

Recreational fishers supporting the recovery of the Critically Endangered spotted tree frog

Threatened Species Recovery Hub Project 1.4.1

Key messages

- Spotted tree frogs have suffered major declines, are now Critically Endangered, and will become extinct unless action is taken.
- Non-native fish and chytrid fungus disease are the biggest threats to spotted tree frog populations.
- Spotted tree frog populations cannot survive both threats together. It is not currently possible to directly manage chytrid fungus.
- Reducing non-native fish at important spotted tree frog sites could help the frogs survive.
- We are undertaking a five-year management trial near Lake Eildon, Victoria, at a remote stream that has been assessed by anglers as difficult to access and of low recreational fishing value. The stream is also considered a vital site for the recovery of the spotted tree frog.
- During the trial we will use mechanical (angling and electrofishing) removal methods to reduce non-native fish from a site above an existing concrete fish barrier and where possible relocate them to a site below the barrier.
- We will then monitor and evaluate changes to the frog population at the sites above and below the barrier.
- The trial will greatly increase our understanding of the impacts of non-native fish and chytrid fungus on spotted tree frogs. This knowledge will improve future management to conserve the spotted tree frog.
- The trial is expected to result in an increased spotted tree frog population at the site and help prevent this species' extinction.

Understanding the problem

The spotted tree frog historically occurred in freshwater streams in north-eastern Victoria and southern New South Wales. But the species has disappeared from 50% of its former sites, is rare at all remaining sites and now only eight of the original 14 populations persist in the wild. This Critically Endangered species is expected to become extinct without intervention.

Non-native fish and chytrid fungus are the two key threats to the frog's persistence.

- **Non-native fish** (brown trout, rainbow trout, European carp and redfin perch) eat spotted tree frog tadpoles. Native fish (blackfish) don't eat the tadpoles.
- **Chytrid fungus** causes a disease called chytridiomycosis that kills adult frogs.

Under some conditions, the populations of spotted tree frogs may be able to cope with one of these threats, but they can't cope when both threats are present.

Spotted tree frog on a burnt log. Image: Matt West



Understanding the problem (continued)

Some lower elevation sites with warmer temperatures, which are less optimal for survival of chytrid and where frogs can mature earlier and produce more eggs, may be better for the frog's survival. The site near Lake Eildon has these characteristics.

However, non-native predatory fish are present at the site, and, as these fish eat the spotted tree frog tadpoles, they are preventing the frog population from making up the numbers of adult frogs that are lost to disease caused by chytrid.

Other threats

Other threats facing the species include weed invasion, habitat loss or degradation and sedimentation of streams, which poses risks to the survival, growth and development of frogs, tadpoles and eggs.

Bushfires can kill adult and juvenile frogs, and the associated ash and sediment that can be washed into streams by heavy rain, can prevent eggs and tadpoles from surviving to become adult frogs.

Almost half of the sites used by spotted tree frog were affected by the 2019–20 bushfires.

As the remaining populations of the spotted tree frogs are very small, even single catastrophic events like a big fire could be enough to wipe out a population. Increasing the number of frogs in populations will give them more resilience to future fire events.



Electrofishing surveys. Image: Matt West

Who is involved?

A Committee assisting the Spotted Tree Frog Recovery Team was established in 2017. It currently consists of representatives from:

- Arthur Rylah Institute for Environmental Research
- Australian Trout Foundation
- Conservation Volunteers Australia
- Goulburn Broken Catchment Management Authority
- Murrindindi Shire Council
- Native Fish Australia (Victoria)
- Parks Victoria
- Taungurung Land and Water Council
- The University of Melbourne
- Victorian Fisheries Authority
- Victorian Department of Environment, Land, Water and Planning
- Victorian Recreational Fishing Peak Body
- Zoos Victoria



Brown trout. Image: Matt West

What are we doing

Reducing non-native fish is currently the most feasible option to help the frog to survive in the wild, as it is not yet possible to eliminate chytrid from sites. Removing non-native fish will lead to an increase in the numbers of tadpoles that can survive to adulthood.

We have chosen the spotted tree frog site at a stream near Lake Eildon within Taungurung Country in Victoria for a project that involves the removal of non-native fish.

Reasons that make the stream a good choice include:

- There is an existing concrete fish barrier installed below the site, so if fish are removed, they cannot easily return.
- The site is difficult to access and has low value for recreational fishing, as assessed by representatives of leading recreational fishing groups.

- It is a lower elevation site with warmer temperatures, which may help reduce the survival of chytrid and its toll on the frogs.
- Researchers already have good data about the spotted tree frog populations above and below the barrier, so it will be easier to figure out how those populations respond to the removal of non-native trout.

The non-native fish population will be reduced and will involve recreational fishers and electrofishing teams catching the fish and where feasible relocating them to areas below the fish barrier.

We have put in place a management and monitoring plan to look at how the populations of the spotted tree frogs above and below the fish barrier change in response to these actions over five years (2021 to 2026).

About chytrid

Chytrid fungus is found at the sites of all remaining spotted tree frog populations.

The fungus and the disease it causes originated in south-east Asia, and have spread around the world. It likely arrived in Australia in the 1970s.

Globally, chytrid has affected 700 species of amphibian, with at least 500 of those suffering declines as a consequence. How and why some species are more susceptible to chytrid is not yet understood.

Chytrid has a free-swimming zoospore life stage that is microscopic and can persist in the environment. Not all frog species are equally affected and species that are not killed can act as carriers of the disease.

Deceased spotted tree frog. Image: Matt West





The management plan and the recreational fishing community

Brown and rainbow trout are highly valued by recreational fishing groups. They are the inland/freshwater non-native fish most widely targeted by anglers in Victoria, and there is strong community support to protect and enhance recreational fishing opportunities for them.

When the fish barrier near Lake Eildon was first installed in the early 2000s, options for chemical fish removal were proposed, but opposed by the community. The trial did not go ahead, and no fish were removed. This time, the key representatives from Recreational Fishing groups have agreed to use angling and electrofishing as the removal methods, especially as these mechanical removal options

allow live captured fish to be relocated to areas below the fish barrier.

A management plan has been developed to trial the reduction of non-native fish.

The objective of the management plan is “to evaluate the influence of non-native fish on two spotted tree frog populations near Lake Eildon by reducing the density of non-native fish at one site above a fish barrier and monitoring the change in the juvenile and adult frog population size at both sites over a five-year period between 2021 and 2026.”

This objective is a key management action for spotted tree frog recovery and is designed to disentangle the roll of chytrid

infection and non-native fish in the decline of spotted tree frogs. Importantly, if successful, this project will help to increase the resilience of the spotted tree frog population at the site.

The support and active participation of the recreational fishing community is key to the success of the project, and to the long-term survival of the Critically Endangered spotted tree frog.

Anglers may be able to participate through special fishing days at the site, or through helping with the removal of fish during electrofishing operations. Please contact the Australian Trout Foundation or Native Fish Australia (Vic) or the spotted tree frog research team for further information.



Rainbow trout. Image: Matt West

More information

We encourage your feedback.

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