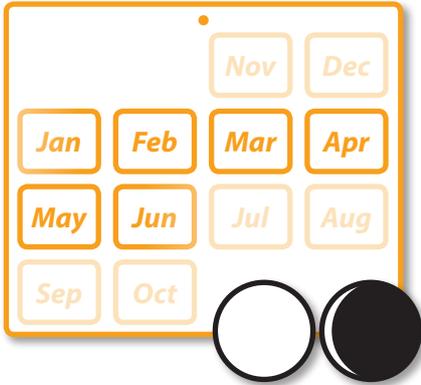


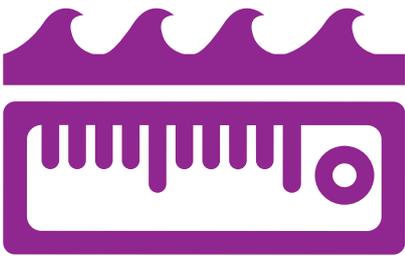
Inanga/Whitebait

Finding natural spawning sites



WHEN TO LOOK:

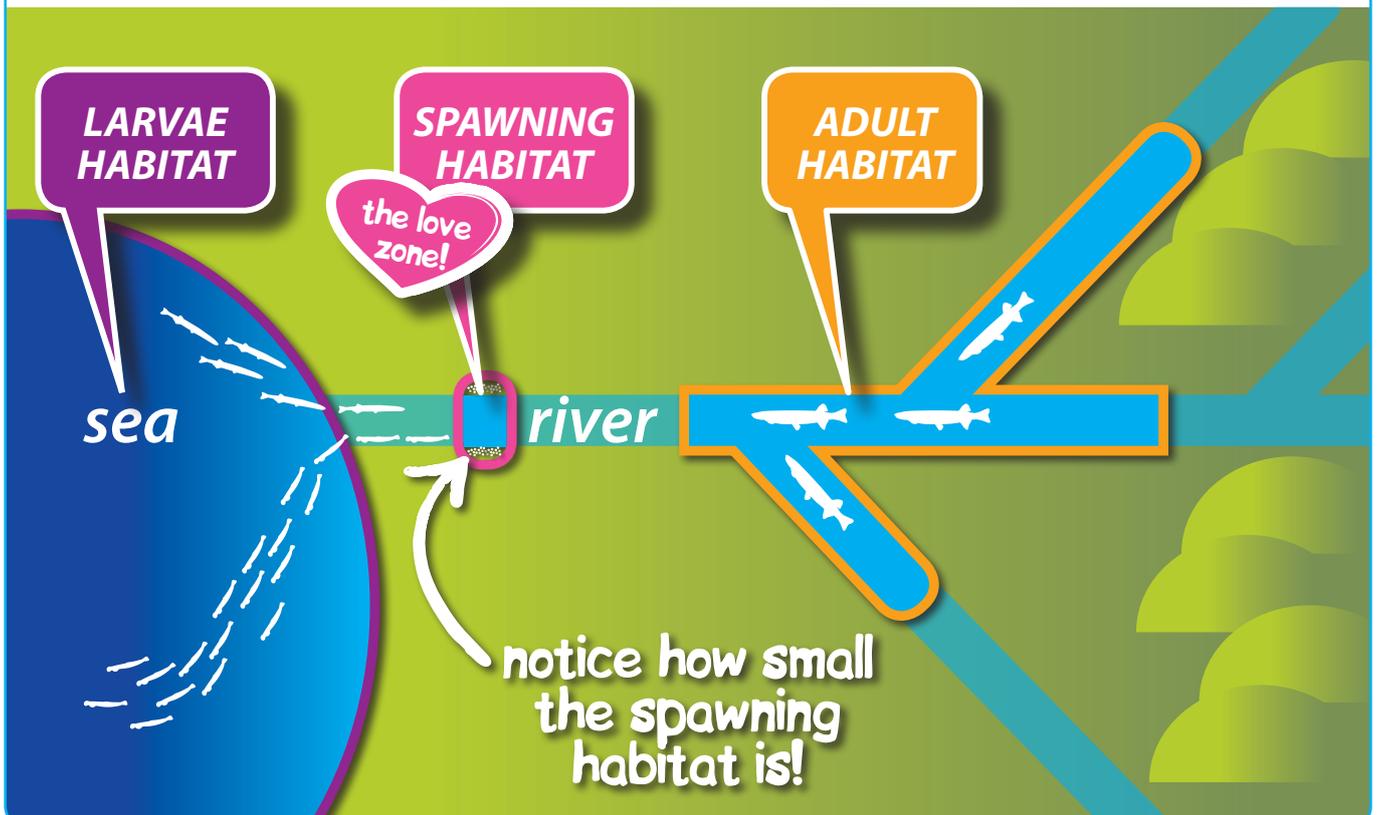
Inanga spawn mainly from late January–early June (peak levels in April). Eggs are laid over several days just after the new or full moon (sometimes both). The tides are higher than normal at these times (they're called spring tides) and spawning occurs 2–3 days after the highest spring tides. You can use a moon phase calendar and local tide tables to determine when spawning should occur. Before you start looking for eggs, it's best to visit a stream during a spring high tide to mark the high tide water level on the river banks (it's often much higher than you imagine!) – **look for eggs at low tide.**

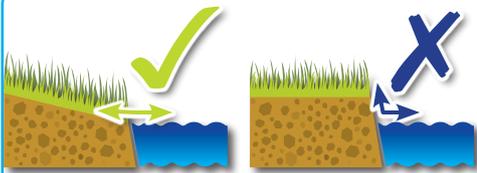


WHERE TO LOOK:

1. Distance from the sea

Inanga spawning often occurs close to the upstream limit of saltwater penetration – this is usually quite different to the limit of the tide's influence. This can be determined by testing the bottom water in the deepest part of the stream channel at high tide with a salinity meter. Be aware that the extent of saltwater penetration can vary hugely from day to day, the bigger the tide, the further upriver the saltwater will go.





2. Access to bank

Look for gentle natural slopes that the spring tide can cover.

3. Bank vegetation



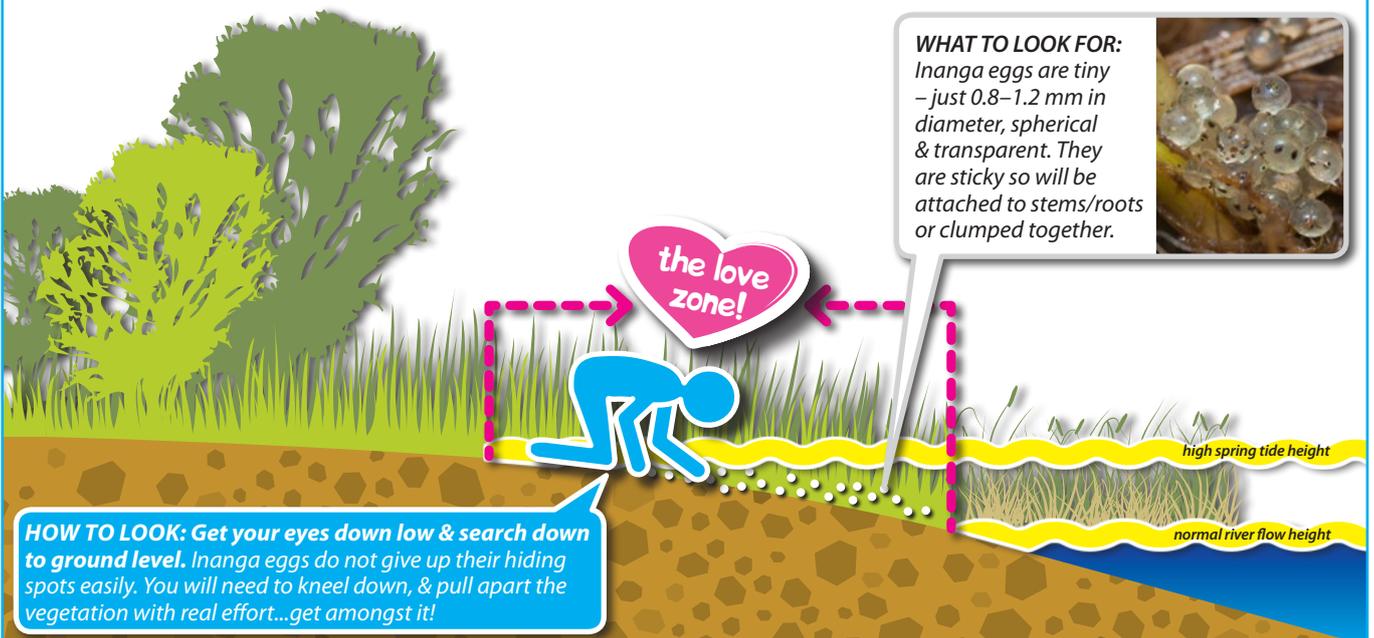
Find the upstream limit of salt-tolerant plants and search upstream of this point...Vegetation also responds to saltwater penetration – the presence of some salt-tolerant plants is an indication that the site may be too salty. Eggs are very rarely found amongst *Cotula coronopifolia* (bachelor's button), *Juncus kraussii* (sea rush), *Apodasmia similis* (jointed wire rush) or *Schoenoplectus pungens* (three-square).



Focus on the tallest, densest clumps of vegetation, these are the most likely to contain eggs...*Inanga* eggs need to stay moist so that oxygen can permeate through the outer layer of the egg and the embryo inside can breathe. Adults prefer to spawn in tall, dense vegetation that buffers temperature and humidity variations and that protects the developing eggs from ultraviolet radiation. Because of their thick aerial root mat and/or dense stems, *inanga* eggs are **commonly** found among *Schedonorus phoenix* (tall fescue), *Agrostis stolonifera* (creeping bent) or *Juncus edgariae* (Edgar's rush).



If the soil is dry or sandy you will not find *inanga* eggs...Another clue for finding *inanga* eggs is moisture. Look on the most shaded bank of the stream first, the vegetation here will be lusher and the soil beneath will be moist.



WHAT TO LOOK FOR:

Inanga eggs are tiny – just 0.8–1.2 mm in diameter, spherical & transparent. They are sticky so will be attached to stems/roots or clumped together.



HOW TO LOOK: Get your eyes down low & search down to ground level. *Inanga* eggs do not give up their hiding spots easily. You will need to kneel down, & pull apart the vegetation with real effort...get amongst it!

FURTHER READING & RESOURCES:

- Find a moon phase calendar at www.moonconnection.com
- Find local tide tables at www.linz.govt.nz/hydro
- McDowall, R. M. (1984). *The New Zealand Whitebait Book*. Wellington, Reed.
- Mitchell, C. P. and G. A. Eldon (1991). *How to locate and protect whitebait spawning grounds*. Rotorua, Freshwater Fisheries Centre
- Richardson, J. and M. J. Taylor (2002). *A guide to restoring inanga habitat*. NIWA Science and Technology Series 50: 1-29.

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