



Water notes



ADVISORY NOTES FOR LAND MANAGERS ON RIVER AND WETLAND RESTORATION

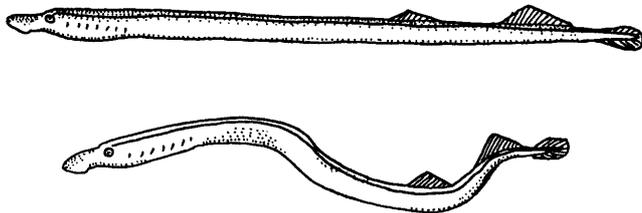


Lamprey guides

What are lampreys and where are they found?

Lampreys are primitive 'eel-like' fish, which unlike true bony fish have no jaw or paired fins. Instead of a jaw lampreys have a sucktorial disk lined with tiny teeth surrounding a mouth. Lampreys feed by sucking onto fish and sucking or rasping away blood and flesh. Fossil lampreys date back to about 280 million years ago, which is 50 million years before the appearance of dinosaurs. Today there are about 30 lamprey species ranging in size from 200 — 1000 mm, most of which spend all or at least part of their life in fresh waters (McFarland *et al.* 1979, Kershaw 1983).

The lower south west of Western Australia, between Margaret River and Denmark is home to the pouched lamprey (*Geotria australis*). The adult pouched lamprey is about 650 mm long, and marine adults are brilliant cobalt blue in colour with bright greenish lateral stripes. On entering fresh water, adults become drab brown, with males developing a large sac or pouch, which hangs down just behind the mouth. The function of the pouch is unknown. Young larval lampreys range in length from 30-80 mm, have no eyes and are dull brown or black in colour, while recently metamorphosed young adults, known as 'downstream migrants' are miniature versions of their parents (Potter *et al.* 1986).



Adult lamprey, about 600mm long.

The lamprey life cycle

The pouched lamprey spends most of its adult life at sea, re-entering rivers and embarking upon an arduous upstream migration, during winter and spring, to permanent fresh headwater creeks where it spawns and dies. Larval



Unusual sighting of a lamprey, out and about during the day in the Lefroy Brook near Pemberton. L.Pen

lampreys, spend several years filter feeding from burrows in soft sediments before metamorphosing into their adult form and moving to the ocean in winter.

The lamprey migration and overcoming obstructions

In moving upstream lampreys must negotiate rapids and climb waterfalls, and these days also dams and weirs, in order to reach their breeding habitat. Lampreys are good climbers, using their sucktorial mouths to gain a grip on wet surfaces and whipping their bodies upwards to inch their way up and over obstructions. In very wet weather, lampreys will leave the water and snake their way cross-country to get around the most challenging of obstructions.

Most of the lampreys' migratory movements occur on dark nights when water levels are rising and rain is falling. Occasionally some animals will attempt to climb waterfalls and weirs during daylight. Most lampreys spend their daylight hours hiding under rocks and logs and among fringing vegetation.



During the early stages of their migration, lampreys are susceptible to blood poisoning and internal bleeding. Many other animals die from injuries and exhaustion incurred while attempting to climb or get around the more hazardous obstructions. Sometimes lampreys get lost in wet weather by following the flow of water from roads and paddocks with the result they become stranded the next day and quickly die in the sun (Pen *et al.* 1991).

Need for lamprey guides

With an increasing number of obstructions on south west rivers and diminishing habitat due to the clearing of natural bushland, it is important to reduce the lamprey mortality rates associated with obstructions to upstream movement. This is especially necessary where dams and weirs are located below prime lamprey habitat, which is often the case in the karri forest region, and where road and paddock runoff threatens to lure lampreys into danger.

Constructing and maintaining a lamprey guide

A lamprey guide is essentially a low fence. The fence needs to be 50 cm in height and of heavy gauge 1 cm non-abrasive wire mesh supported with poles set in the ground or cemented to rock. The fence should be located in a rough horseshoe alignment with either arm on either side of the obstruction, so as to guide the lampreys around the obstruction when they leave the water on dark wet nights. The most effective location of the guide can be determined by encompassing the main exiting point, which can be determined from observations.

Within the guide the ground should have a moderate slope and be vegetated either with grass and/or the existing vegetation to reduce the chances of injury that would occur

on more abrasive surfaces such as rock or stones. Note that smooth water washed stone is not a problem for lampreys to negotiate.

Lamprey guides should be relatively cheap to erect and require only annual pre-winter maintenance to remove leaves and ticks from the mesh.

Existing lamprey guides are located about the Pemberton and Rainbow Trail Gauging Weirs on the Lefroy Brook near Pemberton.

Further reading

Available from Water and Rivers Commission

Water note WN8 *Habitat of rivers and creeks.*

Available from other sources

Kershaw, D.R. (1983) *Animal Diversity*. University Tutorial Press, UK.

McFarland, W.N. Harvy Pough, F. Cade, T.J. and Heiser, J.B. (1979) *Vertebrate Life*. Macmillan Publishing Co. Inc. New York.

Pen, L.J. Potter, I.C. and Power, G.W. (1991) *Fish and lamprey monitoring in the Lefroy/Big Brook system in south-western Western Australia*. A report to the Western Australian Water Authority. School of Biological and Environmental Sciences, Murdoch University.

Potter, I.C. Hilliard, R.W. and Neira, F.J. (1986) *The biology of Australian Lamprey*. In: DeDeckker, P. and Williams, W.D. (eds), *Limnology in Australia*. CSIRO/Dr W. Junk Publishers, Dordrecht, Netherlands.

For more information contact



WATER AND RIVERS
COMMISSION

Level 2, Hyatt Centre
3 Plain Street

East Perth Western Australia 6004

Telephone: (08) 9278 0300

Facsimile: (08) 9278 0301

or your regional office

Website: <http://www.wrc.wa.gov.au>

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Text by Dr Luke Pen. Water note project coordination by Jodie Oates and Heidi Oswald.

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For further information on any particular issue please contact the Restoration & Management Section at the Water and Rivers Commission.