

Implementation of Recovery Plans – Spotted tree frog and Barred galaxias.

Author¹ Steve Smith

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Abstract: The nationally threatened species, Spotted tree frog *Litoria spenceri* (STF) and Barred Galaxias *Galaxias fuscus* (BG) have a restricted range in North East Victoria. Barred Galaxias is endemic to the Goulburn River system. It is restricted to 20 small, trout free headwater tributaries. Spotted tree frog occurs in upper middle reaches of 7 sub-catchments in the Goulburn system at approximately 400m to 800m altitude. Both species are nationally listed threatened species. Spotted tree frog has a published National Recovery Plan. Barred Galaxias has a Flora and Fauna Guarantee Action Statement. A Spotted tree frog Recovery Team has been operating since the early 1990's. Barred Galaxias has not had a formal operating Recovery Team but those directly involved in research and management regularly communicate and discuss research and management issues. This paper briefly describes ongoing survey, monitoring and research associated with biology/ecology, threats and management since the early 1990's. Changes in direction during that time are noted.

Project Aim:

To implement various survey, monitoring, research and management components of Recovery Plans for each species.

Methods and results

STF SURVEY

Extensive surveys for Spotted tree frog were conducted by Graeme Gillespie and others during the early 1990's. Visual searches, within streams are conducted by observing daylight basking on rocks and vegetation or by lifting loose materials in or close to water. Frogs are detected at night using a spotlight. Most streams within the range of occurrence have been surveyed and there has been few additional populations detected since the initial surveys.

STF MONITORING

Broad scale monitoring of known populations has been conducted annually since 1994. One km stream transects are traversed by 2 observers over a 4 to 5hr period and details recorded on all frogs detected. An analysis of 10 years of data has indicated that the data does not have sufficient power to detect population change at a site however it can detect overall population shifts over time. Emphasis has shifted to periodic monitoring and establishing the points of stream limits of populations.

Demographic monitoring using mark and recapture techniques has been conducted annually on the Taponga River and Still Creek populations since 1994. Until 2007 the Taponga population was stable however a population crash has occurred at the monitoring site in 2007. A mark-recapture transect has been established near the upstream limits of this population. Population crash is not evident at this site. Still Creek population has been declining from a low base throughout the 1990,s and 2000,s.

STF RESEARCH

An extensive set of experiments to test the effects of fish predation on STF tadpoles was conducted by Graeme Gillespie during the 1990's. Tadpoles were exposed to both introduced and native fish in controlled laboratory and field experiments. Results have been published. The evidence indicates that trout predate heavily on tadpoles and severely limit recruitment. All Victorian populations occur in streams where trout are present however a population at Bogong Creek in NSW, which trout can rarely access, has population densities of STF in excess of ten times those recorded in Victorian streams. The Bogong Creek population has now crashed with disease a possible cause.

¹Department of Sustainability and Environment, 46 Aitken St Alexandra, Victoria.

Captive breeding programs have had to deal with a number of challenges with respect to survival, health and breeding. Experimentation and adaptive learning have contributed to learning and successful breeding and release as part of the conservation program.

Lethal effects of Chytrid fungus occur in both wild and captive populations of STF. Research is ongoing. Wild populations are being sampled for chytrid infection and experimentation in captive populations resulted in methods for treatment. There are a number of parties conducting research into chytrid effects on other species and results are likely to be instructive for STF applications.

STF MANAGEMENT

Survey results have been used to designate stream reaches where forestry protection and management zones operate. These have been published in the Central Highlands Forest Management Plan. Increased prescriptions related to road construction and maintenance to reduce sediment input to streams have been adopted.

Captive management has been implemented for the Bogong Creek population in N.S.W. This population crashed in 1996 with Chytrid infection possibly implicated. A remaining animal was bred with others from a genetically similar site and the progeny have been released back to Bogong Creek. Initial monitoring indicates that a high percentage of released animals have survived the first year. Captive management and research has been conducted by the Amphibian Research Centre (ARC). Recently a captive population has been established at Healesville Sanctuary using Taponga River founder animals. A captive management program is currently in place for the Buffalo Creek population.

In 2001 a fish barrier was constructed on White Creek downstream of the White Creek/Still creek population. A plan to remove all introduced fish, principally trout, from above the barrier has not been possible due to a government ban on all use of the piscicide, "rotenone". Without a feasible or realistically priced method to remove fish it cannot be ascertained if STF numbers will increase in the absence of trout.

BG SURVEY

Surveys have been regularly conducted in streams across the Goulburn River catchment using electro-fishing techniques. BG can also be detected visually, particularly if there is sunlight illuminating pools. One new population has been detected in the last 5 years, at Sunday Creek.

BG MONITORING

Monitoring is conducted using electro-fishing. Population estimates involve netting stream sections and using fish-down sampling. Fish are measured and weighed before release. Both artificial and natural barriers are monitored to ensure trout are not accessing BG populations. At a small number of sites where trout do gain access they are removed by electro-fishing before they can spawn. Incursions are believed to be the result of human interference.

BG RESEARCH

A range of research into the biology of BG has been completed by Tarmo Raadik including knowledge of genetics, spawning and rates of recolonisation after removal of trout. BG took ten years to re-colonise a 2 km section of stream made trout free in 1995. In 1995 all fish were removed to points between the downstream extent of BG populations to artificial barriers or the next "trout proof" waterfall. This was done using the piscicide "rotenone" under permit and scrutinized by the EPA.

Captive management has generally been viewed as likely to be difficult and expensive due to the cold water requirements of the species. Until recently a captive management component to the conservation program was not planned. In 2006/07 extensive bushfires impacted on a number of populations in the eastern half of BG distribution. At the same time severe drought resulted in drying of 2 streams to the west. BG were removed to captivity and held in cool room aquaria at Arthur Rylah Institute. Fish from fire affected streams have now been released and there is evidence that fish that remained in stream have survived and successfully spawned. Mortality rates of fish in captivity were generally low and despite the expense considerable knowledge has

¹Department of Sustainability and Environment, 46 Aitken St Alexandra, Victoria.

been gained should further captive management be required. Fish from drought affected streams remain in captivity. Surveys of Leary's Creek near Marysville indicate that a small number of fish survived the drought in spring fed areas while it is likely that no fish survived in Sunday Creek. A project is underway to construct small artificial drought refugia in Leary's creek. BG spawned while in captivity although this was not detected until after fish were released. Eggs didn't hatch but there is now some possibility of being able to breed this species in captivity.

BG MANAGEMENT

In the year prior to the 2006/07 drought a barrier was constructed on Leary's Creek to replace the existing barrier which was, fortuitously, a long time road culvert blockage.

All streams containing BG have minimum forestry buffers of 30m c.f. 20m Code of Forest practice buffers. The Central Highlands Forest Management Plan commits to reducing roads in catchments containing BG. This approach was particularly successful in the upper Rubicon River which contains the largest population. A logging access road lead to the discovery of BG however the road was gated during harvesting to reduce the risk of people introducing trout. The road was originally planned as a permanent, through, road but once timber harvesting was completed the road was closed, revegetated and the bridge decommissioned.

Further Reading

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