

# NSW SCIENTIFIC COMMITTEE

## Preliminary Determination

The Scientific Committee, established by the *Threatened Species Conservation Act 1995* (the Act), has made a Preliminary Determination to support a proposal to list the Bellinger River Snapping Turtle *Myuchelys georgesii* (Cann, 1997) as a CRITICALLY ENDANGERED SPECIES Part 1 of Schedule 1A of the Act. Listing of Critically species is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. The Bellinger River Snapping Turtle *Myuchelys georgesii* (Cann, 1997) (family Chelidae) is a moderately large, short-necked, freshwater turtle described by Cogger (2014) as “brown above, dull whitish below. Usually a distinct yellow stripe from the angle of the jaws, especially in the young. Shell above broadly oval, not extended posteriorly, with a smooth hind edge. Plastron moderate, nearly twice as long as broad, the front and rear lobes tapering from the bridge. Intergular shield as wide as or wider than each gular shield. Neck above with low rounded tubercles. No alveolar ridge on the maxilla. Macrocephaly does not occur. 20 cm (shell length).” In addition, the head and neck are shorter than the length of the shell, a central groove on the carapace is absent, the tail lacks bright markings and there are five claws present on both webbed forelimbs (Cann 1997; Georges and Thomson 2010; Cogger 2014). *M. georgesii* is morphologically similar to the Saw-shelled Turtle *M. latisternum*, Purvis’s Turtle *M. purvisii* and Western Saw-shelled Turtle *M. belli* (Cogger 2014) but is genetically distinct (Georges and Adams 1996; Fielder *et al.* 2012).
2. The Bellinger River Snapping Turtle *Myuchelys georgesii*, also called Georges’ Turtle, was previously known as *Elseya* sp. (Bellingen), *Elseya* sp. 3, *Elseya georgesii* and *Elseya latisternum georgesii* (Georges and Adams 1992, 1996; Cogger *et al.* 1993; TFTSG 1996; Allanson and Georges 1999; Spencer *et al.* 2007; Artner 2008). In addition, the genus name is currently disputed with *Wollumbinia georgesii* used in some publications (Georges and Thomson 2010; Wilson and Swan 2010; Cogger 2014).
3. The Bellinger River Snapping Turtle should not be confused with a turtle referred to in the literature as the “Bellinger River Emydura”, “Bellinger River Turtle” or “*Emydura macquarii* (Bellinger River form)” (Cann 1998; Spencer & Thompson 2000; New South Wales NPWS 2001; Blamires *et al.* 2005) which was previously listed in New South Wales as a Vulnerable species (New South Wales Scientific Committee 1997), but was removed from the threatened species list (New South Wales Scientific Committee 2009) and is not the subject of this determination.
4. *Myuchelys georgesii* is endemic to New South Wales and is restricted to the Bellinger catchment in coastal north eastern New South Wales (Cann 1998; Georges and Thomson 2010; Cogger 2014). In the Bellinger catchment *M. georgesii* co-occurs with two more widespread freshwater turtle species; the Eastern Long-necked Turtle (*Chelodina longicollis*) and the Macquarie Turtle (*Emydura macquarii*) (Cann 1998; Georges and Thomson 2010). The latter species is thought to have been introduced to the Bellinger catchment from nearby rivers (Georges *et al.* 2007; 2010). Hybridisation between *E. macquarii* and *M. georgesii* appears to be occurring in the Bellinger catchment producing morphologically atypical individuals (Georges *et al.* 2007; Spencer *et al.* 2007; NSW Scientific Committee 2009; OEH *in litt.* June 2015).
5. Within the Bellinger River, *Myuchelys georgesii* has only been recorded in the mid-section of the river from Bellingen township upstream to east of Brinerville (Spencer *et al.* 2007). The species has not been recorded from the Never Never River which enters the Bellinger River at Gordonville, nor from

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all but the lower 600 m of the Rosewood River which meets the Bellinger River near Thora (OEH *in litt.* June 2015). The status of *M. georgesi* in the Kalang River is uncertain. The Kalang River is the other major river in the Bellinger catchment which meets the Bellinger River near its mouth at Urunga (Georges *et al.* 2007). Cann (1993) reported that *M. georgesi* was present in a few scattered locations in the Kalang River, however surveys in 2000, 2007 and 2015 found no specimens of *M. georgesi* but found several turtles which appear to be *M. georgesi* X *E. macquarii* hybrids (OEH *in litt.* June 2015). There are no specimens of *M. georgesi* from the Kalang River in museum collections.

6. The headwaters of the Bellinger River fall from ~1300 m a.s.l. and are predominately (~60%) forested (Georges *et al.* 2007; Blamires and Spencer 2013). As a consequence the Bellinger River has cool clear water, and alternates between deep pools, boulder rapids, and still sandy-bottomed sections (Cogger 2014). *Myuchelys georgesi* has a preference for moderate to deep pools (> 2 m) with a rocky substrate (Spencer *et al.* 2007; Blamires and Spencer 2013; Spencer *et al.* 2014). Although their preferred habitat is patchily distributed, *M. georgesi* appears able to move readily between pools under normal conditions (Blamires and Spencer 2013). *Myuchelys georgesi* is primarily aquatic and rarely, if ever, disperses overland but will bask on the river bank and on trees that have fallen into the river (Cann 1998). The diet of *M. georgesi* is omnivorous consisting predominately of benthic macro-invertebrates, along with fruit and aquatic vegetation (Cann 1997; Alanson and Georges 1999). During winter, activity in *M. georgesi* is significantly reduced and individuals are rarely encountered.
7. Nesting in *Myuchelys georgesi* is terrestrial with females laying clutches of 10–25 (averaging 15-20) brittle-shelled eggs during late spring and early summer (Cogger 2014; OEH *in litt.* June 2015). Hatchlings emerge after 72 days at an average nest temperature of ~27°C (Cann 1997) and hatching success in the absence of predation is 85% (Blamires *et al.* 2005). Eggs are laid in excavations on the river banks and the few nests that have been studied were  $170 \pm 24$  mm deep, within 10 m of the waters edge and located in heavily vegetated areas (Blamires *et al.* 2005). Females are estimated to reach sexual maturity at ~8 years, males at 5–6 years and maximum longevity is estimated to be ~29 years (Blamires *et al.* 2005; Spencer 2006). Generation length is likely to be ~20 years. In the closely related *M. belli*, males reach sexual maturity at ~10 years and females at ~20 years with a predicted lifespan of over 40 years (Fielder *et al.* 2014). Many Australian freshwater turtles, including *M. georgesi*, exhibit type III survivorship where mortality rates decrease with age (Spencer & Thompson 2000; Blamires *et al.* 2005; Blamires and Spencer 2013). This results in populations strongly biased towards large/old adults (Blamires *et al.* 2005). As a consequence of these life history traits, the stability of turtle populations is sensitive to changes in adult survivorship (Georges *et al.* 1993; Blamires *et al.* 2005; Blamires and Spencer 2013) and their ability to recover from a catastrophic loss of adults is likely to be limited.
8. The geographic distribution of *Myuchelys georgesi* is estimated to be very highly restricted. The extent of occurrence (EOO) for *M. georgesi* is 145 km<sup>2</sup> based on a minimum convex polygon enclosing all mapped occurrences of the species, the method of assessment recommended by IUCN (2014). This estimate includes the potential Kalang River population. If records for the Bellinger River only are included the EOO for *M. georgesi* is 115 km<sup>2</sup>. The area of occupancy (AOO) is estimated to be 5.2 km<sup>2</sup> based on the mapped area of riverine habitat known to be occupied by the species (OEH *in litt.* 2015). This method of estimating AOO is considered most appropriate for a primarily aquatic species that is confined to a linear habitat. These estimates of AOO and EOO are based on historically suitable habitat and specimen records. The contemporary distribution of *M. georgesi* may be more highly restricted, as both the AOO and EOO have potentially declined in 2015 due to a disease outbreak (see point 9).

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9. The *Myuchelys georgesi* population in the Bellinger River has recently experienced a substantial decline. A rapid and unexpected mortality event, commenced in early 2015 (first reported 16 February). The restriction of the event to a single species, post mortem examination of affected individuals and the pattern of spread are consistent with a disease outbreak, although the cause/s or the pathogen/s involved are currently unknown (Spencer 2015; OEH *in litt.* June 2015). The mortality rate amongst infected individuals is 97% (OEH *in litt.* June 2015). Since the outbreak 426 dead turtles have been recovered, mostly adult *M. georgesi* (up until 15 April) (OEH *in litt.* June 2015). Although this represents the loss of 13% to 27% of the total estimated population, it is likely to be an underestimate as not all carcasses are likely to have been found (OEH *in litt.* June 2015; Spencer 2015). *Myuchelys georgesi* appears to be the only species currently affected and as of 15 April 2015 sick or dead individuals have been found from Bellingen upstream for 55 km, which covers over 90% of the species' known distribution (OEH *in litt.* June 2015). As the mortality event is likely to have continued spreading upstream the entire distribution of *M. georgesi* in the Bellinger River is now likely to be impacted. Although reports of sick or dead turtles had ceased by May 2015 this coincides with the time *M. georgesi* usually become inactive with the onset of the cooler months. Therefore an assessment of the full impact of the mortality event and whether it is ongoing will now not be possible until spring (OEH *in litt.* June 2015).
10. Other threats to *Myuchelys georgesi* include the predation of nests and nesting females by the introduced Red Fox (*Vulpes vulpes*). Blamires *et al.* (2005) reported a turtle nest predation rate of 72% (from foxes and goannas (*Varanus varius*)) along the Bellinger River, although elsewhere in Australia it is known to exceed 90% from foxes alone (Thompson 1983). Foxes are also known to prey on nesting females (Spencer and Thompson 2000; Blamires *et al.* 2005; Spencer *et al.* 2007). Short-necked turtles are thought to be particularly vulnerable to fox predation because they are unable to fully retract their limbs and head (Spencer and Thompson 2005). Habitat degradation, including changes to water quality (e.g. increased water turbidity) and increased sedimentation of deep pools as well as the removal or degradation of riparian vegetation are also threats (Blamires and Spencer 2013; OEH *in litt.* June 2015). Hybridisation with and competition from *E. macquarii* may also be a threat (Blamires *et al.* 2005; Georges *et al.* 2007; Spencer *et al.* 2014). 'Predation by the European Red Fox *Vulpes vulpes*' is listed as a Key Threatening Process under the *Threatened Species Conservation Act 1995*.
11. Within its highly restricted distribution *Myuchelys georgesi* was, until recently, described as common or locally abundant (Spencer *et al.* 2007; Georges *et al.* 2007). In 2005, the total population of *M. georgesi* was estimated to be  $\sim 4500 \pm 1400$  individuals and modelling suggested the population was stable (Blamires *et al.* 2005). There is some evidence to suggest that after 2007 a population decline occurred, associated with historically low river levels (2013-2014) and abnormal rainfall conditions (OEH *in litt.* June 2015). In early 2015 the total population of *M. georgesi* was estimated to be between 1600 and 3200 individuals (OEH *in litt.* June 2015). The current population size is unknown but is likely to be substantially lower than previous estimates due to recent (February 2015) disease related mortality. The total number of mature individuals of *M. georgesi* is therefore estimated to be low.
12. *Myuchelys georgesi* (Cann, 1997) is eligible to be listed as a Critically Endangered species as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation 2010*:

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## Clause 7 Restricted geographic distribution and other conditions

The geographic distribution of the species is estimated or inferred to be:

(a) Very highly restricted,

and either:

(d) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:

(a) an index of abundance appropriate to the taxon, or

(b) the geographic distribution, habitat quality or diversity, or genetic diversity.

Dr Mark Eldridge  
Chairperson  
NSW Scientific Committee

Exhibition period: 28/08/15 – 23/10/15

Proposed Gazettal date: 28/08/15

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