3.5

FISH: IMPACTS OF FERAL HORSES—STOCKY GALAXIAS

THE THREAT FROM FERAL HORSES TO A CRITICALLY ENDANGERED FISH

Hugh Allen and Associate Professor Mark Lintermans

Institute for Applied Ecology, University of Canberra, Canberra

Stocky Galaxias (*Galaxias tantangara*) is a small native fish found in the headwaters of the Tantangara Creek catchment in Kosciuszko National Park. The species is one of 15 recently described taxa, being formerly included in the Mountain Galaxias complex (Raadik 2014). Stocky Galaxias is listed as critically endangered in NSW (NSW FSC 2016) and nationally by the Australian Society for Fish Biology (Lintermans 2016). Only a single population is known; located above a natural waterfall in the headwaters of the catchment. Now found in about 3 km of a small permanent stream (average about 1 m wide and 10 cm deep), it is predicted to have been formerly much more widely distributed throughout the Tantangara Creek and possibly the upper Murrumbidgee River catchment (Raadik 2014; NSW FSC 2016). The current restricted distribution of Stocky Galaxias is thought to result from the impacts of predatory trout (NSW FSC 2016).

Wild horses are abundant in the Tantangara area and establish/use well-worn trails throughout the Tantangara Creek catchment. These trails commonly cross Tantangara Creek where Stocky Galaxias is found. At such crossings, bankside vegetation is largely absent, bank structure is damaged, the stream is wide and shallow, and fine gravels and silt have filled an otherwise boulder- and cobble-dominated substrate. The population density of horses in Northern Kosciuszko (including Tantangara Creek) is two to three times the density recorded elsewhere in the Australian Alps (Cairns and Robertson 2015).

Observations downstream of horse crossings show accumulations of fine sediment, almost certainly mobilised by horse damage (pugging, trampling, bank slumping, runoff from trails). These sediment accumulations are generally less severe or absent in areas further downstream, or immediately upstream of crossings. The extremely small current distribution of Stocky Galaxias magnifies the importance of instream and riparian habitat degradation from feral horses. The impacts of horses on aquatic habitats in the High Country in Australia have been documented for nearly 30 years (Dyring 1990; Roberston et al. 2015). However, this damage has not been previously considered from a fish perspective.

Like many *Galaxias* species, rocky substrates and clean spaces between stones appear important for Stocky Galaxias spawning (Cowden 1988; Stoessel et al. 2015). Sedimentation reduces available spawning habitat and can smother and kill fish eggs. The long incubation time of Stocky Galaxias eggs means the species is particularly vulnerable to sedimentation. Unlike other Australian upland fishes, such as blackfish *Gadopsis* sp., which exhibit parental care by fanning eggs to remove sediment and promote oxygenation, *Galaxias* species do not have parental care. Direct damage by horse trampling could also impact egg and larvae survival during this time.

Tantangara Creek at a horse crossing.

Note the narrowness of the stream and bankside vegetation in the top left corner and the fine silt and gravel throughout the stream.

Source: Mark Lintermans.

Preliminary ecological research into Stocky Galaxias indicates that it has a small home range, with most individuals found within a 5 m total linear range. Fish generally shelter within the interstitial space between large substrate particles, such as cobbles and boulders, and are not often found in areas with fine particles such as silt and gravel. Localised damage or loss of stream habitat means the entire home range of several fish may be affected.

Feral horses are impacting stream and riparian habitats throughout the entire remaining range of Stocky Galaxias. Although there are other large feral herbivores in the catchment (deer), their observed abundance around streams is an order of magnitude lower than horses, with the overwhelming abundance of signs at stream crossings and on trails from horses. Quantified measures of horse damage to stream and riparian habitats in Tantangara Creek are urgently required.

References

Cairns, S. and Robertson, G. (2015) *2014 Survey of Feral Horses (*Equus ferus caballus*) in the Australian Alps*. Australian Alps Liaison Committee, Canberra.

Cowden, K. (1988) *Aspects of Biology of the Mountain Galaxiid,* Galaxias olidus *Gunther (Pisces: Galaxiidae) in Pierces Creek ACT.* BSc (Hons) thesis, The Australian National University, Canberra.

Dyring, J. (1990) *The Impact of Feral Horses (*Equus caballus*) on Sub-alpine and Montane Environments in Australia.* MAppSc thesis, University of Canberra, Canberra.

Lintermans, M. (2016) Conservation Status of Australian Fishes – 2016. *Australian Society for Fish Biology Newsletter* 46(2): 142–144.

NSW FSC (NSW Fisheries Scientific Committee) (2016) *Final Determination: Galaxias tantangara – Stocky Galaxias as a Critically Endangered Species*. NSW Fisheries Scientific Committee, Sydney.

Raadik, T. A. (2014) Fifteen from One: A Revision of the *Galaxias olidus* Günther, 1866 Complex (Teleostei, Galaxiidae) in South-eastern Australia Recognises Three Previously Described Taxa and Describes 12 New Species. *Zootaxa* 3898: 1–198.

Robertson, G., Wright, J., Brown, D., Yuen, K. and Tongway, D. (2015) *An Assessment of Feral Horse Impacts on Treeless Drainage Lines in the Australian Alps*. Australian Alps Liaison Committee, Canberra.

Stoessel, D. J., Raadik, T. A. and Ayres, R. M. (2015) Spawning of Threatened Barred Galaxias, *Galaxias fuscus* (Teleostei: Galaxiidae). *Proceedings of the Linnean Society of New South Wales* 137: 1–6.