

# Grey snake

## *Hemiaspis damelii*

Endangered (*Nature Conservation Act 1992*) | Ecological Sciences, Queensland Herbarium

### Identification

Uniform olive-grey to grey above and their belly surfaces are white to cream or yellowish, usually flecked with dark grey (Wilson and Swan 2010; Hobson 2012). The top of the head and the first few scale rows are black in juveniles. This dark patch reduces to a narrow bar in adults, or sometimes may disappear completely. They have large eyes and can grow to a total length of about 60 cm (Cogger 2000; Wilson and Swan 2010).

*Hemiaspis damelii* may be confused with juvenile eastern brown snake *Pseudonaja textilis*. The two species can be distinguished by *H. damelii* having larger eyes, single subcaudal scales and no dark bands along its body (juvenile *P. textilis* often have this feature) (Wilson and Swan 2010).

### Distribution

Distributed throughout the eastern interior, from central inland New South Wales, north to coastal areas near Rockhampton in Queensland (Cogger 2000; Hobson 2003; Wilson and Swan 2010; Hobson 2012).

Within Queensland, records are known from near Goondiwindi and the adjacent Darling-Riverine Plain, from the Darling Downs and from the Lockyer Valley. The core area for the grey snake in the Brigalow Belt is south of the Great Dividing Range between Dalby and Glenmorgan (Hobson 2003; 2012).

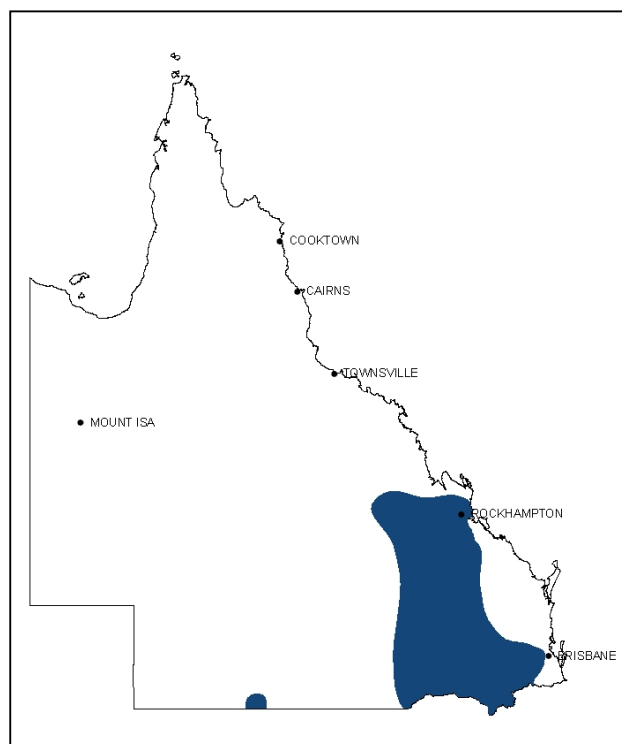
A single reliable record (captured, no specimen collected) is known from Currawinya National Park in western Queensland (WildNet 2012).

### Habitat

*Hemiaspis damelii* favours woodlands (typically brigalow *Acacia harpophylla* and *belah Casuarina cristata*), usually on heavier, cracking clay soils, particularly in association with water bodies or in areas with small gullies and ditches (gilgais) (Wilson and Swan 2010; Hobson 2012).



Photo by Ben Nottidge



The species is known to shelter under rocks, logs and flood debris, as well as in soil cracks or abandoned burrows within these moist/seasonally inundated habitats (Cogger 2000; Hobson 2003; Wilson and Swan 2010; Hobson 2012).

## Seasonal and timing considerations

As *H. damelii* feeds almost exclusively on frogs, surveys targeting this species should be conducted during the spring/summer months, when frogs are most active (Shine 1987). Nocturnal searches should be undertaken during the first four hours after dusk and preferably after heavy rainfall events (e.g. enough rainfall to inundate soil cracks and gilgais) (DSEWPaC 2011). In addition, to increase the likelihood of detection, surveys should also target the breeding period (January to March) of this species when activity levels are likely to be higher (Hobson 2012).

## Recommended survey approach

The following survey techniques are all likely to yield low capture rates. Thus, we recommend passive nocturnal searches and vehicle transects be given priority when targeting *H. damelii* as extensive trapping arrays are required in addition to those on the generic survey sites (see Eyre et al. 2012).

### Passive nocturnal search

*Hemiaspis damelii* is most likely to be encountered by searching around suitable cracking clay and gilgai habitat during optimal conditions, using headtorches and spotlights with a bright focussed beam. Suitable microhabitat features should be thoroughly scanned such as fallen logs, vegetation in and around water bodies (wetlands), soil cracks and rocks (DSEWPaC 2011).

### Nocturnal vehicle transect

Nocturnal vehicle transects should be conducted on roads and well maintained tracks with limited vegetation and debris, and on warm humid nights where roads/tracks bisect suitable habitat. Transects should be repeated multiple times over the same section(s) of road, where possible.

Drive at a constant speed (~10 km/hr) with the driver and front passenger scanning the road for any animals crossing or basking (reptiles will often take advantage of the warmth from the road surface). When an animal is detected stop the vehicle and identify the species. Transect width, visibility (e.g. rain, road conditions), constant speed and time taken to drive the transect should be recorded (see datasheet for further variables, Eyre et al. 2012).

### Active diurnal search

Diurnal searches for this species should target sheltering sites and microhabitat features (rocks, logs or other large objects on the ground) in or adjacent to suitable habitat. Under optimal conditions, searches are best conducted between mid-morning and mid-afternoon. Keep in mind the optimal time of day and day within the survey period, to conduct active diurnal searches depends heavily on season and weather conditions on adjacent days.

### Pitfall and funnel trapping

Pitfall and funnel trapping could be used in addition to active searches and nocturnal vehicle transects. For this technique large amounts of effort, in terms of total trap nights (e.g. > 50 pitfall and 50 funnel trap nights per ha), will need to be invested. This requires either high numbers of traps or extended trapping periods to detect this species.

Trapping arrays should be established in or adjacent to cracking clay/gilgai habitat to maximise capture success in optimal conditions (i.e. trapping after rainfall events).

## Survey effort guide

There is no published information on detection or capture rates for *H. damelii*.

Thus, the recommended level of effort outlined below may provide reasonable opportunities to detect or capture this species during optimal survey conditions. However, based on the precautionary principle, if it is not feasible to invest this quantity of survey effort, with suitable habitat present in the survey area, then *H. damelii* should be assumed to be present.

### Minimum effort within suitable habitat during optimal conditions

Survey technique	Effort per survey period	Effort per survey	Number of survey periods
Passive nocturnal search (100 m x 100 m plot)	60 minutes per plot, 2 plots per 5 ha or 3 plots if < 5 ha	Two 30 person-minute searches	2 surveys
Nocturnal vehicle transect	~250 km (or all suitable roads surveyed multiple times)	Spread over 2 nights	2 surveys
Active diurnal searches (50 m x 50 m plot)	60 minutes per plot, 2 plots per 5 ha or 3 plots if < 5 ha	Two 30 person-minute searches	2 surveys

e.g. Active searches of 30 minutes (1 person) or 15 minutes (2 people) per survey site within the survey period.

## Ethical and handling considerations

### General

- Bites from *H. damelii* have the potential to cause severe symptoms, and as such, should be handled only by trained and competent personnel.
- Holding animals should be avoided, but if necessary, place snake into a dry calico bag inside another dry, clearly labelled calico bag and make sure that the ends of both bags are tied and secure. One snake per double-bagging (i.e. bag inside another bag). Keep bagged snakes cool and out of direct sunlight (e.g. placed inside an esky or bucket with lid firmly on).
- Any captured animals should be released at the site of capture as soon as possible after identification.

### Searches

- Always replace habitat to the best of your ability, such as re-rolling rocks and logs back into place. This is particularly important in fragmented habitats or isolated patches.
- Every attempt should be made to keep damage from active searches to a minimum.

- Avoid prolonged exposure of animals to the spotlight beam. For longer observation periods, dim the light or use an infrared beam or a red filter.

## Trapping

- Traps must be thoroughly checked early in the morning before temperatures become too hot.
- Provide shelter in the bottom of the buckets and over the top of funnel traps to reduce predation and exposure (heat, cold and dehydration) of trapped animals. For funnel traps, we recommend at least 70 % shade-cloth however silver roof insulation or dense vegetation are alternatives. Dehydration can be a problem, especially for amphibians, when humidity is low. Using vegetation cover or moistening the soil under the funnel/moistening the soil in the bucket can reduce this risk.
- Floats should be added to the bottom of buckets (e.g. piece of closed cell foam or cork) to reduce the risk of drowning from unexpected rain or storms. Buckets must be closed if they begin to fill with water and should not be reopened until the risk of drowning has passed.
- Ants preying on trapped animals can be a problem so locate traps away from obvious ant nests and be vigilant for ant activity. If they become a problem (e.g. they are attacking captured animals) and can not be controlled the traps should be immediately closed.
- Take care when checking funnel traps as they may trap venomous animals; personnel should be trained in the removal of venomous snakes.
- Consider weed and pathogen spread when using equipment in multiple locations as these can be transported via dirty equipment.

## Acknowledgements

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## Citation

Rowland, J. 2012. Grey snake, *Hemiaspis damelii*. Targeted species survey guidelines. Queensland Herbarium, Department of Environment and Science, Brisbane.

## Key references

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