

Inanga/Whitebait

Assessing spawning habitat



Most females inanga only have one opportunity to spawn. If she finds good quality spawning habitat then about 80% of those eggs will survive to start their journey to becoming a whitebait – but if she doesn't find good quality habitat then all of those potential whitebait might be lost.

Historical spawning habitat

At the time of European settlement of New Zealand, the tidally influenced riparian vegetation in inanga spawning areas likely comprised of tall overarching forest and scrub (e.g., kowhai (*Sophora spp.*), patē (*Schefflera digitata*), manatu (*Plagianthus regius*), kahikatea (*Podocarpus dacrydioides*), and ti kouka (*Cordyline australis*), and tall tussock species (e.g., harakeke (*Phormium tenax*), tussock sedges (*Carex secta*, *C. virgata*), and wiwi (*Juncus edgariae*)).

This canopy shaded and sheltered the banks, and supported a loose undergrowth of sedges, herbs and mosses.

It was within the root masses of these sedges and herbs, and associated plant litter, that inanga spawned.

Contemporary spawning habitat

Most riparian zones in New Zealand, and their associated inanga spawning sites, are now dominated by a suite of exotic grasses.

Inanga eggs are frequently attached to tall fescue (*Schedonorus phoenix*) with creeping bent (*Agrostis stolonifera*) and Yorkshire fog (*Holcus lanatus*) usually comprising much lower proportions.

Exotic herbs favoured at spawning sites include clover (*Trifolium spp.*), monkey musk (*Mimulus guttatus*) and buttercup (*Ranunculus sp.*), but these plants rarely dominate the riparian plant community.

HOW TO ASSESS GOOD HABITAT YOURSELF

If you are looking for natural spawning sites, or planning to put in some temporary spawning habitat, then knowing what you're looking at is vital.

On the next two pages you'll find an '**Inanga spawning habitat assessment sheet**' that will help you with this. You will need one assessment sheet per site.

Once you have filled out your location's particulars at the top, there are guidelines to help you assess your site. It covers off twelve different attribute criteria and helps you assign points for your sites current state.



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AQUATIC SCIENCE & VISUAL COMMUNICATION



Inanga spawning habitat assessment sheet

Date: _____ Time: _____ Person: _____

Organisation (e.g. school name etc.): _____

River name: _____ River bank (circle one): **true-right**¹ / **true-left**¹

Site location on river: (choose a permanent marker on the river as a site marker, e.g. a bridge)

Upstream / downstream (circle one) end of site is _____ metres, **upstream / downstream** (circle one)

of (name the site marker) _____

Downstream GPS coords: Northing: _____ Easting: _____

Survey length (metres): _____

- Pre-start check list:
- I have assessed all site hazards & dealt with H&S matters
 - I have checked for saltwater/fish access issues downstream
 - I am in 'the love zone' (i.e., spawning reach) for this river²
 - I know where the 'highwater mark' is at my site²
 - I am assessing the site at the right time of year² (i.e., in spawning season)

My site is within a (circle one): **natural area / rural area / urban area / other** (specify) _____

HABITAT ASSESSMENT (tick ONE score per line item i.e., either 0, 5 or 10 points – then write the score in the righthand column)

Score: →	0 points = BAD	5 points = OK	10 points = GOOD	Your points: write each attributes points here
↓				↓
fish access Check the river between your spawning site and the sea to find out if there is anything stopping the upstream movement of inanga.	tide gate, weir, or other significant barrier to upstream movement of inanga	small drop culvert, section of piped stream, or a partially open tide gate	no barriers	
saltwater access Check the river between your spawning site and the sea to find out if there is anything stopping the upstream movement of saltwater.	tide gate, weir, or other significant barrier to saltwater	small drop culvert, section of piped stream, or a partially open tide gate	no barriers	
bank angle Take the average bank angle over a 1 m band that spans the high spring tide mark. Lay a metre long ruler/pole over the ground (lying perpendicular to the water's edge) and measure your angle off that. Pick a location within your spawning site that is representative or take several measurements and then take an average of those.	less than 7° angle OR more than 35° angle	between 21–35° angle	between 7–20° angle	

¹ The left and right when looking downstream.

² See the 'Inanga/whitebait – Finding natural spawning sites' info sheet for more information.

HABITAT ASSESSMENT continued... (tick ONE score per line item i.e., either 0, 5 or 10 points – then write the score in the righthand column)

Score: →	0 points = BAD	5 points = OK	10 points = GOOD	Your points: write each attributes points here ↓
Attributes: ↓	no good for spawning, or if spawning occurs none of the eggs will survive	spawning will occur but improvement will increase spawning and egg survival	good spawning and egg survival	
bank material What is the DOMINANT material (inorganic) that forms the bank? Assess this over a 1m band that spans the high spring tide mark.	continuous bare rocks, rip-rap, gravel, sand, mud, concrete or wood	mainly patches of earth/loam (soil) but with other material mixed in	continuous earth/loam (soil)	
vegetation cover How much of the ground is covered by living vegetation (i.e., how much of the bare ground underneath is hidden by growing plants). Assess this over a 1m band that spans the high spring tide mark.	Less than 50%	between 50–75%	more than 75%	
vegetation height Take the average of the main/ DOMINANT vegetation in the area. Ignore smaller discrete clumps of larger vegetation. Assess over a 1 m band that spans the high spring tide mark. Measure to the top of where the growth starts to thin out i.e., ignore feathery taller tops.	less than 10 cm (plants are too short and won't be able to keep the ground moist) more than 50 cm (plants are likely too big to be any good as spawning habitat)	between 10–20 cm	between 21–50 cm	
vegetation type Select the DOMINANT vegetation type in that band. Assess this over a 1m band that spans the high spring tide mark.	large woody plants (trees, gorse, blackberry, shrubs), yellow-flag iris, herbs	raupo, flax, carex	pasture grasses/rushes better types for spawning are tall fescue (Schedonorus phoenix), creeping bent (Agrostis stolonifera), and Edgar's rush (Juncus edgariae)	
root mat thickness Use your hands to pull apart the vegetation until you can see the ground. How thick are the vegetation and roots at ground- level? Assess this over a 1m band that spans the high spring tide mark.	Vegetation is very easy to pull apart, no roots growing over the ground surface, low density of plant stems, can see bits of the ground even before you start pulling the plants.	When you pull apart the plant stems you can see areas of bare soil. (i.e., little coverage of root mats over the ground surface)	Vegetation is hard to pull apart. Lots of roots/stems at ground level. (i.e., it is hard to get to the soil below the root mats)	
ground moisture Check the ground at the base of the vegetation to see how damp it is. Assess this over a 1 m band that spans the high spring tide mark.	very dry and dusty	dry in some places	damp or wet	
cover for fish Adult fish congregate before spawning time and need lots of cover to protect them from natural predators. Look in the area between your 1m band and down into the water at the bank. Is there any vegetation growing there, or are any plants overhanging the banks, or large logs or boulders in the water that might provide cover for adult fish?		NO fish cover OR only ONE of the following: – tall plants that would be emergent at high tide – large plants closely over- hanging the water – submerged aquatic plants – logs or large boulders in the water	At least TWO of the following: – tall plants that would be emergent at high tide – large plants closely over- hanging the water – submerged aquatic plants – logs or large boulders in the water	
bank maintenance Are the banks mowed regularly so that the grass is always short at your spawning site?	banks regularly mowed and grass kept short		banks rarely mowed, or mowed more than 2 months before the inanga spawning season	
livestock protection (for rural areas only) Is your spawning site fenced to prevent livestock access?	No sign of any fence of any type; livestock can readily access the banks. There is sign of recent damage from livestock access.	There is a temporary fence installed, but no permanent one (i.e., an electric wire on temporary stakes) OR there is a fence but it is damaged or there is an open gate that allows livestock access to the site (meaning that livestock can get in)	There is a permanent fence that prevents livestock from accessing the site at all times. There is no sign of recent damage from livestock access.	

TALLY UP ALL YOUR ATTRIBUTE POINTS FROM BOTH PAGES HERE →

- A score of 90–120 indicates that the spawning habitat is in good condition for spawning!
- A score of 55–90 indicates that the spawning habitat is OK, but would be better with improvements.
- If you a 0 score for ANY of the attributes then spawning is UNLIKELY to occur – needs improvements.