

## Why are migrating male shortfinned eels (*Anguilla australis*) in Lake Ellesmere, New Zealand, getting smaller but not younger?

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Lake Ellesmere is a large coastal lake in the South Island of New Zealand which supports important commercial fisheries for both feeding and migratory shortfinned eels *Anguilla australis*. Over the past 50 years, the sex distribution of migratory eels in the lake has changed from a dominance by females to a dominance by males. Age and size data of males have been collected intermittently since 1974. During this time, the mean age has remained relatively constant while the average length has declined by almost 20%. Despite this reduction, length distributions are less variable than weight, condition, or growth rate distributions, and length is considered to be the primary factor associated with the onset of migration. The reduction in average size does not appear to be a result of selective harvest of larger individuals, but must reflect changing environmental conditions in the lake itself - such conditions could include loss of macrophytes, and a reduction in the proportion of larger eels of both species with resultant proliferation of the small benthic bully *Gobiomorphus cotidianus*. The suggested management strategy is to maximise harvest of migratory male eels and thus reduce the capture of females which are large enough to prey on bullies.

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