



## Wallum Sedge Frog

*Litoria onlongburensis*  
Family Hylidae

### Other names:

Olongburra Frog  
Wallum Tree Frog  
Sharp-snouted Reed Frog

### Conservation Status:

The Wallum Sedge Frog is listed as Vulnerable under the following:

- New South Wales *Threatened Species Conservation Act 1995*
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
- Action Plan for Australian Frogs 1997
- IUCN Red List of Threatened Species 2006



Wallum Sedge Frog *Litoria onlongburensis*

photo: David Milledge

## Distribution, Abundance & Population Trends

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### National and State

Wallum Sedge Frogs are restricted to coastal habitats between Fraser Island in Queensland and Yuraygir National Park, north of Woolgoolga in northern New South Wales. Coastal habitats include Bribie, Moreton and North Stradbroke Islands (Hines et al. 1999, Meyer et al. 2005, DEH 2006). The patchy distribution of Wallum Sedge Frogs within this area is closely linked to the occurrence of suitable "wallum" habitat (Coaldrake 1961).

In New South Wales there are extensive areas of known Wallum Sedge Frog habitat with large populations occurring in Broadwater, Bundjalung, and Yuraygir National Parks, Tyagarah Nature Reserve and north of Ballina near Lennox Head. Numerous smaller populations are also known to occur between these locations.

The geographic range of Wallum Sedge Frogs does not appear to have changed since European settlement; however, their area of occupancy has been reduced and fragmented through land clearing and wetland modification (Meyer et al. 2005).

There are no reliable estimates of population size (DEH 2006) although data presented by Lewis and Goldingay (2005) for several sites in northern New South Wales show that Wallum Sedge Frogs can reach densities of over 100 individuals/100m<sup>2</sup>, although lower densities

of 50 individuals/100m<sup>2</sup> were recorded at most sample sites. However, density is not even throughout the species' range and the figures of Lewis and Goldingay (2005) are not an accurate representation of a national population estimate.

Due to the number and extent of threatening processes that affect Wallum Sedge Frogs and their habitat, it is highly likely that their population has declined since European settlement and is continuing to decline due to a range of threatening processes acting on the smaller, more isolated populations. Although Lewis and Goldingay (2005) found no evidence of declining populations during their four-year study in northern New South Wales, the majority of their sites were in conservation reserves.

Wallum Sedge Frogs exhibit genetic structuring on a north-south gradient, with genetic differences between northern New South Wales, North Stradbroke Island, Moreton Island and Cooloola-Fraser populations (DEH 2006).

### Local

Wallum Sedge Frogs are distributed throughout the coastal areas of Byron Shire. Known populations occur in Billinudgel, Broken Head, Tyagarah and Broken Head Nature Reserves and Arakwal National Park, and at many

sites adjoining and between these reserves. There are many records in the vicinity of the West Byron Sewage Treatment Works, although this is probably indicative of the high survey effort in this area rather than evidence of a greater abundance of Wallum Sedge Frogs. Gaps in distribution exist between Billinudgel and Brunswick Heads Nature Reserves and Arakwal National Park and Broken Head Nature Reserves possibly due to the pattern

of settlement in these areas.

There are no published population estimates for Byron Shire but two sites sampled by Lewis and Goldingay (2005) at Brunswick Heads and in Tyagarah Nature Reserve had highest densities of 25 and 170 individuals/100m<sup>2</sup> respectively.

## Ecology

### Habitat

The Wallum Sedge Frog belongs to a group of frogs called “wallum” or “acid” frogs (Ingram and Corben 1975). These terms are derived from their preferred habitat which includes the banksia-dominated heath and shrubland ecosystems of the coastal lowlands of southern Queensland and northern New South Wales (Ingram and McDonald 1993, DEC 2006, DEH 2006).

Core habitat is acidic (pH<6) freshwater wetlands on low nutrient, sandy soils with associated peat layers. Wallum Sedge Frogs use a variety of habitat types, including heathland, sedgeland, paperbark forests, woodlands and dams constructed in wallum habitats; however, their preferred breeding habitat is seasonally inundated sedge swamps.

Individuals are often recorded clinging to emergent vegetation, including sedges, reeds and ferns, particularly the sedge *Lepironia Lepironia articulata*. There is no published information on non-breeding habitat requirements (Hines et al. 1999) although individuals have been found under the bark of Broad-leaved Paperbarks *Melaleuca quinquenervia* (D. Milledge unpubl. data).

### Home Range, Shelter and Movements

The home range of Wallum Sedge Frogs is yet to be documented. During the day individuals seek shelter near the base of vegetation and at night climb to higher positions to forage and call. They are sometimes recorded in exposed positions during the day, particularly

Figure 3: Typical Wallum Sedge Frog habitat

photo: David Milledge



in wet weather. They remain in shelter near the base of vegetation during dry weather but appear to move freely across the landscape in wet conditions (Lewis and Goldingay 2005, Goldingay and Taylor 2006).

Lewis and Goldingay (2005) suggested that individuals may recolonise habitat over distances of 500m and Goldingay and Taylor (2006) recorded numerous road-killed Wallum Sedge Frogs near Lennox Head that indicated the species disperses from breeding habitat. DEH (2006) suggest that Wallum Sedge Frogs are successful colonists provided there is a natural corridor to aid dispersal and/or suitable weather conditions (e.g. flooding).

### Diet

Tadpoles forage on biofilm that covers submerged reed and sedge stems (James 1996). Metamorphs are reported

to take mosquitoes (Anstis 2002) and although there is no published information on the diet of adults, this most likely includes a variety of insects.

### Breeding

Male Wallum Sedge Frogs call during the day and night in spring, summer and early autumn when suitable standing water is available (DEH 2006). Breeding habitat is typically in sedge swamps with oligotrophic, tannin stained, acidic waters (pH <6) between 0.5-1.5m depth.

Eggs are laid in still water, attached to the stems of sedges and grasses. Tadpoles are free swimming, being able to move independently of water currents and there is no published information on the duration of the tadpole phase.

## Threats

### *Habitat Loss and Modification*

Wallum Sedge Frogs are restricted to an area of eastern Australia currently experiencing increased urban and rural growth. Although there are large areas of known habitat within conservation reserves, these reserves and smaller areas of habitat outside reserves are becoming increasingly isolated by clearing and draining for settlement, infrastructure and agriculture. Loss of adjacent refuge and dispersal habitat may be as significant as loss of breeding habitat for the long-term viability of populations. Sand mining and associated disturbances and clearing once represented a significant threat and could do so again if recommenced.

Wallum Sedge Frog habitat is detrimentally affected by changes to moisture regimes that cause ephemeral waterbodies to dry out too quickly or become permanent, restricting breeding or giving advantage to competitors and predators. Loss of water quality also adversely affects breeding, with eutrophication raising pH and advantaging competitors.

Impacts of fire on Wallum Sedge Frog populations are poorly understood (Lewis and Goldingay 2005) but could remove refuge or dispersal habitat at critical times. Road construction has been demonstrated to have the potential to severely reduce the numbers of dispersing individuals, with an estimate of 10,000 individuals killed annually over a 4km section (Goldingay and Taylor (2006).

Grazing adversely affects habitat by trampling and loss of

reeds and sedges, and Feral Pigs (*Sus scrofa*) also destroy vegetation near wetlands.

### *Pesticides and Herbicides*

Currently there is no published information regarding the impact on Wallum Sedge Frogs of pesticides and some herbicides to control mosquitoes and aquatic weeds in wetlands. It is thought that excessive use of pesticides and herbicides may have a detrimental impact on Wallum Sedge Frog populations by reducing prey abundance and damaging the health of eggs, tadpoles and adults.

### *Introduced Predators*

Both the Plague Minnow *Gambusia holbrooki* and Cane Toad *Bufo marinus* may have a detrimental impact on Wallum Sedge Frog populations although data on the impacts of these predators are lacking. Predation by the Plague Minnow has been identified as posing a significant threat to native frog populations (Meyer et al. 2005) and could have a significant effect on the Wallum Sedge Frog in habitats that have already been affected by other disturbance, such as in waters with raised pH. Similarly, Cane Toads may represent a significant threat in areas subject to habitat modification such as grazing.

### *Disease*

Amphibian chytridiomycosis has been blamed for the declines of several species of Australian frogs. Although the disease has not been identified as affecting Wallum Sedge Frogs, it is a potential threat wherever there is human disturbance of their habitats.

## Management Recommendations for Byron Shire

- Identify and record Wallum Sedge Frog habitat in the Shire.
- Prevent livestock and feral animal access to Wallum Sedge Frog habitat.
- Determine and implement appropriate fire regimes in and adjacent to Wallum Sedge Frog habitat.
- Manage recreational use of coastal lakes in order to exclude or reduce direct human intrusion into Wallum Sedge Frog habitat.
- Restore degraded Wallum Sedge Frog habitat and habitat links through targeted projects involving removal of foreign soil used for fill, removal of drains, weed control (see below) and revegetation with sedge and heathland species.
- Maintain or restore wide vegetated buffers around Wallum Sedge Frog habitat using dense sedge, reed and heath ground cover plants. Vegetation within a minimum 50 metres from breeding sites must be conserved.
- Maintain or restore natural water regimes in and adjacent to Wallum Sedge Frog habitat by allowing seasonal inundation to occur through not draining or damming surface waters.
- Direct storm water runoff away from known habitats, or treat waters entering Wallum Sedge Frog habitat by removing nutrients and other pollutants through the use of artificial wetlands and tea tree mulch beds or peat based filter systems.
- Undertake weed control in Wallum Sedge Frog habitat, including control of aquatic weeds, by mechanical methods or if herbicide use cannot be avoided, only spray or paint during dry periods. In all attempts be sure to minimise the use of biocides.
- Provide wide culverts or bridges at road crossings of drainage lines or wetlands in Wallum Sedge Frog habitat, with well-vegetated approaches to such underpasses.
- Establish effective Cane Toad control programs for Wallum wetlands by restricting breeding opportunities through removal of dams and other permanent and semi-permanent water bodies, or establish dense fringing ground cover vegetation around such water bodies.
- Road construction should not be carried out through any known Frog habitat areas.
- Establish a monitoring program for known populations and habitats.

## References

- Anstis, M. 2002. *Tadpoles of South-eastern Australia. A guide with keys.* Reed New Holland, Sydney, NSW.
- Coaldrake, J.E. 1961. *The Ecosystems of the Coastal Lowlands ("Wallum") of Southern Queensland.* CSIRO Bulletin 283. CSIRO, Melbourne, Vic.
- Department of Environment and Conservation. 2006. *Olongburra Frog - profile.* [www.threatenedspecies.environment.nsw.gov.au](http://www.threatenedspecies.environment.nsw.gov.au) (accessed 23/11/2009).
- Department of the Environment and Heritage. 2006. *Litoria olongburensis in Species profile and threats database.* Department of the Environment and Heritage, Canberra, ACT. <http://www.deh.gov.au/sprat> (accessed 3/8/2006).
- Goldingay, R. L. and Taylor, B. D. 2006. *How many frogs are killed on a road in northeast New South Wales?* *Aust. Zool* 33: 332-336.
- Hines, H., Mahony, M. and McDonald, K. 1999. *An assessment of frog declines in wet sub-tropical Australia.* Pp 44-63 in *Declines and Disappearances of Australian Frogs*, ed A. Campbell. Environment Australia, Department of the Environment and Heritage, Canberra, ACT.
- Ingram, G.J. and Corben, C.J. 1975. *The frog fauna of North Stradbroke Island, with comments on the 'acid' frogs of Wallum.* *Proceedings of the Royal Society Queensland* 86: 49-54.
- Ingram, G. J. and McDonald, K. R. 1993. *An update on the decline of Queensland's frogs.* Pp 297-303 in *Herpetology in Australia*, ed D. Lunney and D. Ayers. Surrey Beatty and Sons, Chipping Norton, NSW.
- James, C. (1996). *Conservation genetics of island and mainland populations of the sedge frogs Litoria cooloolensis and Litoria olongburensis.* Unpublished report to Queensland Department of Environment and Heritage. Department of Zoology, Centre for Conservation Biology, University Of Queensland.
- Lewis, B. D. and Goldingay, R. L. 2005. *Population monitoring of the vulnerable Wallum Sedge Frog (Litoria olongburensis) in northeastern New South Wales.* *Aust. J. Zool.* 53: 185-194.
- Meyer, E., Hero, J., Shoo, L. and Lewis, B. 2005. *Recovery plan for the Wallum Sedge Frog and other wallum-dependent frog species 2005-2009.* Report to the Department of the Environment and Heritage, Canberra, ACT and the Queensland Parks and Wildlife Service, Brisbane, Qld.
- Tyler, M. J. 1997. *The action plan for Australian frogs.* Department of the Environment and Heritage, Canberra, ACT.