

# How much water does a frog need?

Gwydir wetlands frog monitoring spring–summer 2015–17



## Overview

Frogs are a key part of wetland fauna. The presence, number and activity of marsh species are good indicators of wetland condition and recent water flows, as they are positively affected by flows from the river. NSW Office of Environment and Heritage (OEH) staff are monitoring the response of frogs to natural and managed flows in the Gwydir wetlands as part of the environmental water program.

## Survey conditions

We completed site surveys during September and November of 2015 and 2016 and February 2017 at regular sites in the Gingham, the Lower Gwydir and Mehi-Mallowa wetlands. The February 2017 surveys were additional to our regular schedule to capture frog responses to the December 2016 managed environmental flows.

## Key findings

We observed twelve species over all five survey rounds: marsh species, four burrowing species and tree frog species. Local temperature and recent rainfall influenced which species were seen; for example, burrowing and tree frogs liked warmer

weather and more rain. We saw marsh frog species during all surveys. The most widespread was the barking marsh frog which was at every survey site.

We consistently heard marsh frogs and one tree frog at core floodplain sites in the Lower Gwydir and Gingham. Overall, we heard more species and more individuals in September 2016 than in September 2015. We observed that more marsh frog species had recruited by November 2016 than in November 2015, with higher numbers of individuals at more wetlands, due to the recent rains and larger area of flooded wetland in 2016. The high level of calling activity in February 2017 reflected the recent managed environmental flows in the area.

The Bunnor bird hide, Molladree and Old Dromana sites consistently had a high number of marsh frog individuals. Following flooding and rain in September 2016, there was a very high number at Little Lagoon, Munwonga, and Gingham Waterhole. We counted over 200 individuals from different species at Little Lagoon and Munwonga in February 2017 and November 2016 respectively. We saw eight species at Boyanga Waterhole, the highest number seen at any one site over all surveys.





## What it all means

Marsh frogs like wet wetlands!

Marsh frogs prefer to breed and lay eggs in shallow, vegetated, warm water and the larger the flood the more space for more breeding!

They like natural waterholes that hold water for a long time, like Gingham and Boyanga waterholes, as they use the waterholes for shelter and refuge as the floodplain dries out. This is important as frog marsh tadpoles need at least three to four months to become little frogs.

## Mallowa Floodplain

Only the February 2017 surveys coincided with a managed environmental flow event in the Mallowa. The earlier surveys found few marsh frogs at the dams with some breeding evident. The February surveys recorded high levels of breeding activity (calling) by three marsh frog species particularly at the Valetta floodplain site, with six species identified overall. It is likely that the environmental water led to recruitment of marsh frogs as long as the water remained in the Mallowa floodplain for at least three months to allow tadpoles to complete metamorphosis. Frog surveys planned for spring 2017 will help give us more information on the outcomes of the summer 2016-17 flows.

Marsh frogs	<b>Barking marsh frog</b> <i>Limnodynastes fletcheri</i>	<b>Broad-palmed frog</b> <i>Litoria latopalmata</i>	<b>Eastern sign-bearing froglet</b> <i>Crinia parinsignifera</i>	<b>Salmon-striped frog</b> <i>Limnodynastes salmini</i>	<b>Spotted marsh frog</b> <i>Limnodynastes tasmaniensis</i>
	<b>Ornate burrowing frog</b> <i>Platyplectrum ornatum</i>	<b>Striped burrowing frog</b> <i>Litoria alboguttata</i>	<b>Warty water-holding frog</b> <i>Litoria verrucosa</i>	<b>Water-holding frog</b> <i>Cyclorana platycephala</i>	
	<b>Desert tree frog</b> <i>Litoria rubella</i>	<b>Green tree frog</b> <i>Litoria caerulea</i>	<b>Peron's tree frog</b> <i>Litoria peroni</i>		
Burrow frogs					
Tree frogs					

	Spring September 2015	Early summer November 2015	Spring September 2016	Early summer November 2016	Late summer February 2017
<b>Temperature °C: mean (min-max)</b>	<b>14</b> (9-19)	<b>23</b> (17-28)	<b>15</b> (12-18)	<b>21</b> (16-25)	<b>24</b> (18-29)
<b>Rain summary</b>	No rain prior	Some prior, none during	Much rain prior and during	None	None
<b>Species observed (all sites, includes incidentals)</b>	Barking marsh frog	Barking marsh frog	Barking marsh frog	Barking marsh frog	Barking marsh frog
	Broad-palmed frog	Broad-palmed frog	Broad-palmed frog	Broad-palmed frog	Broad-palmed frog
		Eastern sign-bearing froglet	Eastern sign-bearing froglet	Eastern sign-bearing froglet	Eastern sign-bearing froglet
	Salmon-striped frog	Salmon-striped frog	Salmon-striped frog	Salmon-striped frog	Salmon-striped frog
	Spotted marsh frog	Spotted marsh frog	Spotted marsh frog	Spotted marsh frog	Spotted marsh frog
	Peron's tree frog	Striped burrowing frog	Striped burrowing frog	Striped burrowing frog	Ornate burrowing frog
		Warty water-holding frog	Peron's tree frog	Water holding frog	Striped burrowing frog
		Desert tree frog		Peron's tree frog	Desert tree frog
		Peron's tree frog			Green tree frog
					Peron's tree frog
<b>Number of species</b>	<b>6</b>	<b>9</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>Species heard at 13 core Gingham- Lower Gwydir floodplain sites (number of sites where detected)</b>	Barking marsh frog (10)	Barking marsh frog (3)	Barking marsh frog (5)	Barking marsh frog (9)	Barking marsh frog (7)
	Eastern sign-bearing froglet (8)	Broad-palmed frog (2)	Broad-palmed frog (1)	Broad-palmed frog (2)	Broad-palmed frog (4)
	Spotted marsh frog (12)	Peron's tree frog (3)	Eastern sign-bearing froglet (4)	Eastern sign-bearing froglet (1)	Eastern sign-bearing froglet (5)
	Peron's tree frog (5)		Salmon-striped frog (3)	Spotted marsh frog (2)	Spotted marsh frog (4)
			Spotted marsh frog (5)	Peron's tree frog (6)	Ornate burrowing frog (1)
			Striped burrowing frog (1)		Striped burrowing frog (1)
			Peron's tree frog (2)		Green tree frog (1)
					Peron's tree frog (5)
<b>Number of species</b>	<b>4</b>	<b>3</b>	<b>7</b>	<b>5</b>	<b>8</b>
<b>Species with tadpoles</b>	Barking marsh frog		Barking marsh frog	Barking marsh frog	Barking marsh frog
	Spotted marsh frog		Spotted marsh frog	Spotted marsh frog	Spotted marsh frog
					Litoria sp
<b>Species with recently completed metamorphs</b>	Barking marsh frog	Barking marsh frog		Barking marsh frog	
		Spotted marsh frog		Eastern sign-bearing froglet	
				Salmon-striped frog	
				Spotted marsh frog	
				Water-holding frog	
<b>Number of breeding species</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>3</b>

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