

Underwater, out of sight: lessons from threatened freshwater fish translocations in Australia

*Mark Lintermans, Jarod P. Lyon, Michael P. Hammer,
Iain Ellis and Brendan C. Ebner*

Summary

Fish translocations are fundamentally different to those of other vertebrate groups, with orders of magnitude more individuals usually released, and these individuals usually having high subsequent mortality. Translocation programs for Australian freshwater fish have changed considerably in the last 30+ years, moving from wild-to-wild translocations to hatchery stockings for recreational fisheries. Hatchery stocking and wild-to-wild translocations are now also used for conservation purposes. Translocations are among the four most-common management interventions employed for threatened Australian freshwater fish, with the frequency of wild-to-wild translocations, stockings and rescues increasing significantly during the recent Millennium Drought (1997–2010). We document 99 translocations of Australian freshwater fish conducted for conservation purposes since the late 1980s. These were all reintroductions (releases to sites formerly occupied by the species) or reinforcements of existing populations, except for one conservation introduction. Excluding cases where it is too early to assess the outcome, or where remnant populations were present when the reintroduction occurred, 38% of the translocations claim full or partial success. However, for 16% the outcome is unknown, raising concerns about the adequacy of monitoring. Monitoring programs associated with fish translocations are often short-term, under-resourced and, for long-lived fishes, monitoring often only encompasses the first milestone of success (survival for some period after release), with subsequent milestones (breeding and establishment) left unmeasured. Case studies review new insights into fish translocation such as: optimal stocking strategies; the survivorship and dispersal of on-grown individuals (i.e. hatchery-reared beyond the juvenile stage); the use of captive maintenance and subsequent release; and the use of artificial habitats ('natural hatcheries') to increase production numbers. Future freshwater fish translocations require increased levels of investment and will likely benefit from combined approaches of stocking and wild-to-wild translocation, along with consideration of further conservation introductions.