Golden-Crowned Snake (Cacophis squamulosus) from the South Coast of New South Wales. (Photo: G. Daly). See article on the herpetofauna of Morton National Park on page 5.

Mating Southern Water Skinks (Eulamprus heatwolei). See article on mating behaviour of this species on page 25.
At 1300 hr on 30 October 2003, in cool (approximately 10°C) but sunny weather, we observed courtship, copulation and mate defence in Southern Water Skinks (Eualamprus heatwolei). We were conducting fieldwork in the Brindabella Range near Canberra and had stopped for lunch at the Bulls Head survival shelter on Mt Franklin Road, in Namadgi National Park (35°23'16"S 148°48'13"E). Previous roadwork involving grading and repositioning of large logs had created a deep ditch between logs along the roadside. A wooden bridge had been put in place over the ditch to help picnickers reach the shelter safely, and as we were unloading the car, we noticed several Eualamprus heatwolei scurrying under the bridge and along the ditch.

A closer inspection of the ditch seconds later revealed the act of copulation taking place. The larger male had taken hold of the smaller female by biting her on the left flank, just below her left forelimb. His body was curled around above the female's, with his tail positioned up and under her tail, allowing intromission of his left hemipene (Fig. 1). Copulation lasted several minutes before they separated. The female then ran off along the ditch, with the male in hot pursuit, following her closely in and over the logs. Another smaller male then appeared, and advanced towards the female. The larger male promptly chased him off. The smaller male stopped a short distance away (approximately 1 m) and there followed much head-bobbing between the two males. Again, the larger male charged towards the intruding male, which scurried away and disappeared into a log. The larger male then returned to "his" female at which time there commenced a head-bobbing display between the male and female. This display lasted several seconds before they settled down into a basking posture on the wooden bridge approximately 30 cm apart from each other.

While there has been considerable research on closely-related sister species (Eualamprus quoyii, E. tympanum: e.g. Schwarzkopf & Shine, 1991; Schwarzkopf, 1993, 1996; Blomberg, 1994; Doughty & Shine, 1997, 1998), there have been relatively few studies of E. heatwolei. Indeed, ours may be the first published description of copulation in Eualamprus spp. in general. Although recent work by Head et al. (2005) investigated courtship and sexual receptivity in E. heatwolei, this work was conducted under laboratory conditions. Head et al.'s (2005) data show that female E. heatwolei are only receptive for approximately 7 days in late October (in the laboratory). Our observation of courtship and copulation in free-ranging lizards on 30 October is consistent with their laboratory findings.

Additionally, our observation of the larger (resident?) male chasing the smaller (floater?) male from the vicinity of "his" female suggests mate defence in this species. A recent study by Morrison et al. (2005) used molecular techniques to determine paternity in a natural population of E. heatwolei, and suggested that this species has a multiple mating polygynous mating system. They also observed males chasing other males and sub-adults in close proximity, as well as male-male combat bouts in the field. However, Morrison et al. (2005) did not report mate-guarding in E. heatwolei. Morrison et al. (2005) found that a single male can overlap several female home ranges, but also that there is multiple paternity in litters. If a female is only receptive for a short time, it might make sense for a male to guard his harem of females to ensure paternity. However, the multiple paternity documented by Morrison et al. (2005) suggests that the floater males may get their chance...
while the territory holders are away visiting other female home ranges. The extremely short period of female receptivity in this species (Head et al., 2005), and our observation of the larger male defending “his” female against a rival male, suggest that the possibility of mate guarding warrants further research in this species.

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REFERENCES


**Figure 1.** Copulation in a pair of southern water skinks.