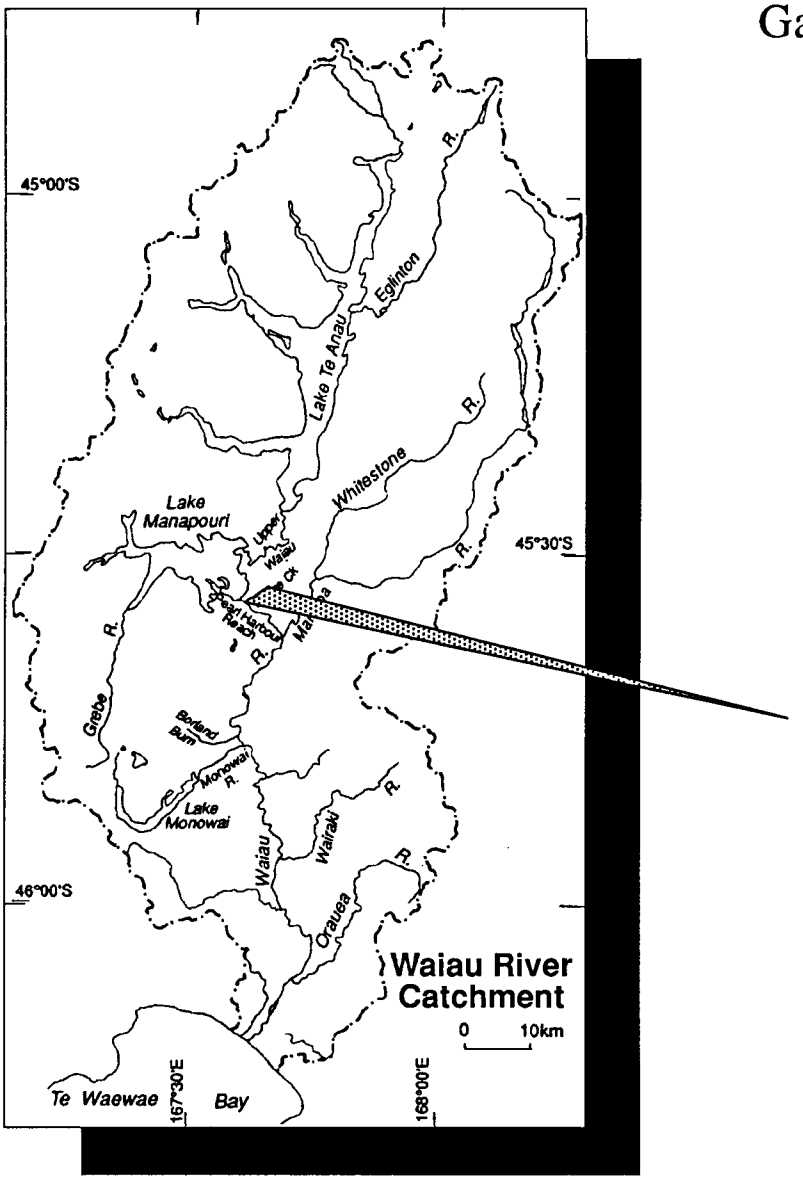
HOME CREEK
Reach Analysis

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Home Creek

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REACH NAME : HOME CREEK REACH

Geographic description of reach : Home Creek was analysed from the margins of Kepler Mire down to Waiau River confluence. Home Creek differs from other tributaries studied in Waiau River catchment in that it is a sand-dominated system that drains a low-lying former lake bed. Three subreaches of Home Creek are identified. The upstream reach extends from Kepler Mire down to Hillside-Manapouri road bridge. This is a sinuous channel within a narrow channelized zone with well-vegetated banks. Downstream of Hillside-Manapouri road bridge, adjacent to Freestone Hill, Home Creek adopts a much more sinuous course, as the width of the active chanel zone and adjacent alluvial flats increases. In the 600-800 m river section upstream of Waiau River confluence, Home Creek drops down a fairly steep terrace riser. In this subreach Home Creek maintains a very sinuous course, within well-vegetated banks.

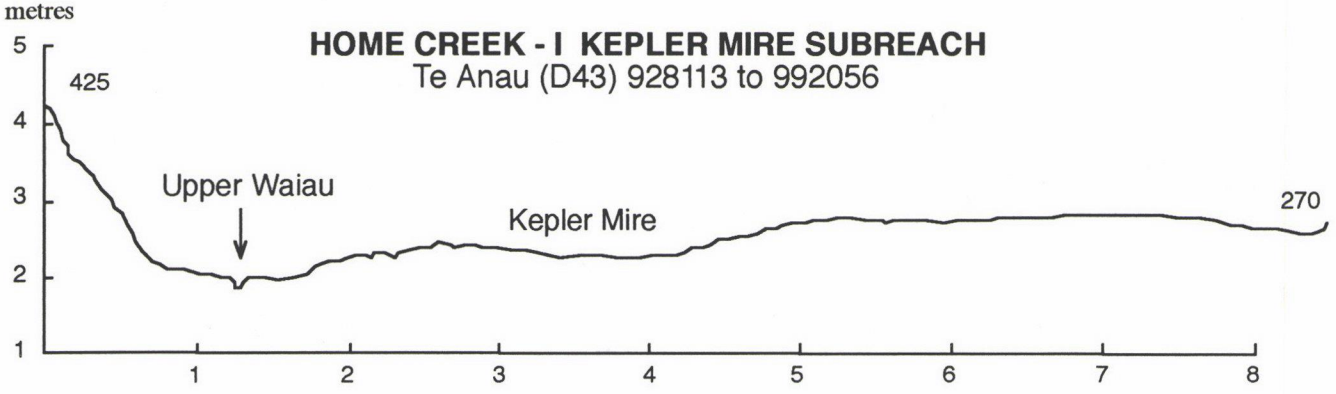
Analysts : GB, AB, AH, BJ Date of Analysis : 22.01.93

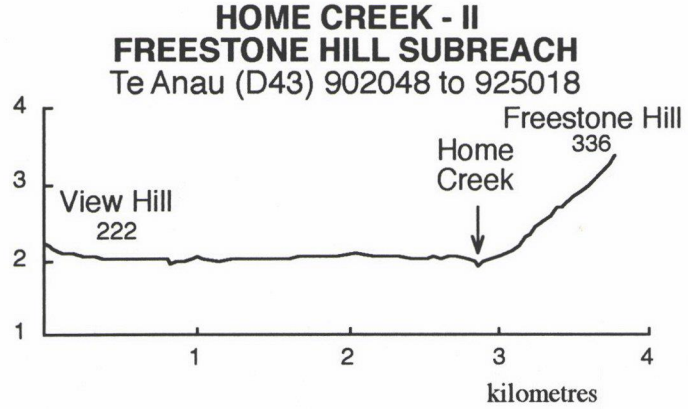
Grid co-ordinates of reach : Te Anau 1:50,000, GR 954059 to 903013

Three subreaches are identified :	Kepler Mire subreach	GR 954059 to 921028
	Freestone Hill subreach	GR 921028 to 904017
	Home Creek Confluence subreach	GR 904017 to 903013

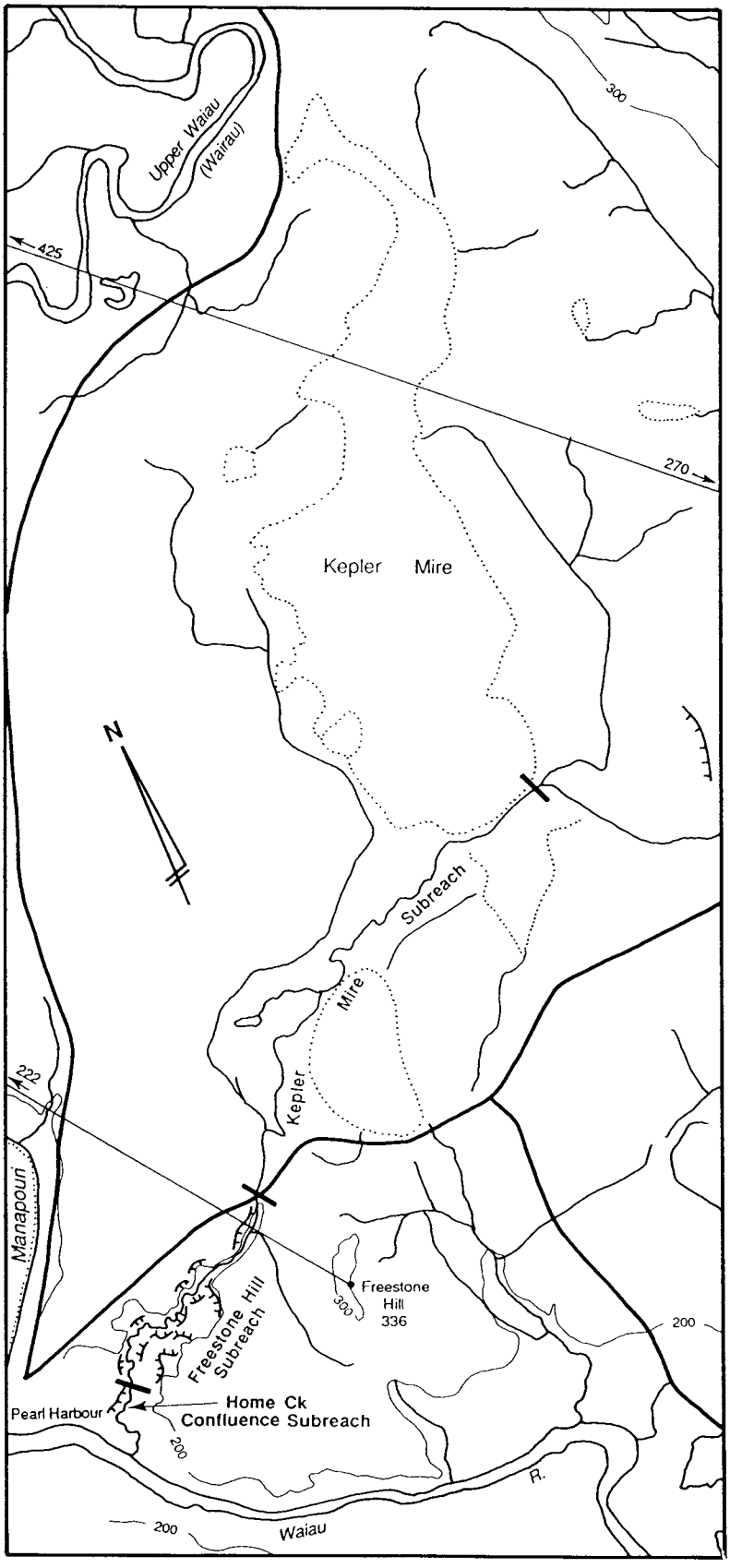
VALLEY CHARACTERISTICS

Valley cross section





HOME CREEK Te Anau (D43) 1:50,000



0 1 2km

LEGEND

- Road
- 500 Contours (metres)
- Terrace riser
- Creeks / rivers
- Cross section
- LB Sample location
- Reach margin
- Catchment margin

Valley setting
Upstream of Hillside-Manapouri road bridge Home Creek drains an extensive area of low-lying terrain with large swamps and manuka stands. This is the site of a former lake-bed, that evolved during glacial conditions, with which a string bog, Kepler Mire, has developed. Narrow ridges adjacent to Kepler Mire record differing styles of glacial deposition. Downstream of the bridge, Home Creek is incised into relatively loose sands and gravel flats from the old lake-bed sequence interbedded with river deposits. While the overall valley setting is basically flat, the channel locally abuts aginst tilted sedimentary strata at Freestone Hill.

Extent of Valley flat
Although the valley flats upstream of Hillside-Manapouri road bridge extend up to 7 km wide (between Waiau River and The Ramparts), the extremely limited relief in this area determine that the contributing area to upper Home Creek is relatively small. Downstream of the bridge Home Creek has shifted laterally over a zone about 300 m wide, but the present channel is active over a belt just a few tens of metres wide.

Terrace character
Upper lake-bed flats are continuous and extensive, but lower terrace surfaces are generally discontinuous, with up to four erosion phases evidenced by abandoned meander loops at differing elevations within the same valley cross-section (e.g. GR 914023 to 914025). These old meander loops have given terrace surfaces a hummocky appearance.

Left Bank
No terraces are observed at the reach head, and Home Creek is inset within the upper terrace (lake bed) surface. Adjacent to Hillside-Manapouri road bridge the valley side slopes uniformly down to the channel other than a slight break in slope 2 m above the creek. At the pump house (GR 920027) a discontinuous lower terrace is observed 3-4 m above the channel. Downstream of Freestone Hill (at GR 919026) the upper lake bed surface is about 10 m above the creek, with a discontinuous lower terrace about 5 m high. This lower terrace recurs within bends down to the vegetated lower course of Home Creek (GR 904017).

Right Bank
Immediately downstream of Hillside-Manapouri road bridge (GR 920027) Home Creek is incised 6 m into a sandy terrace. The upper (lake bed) terrace surface is continuous down the valley side to Waiau River. Adjacent to the prominent gooseneck section (GR 912023) a discontinuous 5 m high terrace is observed. This surface extends irregularly down to the vegetated lower course of Home Creek (GR 904017).

Extent of Alluvial flat
Extremely discontinuous, narrow flats on the inside of bends, only locally up to 60 m wide (e.g. GR 912023 to 909022). In most reaches alluvial flats are absent, constituting only the vegetated zone within bends.

Degree and character of channel constriction
The channel zone is almost a groove, as the rate of incision has exceeded the rate of lateral expansion of the channel. This is a little unusual as banks are sandy and easily erodible. The channel is typically about 3 m wide. Many perched meander loops are evident (see terrace outlines at GR 914025 and 912024).

Character and impact of tributary streams
Large numbers of drainage ditches are evident in the swamp zone at the head of Home Creek, but there are no substantive tributaries downstream of Hillside-Manapouri bridge. Drainage of the swamp may have induced greater discharge volumes along the lower course of the creek, as the swamp would have acted as a greater buffer to rapid run-off in the past.

Surficial geology
Glacially-derived deposits are dominant, with a series of discontinuous morainal hillocks at the headwaters (e.g. The Ramparts). The flat-lying landscape to the west and south of The Ramparts is composed primarily of horizontally bedded sands, with some planar and trough cross-beds. A large number of small gravel lenses are observed within the sand bodies. These deposits, referred to as Manapouri Sand, are tens of metres thick. Freestone Hill is an isolated homoclinal ridge composed of tilted calcareous sandstone of Ologocene (early Tertiary) age (McKellar, 1973). A limestone boulder was observed within the present channel, and a granitic boulder was observed on one of the left bank terrace surfaces. These are inferred to be glacial erratics. The likely origin of the limestone boulder is the west side of Lake Te Anau, on the slopes of Mount Luxmore.

Vegetation
Valley side/flats : Predominantly pasture on the upper terrace, but the channel-marginal zone is covered by bracken, cracked willow, coprosma, pinus, carex species (tussocky cutty grass), hebe (korokimo), and flax. Bush lawyer is locally extensive over bracken and coprosma. Ferns are locally extensive on banks. Toi toi and small matagary are observed on the flat in mid-reach. Broom is especially evident on the valley-margin adjacent to the Waiau, and some remnant beech forest is evident. Vegetation is especially dense along the lower course of the river.

Bars/banks : Sedges have been planted adjacent to the channel in the upstream section of Home Creek. Cabbage trees and occasional rimu are evident. Grasses, with local monkey mush (mimulus) and water cress dominate the channel zone downstream. Banks are covered by bracken, cracked willow, coprosma, pinus, carex species (tussocky cutty grass), hebe (korokimo), and flax. Bush lawyer is locally extensive over bracken and coprosma. Ferns are locally extensive on banks.

Land use
Pasture. Air strip on upper flats.

Direct human impacts
The upstream section of Home Creek has been locally straightened, as numerous bends have been cut-off. Rip-rap adjacent to the bridge has protected not only the banks but has been locally reworked onto the channel bed. The bank upstream of the pump house, and various eroding outer concave banks of bends downstream, have netting to protect against lateral erosion, along with a series of willow plantings. Experimental willow plantings (matsudama) have been applied in the section immediately adjacent to the pump house.

Other comments
A large delta has accumulated at Waiau River confluence.

1) KEPLER MIRE SUBREACH (Te Anau, GR 954049 to 921028)

CHANNEL CHARACTERISTICS

Number of channels : Single channelled throughout the reach, although some abandoned (cut-off) channels are evident.

Channel geometry : Regular throughout the reach, with limited within-channel sedimentation.

Sinuosity : Home Creek flows through a series of relatively tortuous bends at the exit from Kepler Mire. Localized straight reaches have been imposed as drainage ditches. Accordingly, sinuosity is locally variable, and the 2 km section upstream of Hillside-Manapouri reach is less sinuous than the upstream section.

Lateral stability of channel(s) : The channelized zone is quite narrow, with well-vegetated margins. The channel appears to be very stable within this zone.

Bar type and scale
Within-channel sedimentation is negligible, other than a small metre-scale point bar on the inside of a broad bend.

Bed/Bank character (extent and materials)
Banks are generally 1-2 m high and are densely vegetated. The channel bed is composed of sands with occasional fine gravel sheets. Vegetation is also abunant within-channel.

Flow character
Typically uniform, regular flow.

SAMPLE SITE CHARACTERISTICS

No gravel bars are evident along Home Creek.

Home Creek Photo 1, Kepler Mire subreach
Kepler Mire, a string bog, forms the headwaters of Home Creek, which flows from left to right in mid-photo.
16.01.93 GBF 3-34 Te Anau (D43) 1:50,000, GR 950050



Home Creek Photo 2, Kepler Mire subreach
Headwaters of Home Creek. Note the well defined, better vegetated channel zone, set among near featureless swamp.
16.01.93 GBF 3/32 Te Anau (D43) 1:50,000, GR 952048



Home Creek Photo 3, Kepler Mire subreach
Densely vegetated channel margins, with abundant tussocks. Home Creek is a very stable channel, with low width:depth.
30.01.93 9-22 Te Anau (D43) 1:50,000, GR 956051



Home Creek Photo 4, Kepler Mire subreach
Within-channel sedimentation is negligible in the upstream end of Home Creek. The bench in mid-photo marks the only recent sand/fine gravel accumulation observed in the upper reach of Home Creek. View looking upstream.
30.01.93 9-23 Te Anau (D43) 1:50,000, GR 953048



Home Creek Photo 5, Kepler Mire subreach
View downstream of Kepler Mire subreach. Note the extremely low sinuosity, single channel of Home Creek.
30.01.93 9-24 Te Anau (D43) 1:50,000, GR 945046



Home Creek Photo 6, Kepler Mire subreach
View upstream of Home Creek. Some sections of Kepler Mire subreach have been artificially straightened, and appear almost as ditches, with several bends short-circuited.
30.01.93 9-21 Te Anau (D43) 1:50,000, GR 944044



Home Creek Photo 7, Kepler Mire subreach
Localized bank undercutting at the downstream end of an artificially straightened section in Kepler Mire subreach.
30.01.93 9-25 Te Anau (D43) 1:50,000, GR 944044



2) FREESTONE HILL SUBREACH (Te Anau, GR 921028 to 904017)

CHANNEL CHARACTERISTICS

Number of channels : Single channelled throughout the reach.

Channel geometry : Regular throughout the reach, with pools at the outside of bends.

Sinuosity : Sinuosity increases down-reach. Bends are frequently tight, often tortuous, with localized straight reaches (e.g. GR 917025 to 914024). Between GR 912023 and 909022 the river flows through a series of goosenecks.

Lateral stability of channel(s) : Although flats are narrow, the river is laterally unstable as it reworks sands and fine gravel banks. Several fencelines have had to be moved away from the channel (e.g. GR 919026). In some reaches with very shallow banks the channel migrates freely. Although the channelized zone is not very wide, the channel is shifting laterally within older abandoned cut-offs. New cut-offs are inevitable, as indicated by the tortuous gooseneck reach upstream of the lower vegetated reach. Indeed, the rate of lateral shifting may well increase over time, as the channel has less bank-derived material to remove as banks become shallower within the lower-terraces. Increased rates of activity in this continuing history of lateral shifting of the channel and development of cut-offs may well have been promoted by clearance of manuka (inducing greater run-off rates) and local bank destabilization along sheep paths.

Bar type and scale
Not evident other than metre-scale point bar accumulations on the insides of small bends.

Bed/Bank character (extent and materials)
Loose sands with fine gravels constitute most banks. These readily erodible materials often form vertical banks, indicating that erosion is presently active. In the gooseneck section (between GR 912023 and 909022) banks are especially shallow. The bed is composed primarily of fine gravels (up to 150 mm). These gravels are locally lensed as within-channel accretion lobes. A large proportion of the bed is sand, especially in pools.

Flow character
Typically uniform, regular flow, with pools at the outside of bends.

SAMPLE SITE CHARACTERISTICS

No gravel bars are evident along Home Creek, although some fine gravel sheets (b max < 50 mm) are evident on sand-dominated point bars.

Home Creek Photo 8, Freestone Hill subreach
The downstream section of Home Creek, extending from Hillside-Manapouri road bridge to Waiau confluence. Pearl Harbour and Lake Manapouri are evident in the background. Note the incision of Home Creek immediately downstream of the bridge, and the abundant meander scars in mid-reach. This oblique aerial photograph was taken positioned above Freestone Hill.
30.01.93 AHF 2/20



Home Creek Photo 9, Freestone Hill subreach
Home Creek at Hillside-Manapouri road bridge, looking upstream. Note the incised nature of the channel, and bank protection structures adjacent to the bridge.
22.01.93 AO 1/36 Te Anau (D43) 1:50,000, GR 921028



Home Creek Photo 10, Freestone Hill subreach
Eroding concave bank of a tight bend downstream of the pumphouse. Erosion nets and planted willows form part of an extensive bank erosion protection program.
22.01.93 7-2 Te Anau (D43) 1:50,000, GR 917026



Home Creek Photo 11, Freestone Hill subreach
Perched, erosional meander scar on the left bank of Home Creek adjacent to Freestone Hill.
22.01.93 7-3 Te Anau (D43) 1:50,000, GR 916024



Home Creek Photo 12, Freestone Hill subreach
In the 1 km reach of Home Creek downstream of Hillside-Manapouri road bridge the channel is moderately incised. Despite this, the creek is laterally unstable and has adopted a sinuous course, with erosion at the outside of bends. The sandy nature of bank/terrace deposits makes the banks highly erodible and sediments are easily transported downstream.
22.01.93 7-5 Te Anau (D43) 1:50,000, GR 914024



Home Creek Photo 13, Freestone Hill subreach
The degree of channel incision is less evident down-reach. Terrace materials in this subreach have already been removed, and the channel has effectively widened its valley and alluvial flats. View upstream.
22.01.93 7-8 Te Anau (D43) 1:50,000, GR 913024



Home Creek Photo 14, Freestone Hill subreach
Bank erosion at the downstream end of Freestone Hill subreach. Alluvial flats in this section are notably wider than upstream. Note the active sand sheets on the point bars in mid-photo. View downstream.
22.01.93 7-9 Te Anau (D43) 1:50,000, GR 913024



Home Creek Photo 15, Freestone Hill subreach
Eroding concave bank in Freestone Hill subreach, with point bar on the convex slope. Note the eroding tracks on the hillslope in mid-photo.
22.01.93 7-11 Te Anau (D43) 1:50,000, GR 913023



Home Creek Photo 16, Freestone Hill subreach
As the extent of alluvial flats increases downstream in Freestone Hill subreach, the channel becomes even more sinuous, and a series of gooseneck bends have developed.
22.01.93 7-12 Te Anau (D43) 1:50,000, GR 912022



3) HOME CREEK CONFLUENCE SUBREACH (Te Anau, GR 904017 to 903013)

CHANNEL CHARACTERISTICS

Number of channels : Single channelled throughout the reach.

Channel geometry : Highly irregular, with much dense vegetation within-channel.

Sinuosity : Home Creek maintains a very sinuous course as it drops down the extremely densely-vegetated Waiau terrace.

Lateral stability of channel(s) : In its lower reach, Home Creek becomes increasingly stable as it flows through a densely vegetated reach (constrained by broom and willows).

Bar type and scale
Not evident in this subreach, but a large shallow delta has accumulated at Waiau River confluence.

Bed/Bank character (extent and materials)
Banks are stable, associated with extensive, dense vegetation. The bed is composed primarily of sands and fine gravels (up to 150 mm). Vegetation is dense both on the banks and as collapsed features within-channel.

Flow character
Flow is irregular, as it is constrained by dense vegetation and fallen trees both off the banks and across the channel.

SAMPLE SITE CHARACTERISTICS

No gravel bars are evident along Home Creek, although some fine gravel sheets (b max < 50 mm) are evident on sand-dominated point bars. A large sand delta has accumulated at Waiau River confluence.

Home Creek Photo 17, Home Creek Confluence subreach
Home Creek channel becomes less well defined downstream, and in the 800 m subreach upstream of Waiau River confluence the channel flows through the densely vegetated zone shown below. Remnant beech forest, broom and willow predominate. Although the channel falls quite steeply in this subreach, it retains a highly sinuous course, thereby increasing stream length and maintaining a steady slope down to Waiau confluence.
22.01.93 7-13 Te Anau (D43) 1:50,000, GR 905019



Home Creek Photo 18, Home Creek Confluence subreach
The upstream limit of the densely vegetated channel margins of Home Creek, about 800 m upstream from Waiau confluence.
22.01.93 7-14 Te Anau (D43) 1:50,000, GR 904107



Home Creek Photo 19, Home Creek Confluence subreach
Densely vegetated channel margins of lower Home Creek.
22.01.93 7-15 Te Anau (D43) 1:50,000, GR 903104



Home Creek Photo 20, Home Creek Confluence subreach
Home Creek-Waiau confluence. The large sand delta is submerged at this high flow stage.
22.01.93 AO 1/9 Te Anau (D43) 1:50,000, GR 903014

