A RANGE EXTENSION FOR THE BLOTCHED BLUE TONGUE SKINK (*TILIQUA NIGROLUTEA*) (SCINCIDAE) AND IMPLICATIONS FOR ITS FUTURE SURVIVAL

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Reptiles are one of the most poorly studied vertebrate groups across the vast majority of Australian ecosystems when compared to birds and mammals (MacNally & Brown, 2001). The paucity of knowledge regarding the distribution of reptiles across Australia is reflected in a number of published range extensions in recent times (eg., Fearn, 1998; Gaikhorst, 2002; Sass *et al*., 2005).

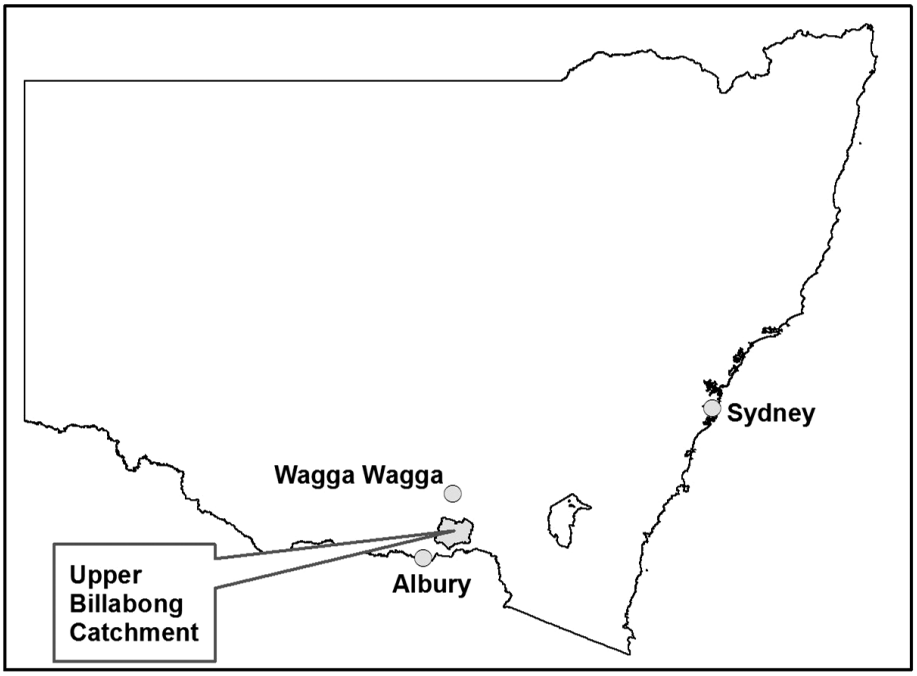
Tiliqua nigrolutea is a large viviparous skink with an average adult snout-vent length of about 300 mm for northern populations and a maximum of 368 mm (Shea, 1992). It is omnivorous with diet including invertebrates and plant material (Shea, 1982, 2006). The species has been recorded from Tasmania, South Australia, Victoria and New South Wales (Cogger, 2000). In New South Wales, it is typically associated with cool climates and moderate to high elevations (Swan *et al*., 2004) with most records confined to a number of disjunct populations centered around the Blue Mountains and Central Tablelands area in the north, and the Southern Tablelands and Snowy Mountains in the south (DECC, 2007). *Tiliqua nigrolutea* is known to inhabit a variety of habitats ranging from grasslands, woodlands and forests (Shea 1982, 1992), where it is a solitary species, individuals only coming together for mating in spring and early summer (Shea, 1982).

In the South-West Slopes region of New South Wales, the lack of dedicated reptile surveys is highlighted by a paucity of museum records, public records and published papers. However in recent years, several workers have provided much-needed information on the status and distribution of the region's herpetofauna (Annable, 1995; Daly, 2004; Lemckert, 1998; Michael, 2004; Sass, 2003). This note documents a range extension for *Tiliqua nigrolutea* and adds to the limited knowledge of the herpetofauna of the region. The implications of climate change for future survival of this population are discussed.

During reptile surveys conducted over 43 woodland and forest remnants in the Upper Billabong creek catchment area in southern New South Wales (Figure 1), one *Tiliqua nigrolutea* was captured on 17 November 2005 (Figure 2). This individual was captured during pitfall trapping within a 19.3 ha forest remnant (AGD66, 526117E, 6070186N) approximately 55 km south-east of Wagga Wagga. This remnant is characterised by inland scribbly gum (*Eucalyptus rossii*) and red stringybark (*Eucalyptus macrorhyncha*) with an understorey of blue flax lily (*Stypandra glauca*) (Figure 2) and exists within an agricultural landscape matrix. Within one kilometre of the remnant exist large areas of radiata pine plantations. The significance of this new record is highlighted by the spatial distribution of all previous records in New South Wales (Figure 3).

Using data from museum records of *Tiliqua nigrolutea* in New South Wales and northern Victoria, Hancock and Thompson (1997) created a climate profile to predict distributional limits for this species. This climate profile predicts that *Tiliqua nigrolutea* will only occur where the average maximum temperature of the warmest month does not exceed

Figure 1. Location of the Upper Billabong creek catchment in southern NSW



31.1º C, although the predicted distribution was noticeably greater than the known distribution, particularly in the north, north-west and east. They also reported that populations in New South Wales are limited to elevations above approximately 500 m above sea level (asl), although more southern populations in Victoria and Tasmania do reach the coast.

The remnant where this species was recorded during this study is 440 metres asl, below the range reported by Hancock and Thompson (1997) for New South Wales, although the locality is at or near the western limit of the predicted distribution. Their general conclusion is that the distribution range for *Tiliqua nigrolutea* is limited by specific temperature requirements influenced by elevation (Hancock & Thompson, 1997). With temperatures exceeding 40º C recorded during the surveys (BOM, 2007) this population is likely to be existing near the limit of the species' thermal tolerances.

The impacts of climate change on populations that are considered sensitive to temperature and elevation are expected to be detrimental. Large-scale movements and shifts in distribution patterns are two likely responses to climate change across the majority of taxa (Lindenmayer & Fischer, 2006). Species that are most vulnerable to climate change are predicted to be those that are geographically isolated, have poor dispersal capabilities and have an altitudinal restricted distribution (New, 2000). While it could be argued that climate change has contributed to these patterns of movement and distribution in the past (Cogger & Heatwole, 1981), these have generally been over a much longer period of time. Present patterns of climate change are more rapid and extreme than previously experienced (McCarty, 2001). *Tiliqua nigrolutea* fits within

Figure 2. One *Tiliqua nigrolutea* was captured during pitfall trapping (top) and the forest remnant where this individual was recorded (below).

the broad categories of vulnerability suggesting that it has a high potential for local extinction (New, 2000).

This record of *Tiliqua nigrolutea* provides further evidence that our knowledge of the herpetofauna within the South-West Slopes region of NSW is limited and requires further investigation, as this species is a moderately sized and reasonably conspicuous lizard that, until now, has not been detected. Additionally, this 'lowland' population of a species typically associated with cool climates is likely to be vulnerable should climate change increase temperatures in the region.

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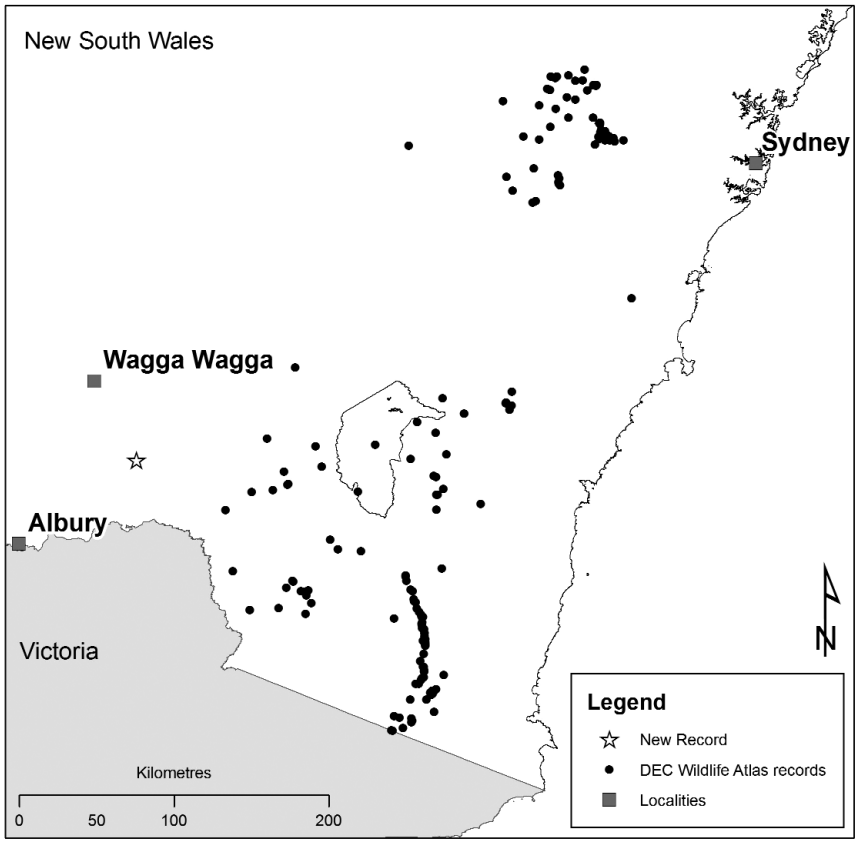
Figure 3. Spatial representation of previous records and the new record for *Tiliqua nigrolutea* across New South Wales (Data source: NSW Atlas of Wildlife Database, DECC, 2007).



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