

ORANA WILDLIFE TRUST

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Orana Wildlife Park Funding Application to Amphibian Ark Seed Grant

- 1. Project Title** Maud Island Frog Habitat
- 2. Organisation** Orana Wildlife Park, Christchurch, New Zealand
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- 3. Funds Sought** US\$3,563.50 (NZ\$5,000.00)

4. Executive Summary

Orana Wildlife Park (Christchurch) – New Zealand's only open range zoo, will develop a state-of-the-art habitat for the 'Nationally Endangered' New Zealand Maud Island Frog (*Leiopelma pakeka*) in 2010. Housing these frogs will support the aims of the Department of Conservation Native Frog Recovery Plan through conservation advocacy, provision of an insurance population, research, refining husbandry techniques for the species and ultimately breeding for release to the wild.

The habitat will be a nocturnal display providing an insurance population of Maud Island Frogs, allow refinement of techniques to enable captive breeding of the species, and ultimately allow breed-for-release programmes to supplement surviving colonies *in-situ*. The refinement of these techniques is also essential to the Department of Conservation's aim of securing and breeding Hamilton's Frog (*Leiopelma hamiltonii*) in captivity and could potentially lead to breed-for-release of this species.

Extensive interpretation will support key messages that will outline the importance of habitat preservation, the need for controlling introduced predators and demonstrate the public's role in assisting conservation. Through holding the species, Orana will obtain more information about the management of Maud Island Frogs, helping to manage this and other species (particularly Hamilton's Frog) in captivity and in their natural habitats.

The Amphibian Ark funds are instrumental to enabling us to construct a facility that provides long term security of Maud Island Frog and potentially Hamilton's Frog.

5. Introduction

Orana Wildlife Park is New Zealand's only open range zoo. The Park, located in Christchurch, is owned and operated by Orana Wildlife Trust, a registered charity. Orana is a full institutional member of Zoo and Aquarium Association Australasia (ZAA, formerly ARAZPA). The Park is the only major New Zealand zoo that is not owned and operated by local council and staff must separately fundraise in full for all capital developments.

New Zealand's four native frog species belong to the genus *Leiopelma*, an ancient and primitive group of frogs. The frogs are small, nocturnal and well camouflaged. Three introduced frog species are also found in New Zealand. Maud Island Frogs are endemic to New Zealand and number less than 30,000. The species is restricted to a few island locations making the frogs especially vulnerable to habitat destruction and predation. The Department of Conservation (DoC) lists Maud Island Frogs as 'Nationally Endangered' and the World Conservation Union classify them as 'Vulnerable'. Furthermore, the Maud Island Frog is rated 58 on the most Evolutionary Distinct and Globally Endangered (EDGE) amphibians in the world! Additionally, the Maud Island Frog appears analogous to Hamilton's Frog, which ranks number 17 on the EDGE list, is listed as "Endangered" by the IUCN and 'Nationally Critical' by DoC.

Orana Wildlife Trust was an active participant in the Year of the Frog campaign and was particularly influential within New Zealand as staff developed and distributed a full information kit to assist other ZAA NZ Branch members, encouraging them to participate in the campaign. The Trust has helped to raise awareness on, and funds for, the amphibian conservation crisis and now aims to make a long term contribution to amphibian conservation by holding an insurance population of native frogs and conducting research to refine husbandry techniques to assist Maud Island Frogs (*Leiopelma pakeka*) and the analogous Hamiltons Frog (*L.hamiltonii*).

Orana's project will be consistent with DoC's Native Frog Recovery Plan. The Plan states that one of the preferred options for recovery of frog species includes the creation of captive breeding populations and reintroduction of captive bred frogs to the wild. One of the Management Goals is that all native frog species are secured in captivity by 2014. In particular the Plan states that a captive population of Maud Island Frogs for breeding and refinement of husbandry techniques should be established by 2011. The Plan also states that the creation of healthy captive populations is an essential tool for the long term conservation of native frogs. Orana's project could also help Hamilton's Frog species as the Recovery Plan mentions that a captive population of Hamilton's Frog should only be established if a high survival and successful breeding rate of captive Maud Island Frogs has been achieved.

Orana's habitat will be a nocturnal research and breeding centre and will give visitors a rare chance to see a native frog. This project will be the only one of its type in the South Island of New Zealand. It will be crucially important to preserving these precious native animals, whilst assisting raising awareness of a lesser known endangered native species.

The specific aims and objectives of the project are:

- Develop and refine husbandry techniques to breed and rear Maud Island Frogs from eggs through to adults. This has not been achieved in a captive setting.
- Through breeding Maud Island Frogs, Orana will be able to offer its expertise to assist in the conservation of Hamilton's Frog in captivity.
- Release Orana-bred Maud Island Frogs to the wild (as part of the breeding programme).
- Support research to directly assist in-situ work.
- Raise awareness of native frogs.
- Foster attitudes that reflect respect and compassion for amphibians.
- Impart knowledge of the unique biology of native frogs and their ecological significance.
- Develop skills such as identifying native frogs and implementing water hygiene protocols.
- Enable the public to engage in actions that directly address the causes of frog decline.

6. Methodology

Orana's frog habitat will include a nocturnal display giving visitors the rare chance to see the animals; New Zealand's native frogs are normally difficult to view owing to their limited distribution, small size and superb camouflage. Within the development, visitors will also be able to view other introduced frog species to enable visitors, especially school children, to study the differences between native and introduced frogs.

Orana's breeding facility will be comprised of a changing room, primary work room and quarantine room. Both the work room and quarantine room will be housed within a refrigerated structure that can provide a climate controlled environment that can replicate environmental conditions recorded amongst successfully breeding wild colonies of the species. Temperatures will range from 1.7 to 27.1 degrees to simulate daily and annual variations, supplemented by manual control of humidity and other influential factors. Detailed records will be maintained to ensure that successful breeding can be replicated once it occurs. The work room and quarantine room will include large windows to allow visitors to see the research underway. Through holding the species, Orana will obtain more information about the management of Maud Island Frogs, helping to manage this and other species (particularly Hamilton's Frog) in captivity and in their natural habitats.

The primary structure of the breeding facility will be enclosed within a second structure that will include a light-shielded access way for visitors, displays of other amphibian species and keeper only service areas to maintain these introduced species separately.

Live food is already successfully reared at Orana to provide for our existing collection and this will be extended to support the Maud Island Frog population. Whilst the Park has not previously held native frogs, staff have had extensive experience in the husbandry of introduced frog species, having maintained display populations for many years. Additionally, the Park has made significant contributions to a range of managed breeding programmes including Kiwi, Blue Duck, Brown Teal, Cheetah and Rothschild's Giraffe. Most significantly, over 70 Orana-bred native birds have been released to the wild (Kiwi, Blue Duck and Brown Teal) as part of Department of Conservation Recovery Programmes for these endangered species. Furthermore, Orana is the only captive facility in New Zealand to have successfully bred the endangered native Mohua.

Orana Wildlife Park is the closest major zoo to the lead research institution for New Zealand native frogs (Otago University) and has a close working relationship with the preeminent researcher on these animals (Dr Phil Bishop). In order to ensure the success of the project, key partnerships will be developed and enhanced with a range of external agencies, including Otago University, Victoria University (Dr Ben Bell), the Native Frog Recovery Group, the Native Frog Research Group and Department of Conservation Species Protection Division. Under the guidance and supervision of these agencies the Trust is dedicated to supporting research to which we can contribute. The work has extremely important conservation value and offers exceptional opportunity for scientists to conduct extensive research that would directly support the in-situ work being conducted with the species.

As a nocturnal research and breeding centre Orana's habitat will give visitors the rare chance to see a native frog. New Zealand's frogs are difficult to view due to their limited range, small size, superb camouflage and because they are mostly nocturnal.

The main aim of the habitat is to breed and rear Maud Island Frogs from eggs through to adults because this has not been achieved in captivity. The project will also obtain more information about the frogs, helping to manage them in captivity and in the wild. It will also raise awareness of this lesser known endangered native species.

7. Project Budget

Works	Item	Requested from AArk*	Other Sources*
Research	Research existing facilities (Travel expenses)	\$570.16	
	Chytrid testing (groundwater and extg amphibian spp)	\$213.81	
Permits/Plans	Plans	\$ 1354.13	
	Permit Applications	\$ 712.70	
	Site leveling	\$ 712.70	
	subtotal	\$3563.50	
Outer Building Work	Steel beam		\$ 997.78
	Timber 200 x 50, 100 x 50		\$ 2708.26
	Shiplap		\$ 3420.96
	Ply wood		\$ 3420.96
	Concrete floor		\$ 712.70
	Mesh polystyrene		\$ 855.24
	Vinyl to floor (estimate over phone)		\$ 1781.75
	Cut existing floor for drainage		\$ 413.37
	Roofing iron (mesh, paper, nails etc)		\$1,000
	Double glazed window		\$ 666.38
	Hardware nails, bolts, paint, brackets etc		\$ 5701.61
	subtotal		\$21391.71
Climate Control Equipment	Fridge panel built by contractor		\$6189.81
	Refrigeration unit (temp.air control unit)		\$7697.17
	subtotal		\$13886.97
Electrical	Electrical all switch gear etc		\$7127.01
Breeding Equipment	Terrarium containers (x 10)		\$1425.40
	Quarantine containers (x 50)		\$356.35
	Sundry		\$1425.40
	subtotal		\$3207.15
Interpretation (Indoor)	Frog display terrarium		\$ 142.54
	A4 Light boxes (4 species, 1 conservation,1 personal action)		\$ 213.81
Interpretation (Outdoor)	1 @ 3000 x 1500		\$3563.50
	2 @1500 x1000		\$712.70
	subtotal		\$4632.55
Miscellaneous	Fittings, fixtures etc		\$3563.50
Construction Labour	600 hours @ \$30		\$12828.61
TOTAL PROJECTED COST			\$70201.01
PERCENTAGE		5%	95%

* Prices are quoted in US Dollars, this project has a total value of NZ\$98,500.00 including the contribution sought from the Amphibian Ark.

8. Scientific Citations

Bishop P. J., Haig A., Tocher M. D. and Marshall L. J. *Native Frog (Leiopelma spp.) Recovery plan 2008-2018*, Department Of Conservation.

Nadia Webster, *Native Frog Captive Husbandry Manual*, Department Of Conservation 30 April 2010
Draft Number: 1.1

Jacqueline Valerie Phoebe Le Roux, *The Remnant Leiopelma pakeka (Anura:Leiopelmatidae) Population on Maud Island: Population Size, Distribution and Morphology*.

M. Wakelin, C. Smuts-Kennedy, T. Thurley and N. Webster, *Artificial Cover Objects for Leiopelmatid Frogs*, DOC Science Internal Series 120.

Stephanie Shaw and Avi Holzapfel, *Mortality of New Zealand Native Frogs in Captivity*, DOC Research & Development Series 295.

Richard P. Elinson, Eugenia M. Del Pin, Daniel S. Townsend, Fabian C. Cuesta, And Peter Eichhorn, *Practical Guide to the Developmental Biology of Terrestrial-breeding Frogs*,

9. Timeline

The project is scheduled to commence on 1st July 2010 and is due to be completed around 30 October 2010. Note that this schedule is dependant upon funding applications being successful.

10. Letter of Endorsement

[attached - supplied by Dr Phil Bishop, Otago University]

11. Concluding Statement

Orana Wildlife Park is in a unique position to ensure positive results are achieved in the captive management of Maud Island Frogs. We have skilled, experienced and dedicated native fauna staff and a proven track record of success in captive management. Maintaining a captive population of Maud Island Frogs would clearly have an outstanding fit with the Park's aims of Conservation Education, Recreation and Research. Importantly, the project will be consistent with the Department of Conservation's Native Frog Recovery Plan as one of our project aims is to successfully breed and rear the species from eggs to adults (which has not yet been achieved in captivity) which would then enable Hamilton's Frog, an analog species, to also be secured in captivity.

The advocacy value of native frogs is exceptionally high since this is likely to be the only opportunity most individuals will have to view a native frog species. Whilst it is possible to conduct education for species not represented in our collection, their presence and our own contribution to the recovery of the species will add considerable validity to the messages conveyed. Given their many unique characteristics there is no doubt that appropriately displayed native frogs can have a considerable recreational value to visitors. Park staff look forward to working with Maud Island Frogs. With Amphibian Arks financial assistance we will deliver a high quality exhibit that will help preserve one of New Zealand's unique native amphibians.

Lynn Anderson
Chief Executive
Orana Wildlife Trust