

# THE GHOST FROG OF LONGMORE



MTO | group

FORESTRY EXPLAINED: OUR CONSERVATION LEGACY



# Hewitts Ghost Frog

## The granddaddy of the amphibian world!

They split from their closest ancestors 160 million years ago when the world was dominated by dinosaurs, 10 million years before the first birds would take to the sky, ghost frogs are one of this planets oldest inhabitants.

Perfectly adapted for mountain life, ghost frogs and their tadpoles have physical adaptations that enable them to take on the powerful currents of the rocky mountain streams. Strong legs, flattened bodies, sticky toe disks and in the case of tadpoles modified mouth parts that form a super strong suction cup, all allow them to cling onto the rocks and navigate fast flowing water with ease.

Active at dawn, dusk and after dark, it is at night when the tadpoles use their mouth parts to perform gravity defying feats as they edge up moist vertical surfaces to avoid getting washed away.



Sadly, as with most species that have evolved to such an extent to suit their surroundings there is a price to pay – an often limited distribution. Hewitts Ghost Frog (*Heleophryne hewitti*) (HGF) are no different. Until 2009 these frogs were found in just four perennial rivers, the Geelhoutboom, Martins, Klein and Diepkloof, that weave through the Elandsberg Mountain Range in the Eastern Cape. The discovery of a fifth limited population in the Cockscomb Mountains has seen their IUCN status drop from Critically Endangered to Endangered, but they are far from out of the woods.

It's their need for permanent fast flowing water with rocky river beds for breeding that dramatically limits the HGF distribution. Although their terrestrial life might limit them too, but very little is known about their non-breeding behaviours.

One of the biggest threats the frogs face is the habitat loss they experienced before they were ever discovered (first found in 1988). The conversion of the natural Mediterranean-type shrub vegetation and fynbos heathland to plantations by a government job creation scheme in the 1920's has meant only small remnants of suitable habitat is now found along all four rivers.

While there is no baseline data to assess the impact this conversion has had, the current forestry land managers, MTO Forestry, have committed to minimise any future impacts by devising a management plan that will ensure the HGF is always considered when taking any management decisions relating to the plantations neighbouring the frog's home.

# SUPER AMPHIBIANS

When it comes to environmental indicators, few species are more sensitive to change than amphibians. Their porous skin and dependence on both aquatic and terrestrial habitats might make them vulnerable to even the smallest change but it also places them firmly on top of the ecological indicator list. As a result, amphibians have been helping conservationists spot early warning signs and save our planet one stream at a time!



# Assessing the risk

Since 1999, MTO have funded several studies attempting to assess the population size and distribution of the HGF along the four river systems. Their findings have uncovered a number of potential threats faced by the HGF, as well as highlighted several solutions.

## EXTREME CONDITIONS

On years where no extreme weather conditions were experienced HGF tadpoles were found in relatively high numbers in what was deemed to be stable populations. This changed dramatically for years where disastrous natural events occurred, with tadpole survival rates dropping significantly in years where heavy flooding or drought was recorded, as well as years where fire devastated the plantations surrounding the river and led to heavy surface run-off, erosion and ultimately the sedimentation of the river.

## SILT IN THE SYSTEM

HGF are dependant on running water making them hugely vulnerable to any action, natural or man-made, that lowers the water level or decreases the water quality. Erosion that increases the river's silt load is therefore a major threat. Harvesting the plantations neighbouring the rivers, roads that run alongside or cross the rivers and even the removal of alien species along the river banks all have the potential to increase the amount of sediment entering the river system and thus negatively effecting HGF.

Photo Credit: K. Kirkman



# Current status

A key objective of the most current study, still being conducted, is observing how the present HGF population in the Geelhoutboom river compares with the figures recorded in 2009. The first year's data shows a huge increase in tadpole numbers, but also a deviation of abundance between the four sites monitored. A surprise result of the study was a reduction in the average tadpole body length, specialists are being contacted to identify potential reasons for this.

## PLAN OF ACTION

Through developing the HGF management plan MTO have been able to identify:

- 1: Areas where more research is needed to better understand the population dynamics and threats faced by HGF.
- 2: Areas where plantation management can be altered and adapted in order to significantly reduce potential threats.



## FUTURE RESEARCH

While the initial study in 2000 focused on all four river systems, subsequent studies have concentrated their efforts predominantly on the Geelhoutboom river. Surveys of all four river systems are required for accurate abundance and distribution figures to base management decisions on.

In order to do this:

- 1: Maps identifying the 2000 historical distribution of HGF will be digitised and converted into GIS format with GPS positions of populations accurately recorded.
- 2: All four river systems will be resurveyed for HGF together with a survey of habitat condition and weed status.
- 3: Hopefully this data will uncover the key habitat sites (breeding sections, areas of high population density), which can then be specially managed to reduce human influence.



# Adapting the way plantations are managed

MTO has committed to managing areas currently identified as key HGF sites with the object of mitigating specific threats to HGF populations. This involves adapting certain plantation management processes in order to reduce the impact they might have on HGF populations along these stretches of river. These will include:

- **SCHEDULING HARVESTING COMPARTMENTS**
- **THE CONTROL OF INVASIVE SPECIES**
- **THE USE OF CHEMICALS**
- **ROAD NETWORKS**





# Harvesting compartments

Harvesting has the potential to negatively impact the HGF by increasing the erosion risk, both in the compartment itself and on the road network servicing it. Chemical use during silviculture that follows the harvesting of a compartment may also have a negative effect.

As a result the following must be taken into account when harvesting compartments adjacent to the four river systems:

- Management activities in and around riparian (river bank) zones during September to March (breeding season) must be kept to a minimum.
- Harvesting should be coordinated so that only one of the four river systems is effected at any one time. With 2-3 year intervals between harvesting adjoining compartments on any one river.
- A recommended 25m buffer zone should be added on each river bank and chemical activities associated with silviculture must not impact this.
- All contractors should be made aware of the HGF presence.





# Weed management

The removal of exotic plants from the riparian zones is essential to reduce the potential threat and river debris risk the plants pose. However, straight removal will increase the risk of erosion and bank collapse, so this has to be done systematically and in conjunction with re-growth of indigenous vegetation over time.

Thus the following management steps were identified and will be incorporated into any future weed management plans:

- Management activities in and around riparian (river bank) zones during September to March (breeding season) must be kept to a minimum;
- Clearing of riparian areas must only be done in areas where no harvesting will occur in the adjoining plantation for the following 3 years;
- Weed management follow ups are critical after removal;
- Where possible seedlings should be pulled by hand. For acacia slashing should only be used in conjunction with a cut stump herbicide treatment.

A review of the current management schedule has also been set to ensure it fits these parameters.





# Chemical use in compartments

Amphibians in general are very sensitive to chemicals use, which also has the potential to alter the water quality (as a result of eutrophication) in a variety of ways.

To minimise the risk MTO have adopted the following considerations:

- No chemical control should occur in the riparian buffer unless absolutely essential and then only frog friendly chemicals;
- No blanket spraying of any compartments adjoining the four rivers;
- Hand pulling should be the preferred method of weed eradication, with only approved Australian Pests and Veterinary Medicines Authority (APVMA) Frog Friendly chemicals being the preferred chemical alternative in cases where hand pulling is not an option.

# Road management

Due to tadpoles being particularly vulnerable to high siltation loads, bank disturbance from existing and future road networks, drainage and river crossings has to be minimised.

To achieve this MTO is implementing the following steps:

- No new roads and especially river crossings will be constructed on any HGF rivers and the network of roads on these rivers will be assessed with the aim of reducing the number of river crossings further;
- Road network upgrades will be scheduled before harvesting next to these rivers to minimise impact of the heavy use of these networks during harvesting;
- Silt traps will be deployed during harvesting and the impact of road use during harvesting will be monitored



# Awareness is key

When it comes to saving a species, knowing the numbers, threats and the actions required to conserve it is only half the battle. Conservation success is only guaranteed if all those who work and enter the area are also on board. This is where communication becomes critical.

Posters, team talks, work instructions are being used by MTO to ensure staff, contractors and visitors understand the sensitivity of the species and importance of conserving it.

Ultimately it is about instilling a stewardship-ethic across the board, ensuring the HGF becomes part of MTO's conservation legacy.







Photo Credit: L du Preez



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## FINAL THOUGHT

"MTO remains committed to finding ways to minimise our impacts on the environment. We continue to monitor our actions and will as far as possible adapt our practices where able to improve the habitat of this keystone species."

Lawrence Polkinghorne  
MTO Group CEO

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