Appendices

1. Appendix 1: Habitat Assessment Field Data Sheets and Key

Habitat Assessment – Field Data Sheet

Site Name:	Site ID:
Date:	Time (NZST):
Sampler(s):	Weather:
Date of last sign. rainfall:	Photo No(s):

Water Quality

METER	
TEMP (oC)	
DO (mg/l)	
DO (%SAT)	
COND (uS)	
SECCHI (m)	

Water Odour

Normal/none	
Petroleum	
Anaerobic	
Sewage	
Chemical	
Water surface oils	
Anerobic sediment odour (H_2S)	

Pfankuch Stability Index

Upper Bank		**Lower bank**		**Bottom**	
Landform		Capacity		Rock angul.	
Mass wasting		Bank rock		Brightness	
Debris Jam		Obstruction		Consolid.	
Vegetation		Cutting		% Stable	
		Deposition		Scouring	
				Aquatic vege	

Riparian Vegetation

Predominant surrounding land use

Native forest	
Native scrub	
Planted forest	
Lifestyle	
Horticulture	
Pasture	
Urban	

Litter present

Evidence of livestock access

Left bank	
Right bank	

Channel Shading (%)	
Filamentous algae coverage (%)	

Qualitative Habitat Assess

1. Aquatic hab abundance	
2. Aquatic hab diversity	
3. Hydrologic heterogeneity	
4. Channel Alteration	
5. Bank stability	
6. Channel Shade	
7. Riparian vege	

Periphyton	Rare	Common	Abundant
Diatom			
Mat algae			
Filamentous algae			
Bryophytes (moss, liverworts)			

Macrophytes	Rare	Common	Abundant

Note: Rare = <10% cover
Common = 10-50% cover
Abundant = >50% cover

Comments:

- fish observed
- fish habitat
- barriers to fish passage
- evidence of stable pools
- catchment erosion
- seaps or springs
- discharges or outfalls
- evidence of grazing stock access
- unique features
- crossings / tracks
- litter, shopping trollies, batteries, tyres
- descriptions of sediment
- stock / feral grazing
- high water marks
- Age / maturity of trees
- Macrophytes identified

Field sheet revised Sept. 2002

Quantitative Habitat Assessment – Field Data Sheet

Quantitative Habitat Assessment **Site:** _____

Scorer: _____ **Date:** _____

Legend	Riparian zone (L)		Bank (True Left)	Aquatic Substrate			Bank (True Right)	Riparian zone (R)	
	5-20m	0-5m		Inorganic				0-5m	5-20m
	Canopy		Stability	Organic			Stability	Canopy	
	Understory		Bank Type	Wetted width (m)	Max depth	Flow type	Bank Type	Understory	
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Field sheet revised Sept. 2002

Qualitative Habitat Assessment – Field Data Sheet

Quantitative Habitat Assessment **Site:** _____

Scorer: _____ **Date:** _____

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Aquatic Habitat Abundance	> 50% of channel favourable for epifaunal colonisation and fish cover; includes woody debris, undercut banks, root mats, rooted aquatic vegetation, cobble or other stable habitat. Also includes macrophyte dominated streams.	30-50% of channel contains stable habitat.	10-30% of channel contains stable habitat.	< 10% of channel contains stable habitat. *Note: Algae does not constitute stable habitat.*
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Aquatic Habitat Diversity	Wide variety of stable aquatic habitat types present including: woody debris, riffles, undercut banks, root mats, rooted aquatic vegetation, cobble or other stable habitat.	Moderate variety of habitat types; 3-4 habitats present including woody debris.	Habitat diversity limited to 1-2 types; woody debris rare or may be smothered by sediment.	Stable habitats lacking or limited to macrophytes (a few macrophyte species scores lower than several).
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Hydrologic Heterogeneity	Mixture of hydrologic conditions i.e. pool, riffle, run, chute, waterfalls; variety of pool sizes and depths.	Moderate variety of hydrologic conditions; deep and shallow pools present (pool size relative to size of stream).	Limited variety of hydrologic conditions; deep pools absent (pool size relative to size of stream).	Uniform hydrologic conditions; uniform depth and velocity; pools absent (includes uniformly deep streams).
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Channel Alteration	Natural channel and meander pattern; no evidence of historic channel alteration e.g. dredging, channelisation stabilisation, or other human activity.	Natural channel. Minimal channel alteration. Channel shape and form may be influenced by recent sediment deposition.	Channelised. Channel form and shape unconstrained. Channel made of natural materials.	Channelised. Channel form and shape constrained by man-made materials (e.g. culverts, gabions, concrete).
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Bank Stability (water level to bank full channel)	Stable: <5% bank effected; evidence of erosion or bank failure absent; minimal potential for future problems.	Moderately stable: 5-30% affected; areas of erosion mostly healed over; some potential for future problems.	Moderately unstable: 30-60% affected; high erosion potential during floods.	Unstable: 60-100% affected; eroded areas along runs and bends; bank sloughing and erosion scars common.
Left bank	10 9	8 7 6	5 4 3	2 1 0
Right bank	10 9	8 7 6	5 4 3	2 1 0
6. Channel Shade	>80% of water surface shaded. Full canopy.	60 - 80% of water surface shaded; mostly shaded with open patches.	20 - 60% of water surface shaded; mostly open with shaded patches.	<20% of water surface shaded. Fully open; lack of canopy cover.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Riparian Vegetation Integrity (within 20 meters)	No direct human activity in the last 30 years; mature native tree canopy and intact native understory	Minimal human activity; mature native tree canopy or native scrub; understory shows some impact (e.g. weeds, feral animal grazing).	Extensive human activity affecting canopy and understory; trees exotic (pine, willow, poplar); understory native or exotic.	Extensive human activity; little or no canopy; managed vegetation (e.g. livestock grazing, mowed); permanent structures may be present (e.g. building, roads, carparks).
Left bank	10 9	8 7 6	5 4 3	2 1 0
Right bank	10 9	8 7 6	5 4 3	2 1 0

Field sheet revised Sept. 2002

Key for field measurements

Aquatic Substrate

Code	Inorganic	Size class
BR	Bedrock	
BO	Boulder	>256mm
CO	Cobble	64-256mm
GR	Gravel	2-64mm
SS	Silt/sand/soft clay	2-0.004mm
HC	Hard packed clay	
MM	Artificial / man-made	

Code	Organic
D	Detritus (including twigs & leaves)
B	Bryophytes
M	Macrophytes
A	Algae (filaments, mats & diatoms)
W	Woody debris (>2.5cm diameter)
R	Tree roots
N	None

Bank Type

Code	Type
E	Earth
R	Rock
MX	Mixed earth & rock
MM	Man-made (concrete, gabions, timber)

Bank Stability

Code	Bank stability
S	Stable
U	Unstable

Flow Type

Code	Type
P	Pool (no detectable flow)
R	Riffle (turbulent flow)
RN	Run (laminar flow)
CW	Chute / waterfall

Riparian Zone

Code	Name	Dominant Canopy Vegetation
MN	Mature Native	Mature native trees (>30 years old).
YN	Young Native	Young native trees (<30 years old).
ET	Exotic Treeland	Exotic trees; commonly willow or poplar.
EP	Exotic Plantation	Plantation forest, principally pine.
N	None	No canopy.

Code	Dominant Understory Vegetation
DN	Dense Native
TN	Thin Native
DE	Dense Exotic
TE	Thin Exotic
N	None

Dense vegetation – difficult to walk through.
Thin vegetation – easy to walk through.