

Golden River Treasures
Charlotte Jenkins
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I wait for nightfall and in the clear, gently-flowing waters lit only by the light of the silvery moon I lay my eggs. Nearly 500,000 this season: not bad for an old fish like me and well worth the challenging journey! My only hope as they float off into the night is that they survive the perils that lie ahead. But for now, I can feed... there must be some tasty yabbies around here somewhere!

For the free-floating ('planktonic') eggs of *Macquaria ambigua*, or as we know her, golden perch or yellow belly, survival depends on the timing of spawning and the health of the river where they are released.

Luckily, a female fish could live to a ripe old age of 26, so has more time than most to have a successful breeding season. And it's no mean feat to get upstream to suitable spawning habitat and still have enough energy to spawn.

Of the 56 species of freshwater fish in NSW, the golden perch is just one of at least 40 that migrate as part of their life cycle. Golden perch can travel up to 2000 km in a single migration to reach suitable spawning habitat.

Unfortunately for golden perch and many other species, migration to suitable habitat isn't possible in some rivers. There are thousands of weirs and dams littered throughout the Murray Darling system and only about 5 % of these have fishways to assist fish make their way past the obstacle. On top of that, there are hundreds of poorly designed road crossings.



Even at this young stage, juvenile goldens would already have triumphed over many potential dangers. Image: © Gunther Schmid

These obstacles have led to the disappearance of native fish populations in many areas of otherwise good fish habitat. For example, 'natural' populations of golden perch have disappeared from the upper Murray River following the construction of Hume Dam and Yarrawonga Weir.

The obstacles aren't all physical either. Of the major dams in the Murray Darling, 9 are large enough and deep enough to cause thermal stratification (a layering of warmer, less dense water, over cooler denser layers). Because water for release downstream is drawn from fixed-level intakes, it is the lower cooler layer of water that is released. This 'cold water pollution' can be as much as 10 degrees cooler than the natural water temperature. Lower water temperatures severely affect the

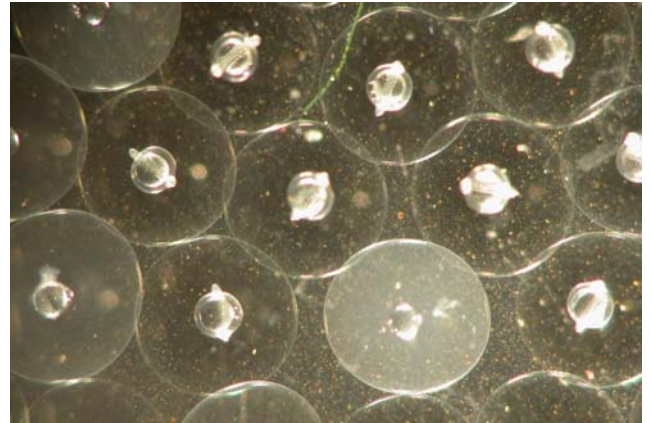
swimming performance of golden perch and over 3000 km of lowland river habitat experiences cold water pollution.

Also like many native freshwater fish, golden perch rely on seasonal cues to initiate a spawning run, so these lower temperatures and the alteration of flows have an impact on breeding. If conditions are not quite right the female golden perch may simply resorb her eggs!

And what of those eggs floating downstream? In less than 2 days they will hatch, and then what? The success of the spawning run depends on the survival of these minute fragile eggs and the equally vulnerable hatched larvae. In a good year the flood waters will provide access to habitats across the floodplains that are rich with food.

Unfortunately, many of those obstacles which inhibited the adults also affect the survival of the larvae. As many as 95 % of the drifting golden perch larvae won't survive the high water pressures at undershot weirs, which release water from the bottom of their weir pools.

With so many threats to their survival, the health of golden perch populations depends on the efforts of all those who care about protecting and restoring our native freshwater fishery. Next time you battle to reel in a beautiful golden perch, think about the epic journey it may have been on and what perils it's faced to survive. And think too about how many more golden perch there could be in our rivers if we reduced these perils!



At about 37 hours old, the 3mm to 3.5 mm fertilised golden perch eggs are ready to hatch. Image: Steve Thurstan I&I NSW