



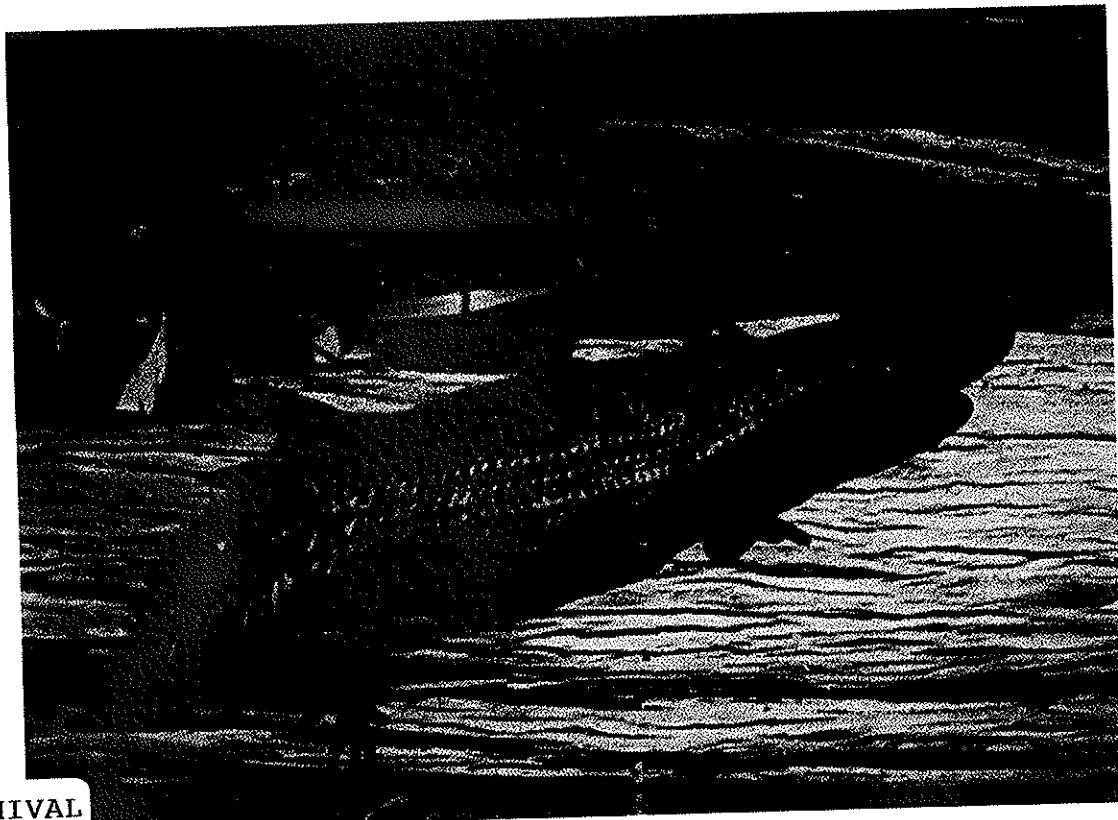
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REPORT ON THE PROJECT

**Assessment of the central wheatbelt
populations of the endangered skink,
*Egernia stokesii badia***

by

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Background

The Spiny-tailed Skink or Gidgee Skink, *Egernia stokesii* (Gray 1845), has a number of geographically separate and morphologically distinct populations that are currently listed at subspecific level. The two most distinctive forms are *E. s. stokesii* from the Pelsart and Wallaby Groups, Houtman Abrolhos, and *E. s. badia* (Storr 1978) from the central wheatbelt and central Carnarvon Basin. The race *E. s. aethiops* (Storr 1978), described from Baudin Island in the Freycinet Estuary, appears most closely related to the nominate *E. s. stokesii*. Recent collections of the species in the Shark Bay region indicate that a similar, if not identical, population to *E. s. aethiops* occurs on Dirk Hartog Island and Peron Peninsula. One specimen collected from Woolgerong Rock lies well inland of all other records and is also an unusually dark individual. A similar individual has also been sighted at a breakaway 4 km east of Yalgoo (G. Harold pers. comm.). These may represent yet another regionally distinct form of *E. stokesii*.

While the island populations of *E. s. stokesii* remain numerous within their restricted ranges, the mainland *E. s. badia* has clearly suffered a major decline over the past century as a consequence of land clearance, especially in the central wheatbelt. The WA Museum has specimens from 28 localities in this region, of which 15 were recorded prior to 1960, eight during the 1960s, four during the 1970s and one during the 1980s. The species was encountered on only one reserve out of 23 surveyed by the Museum during the 1970s. Over the last decade, one definite sighting has occurred in the central wheatbelt region – an adult in a small reserve near Mullewa (B. Maryan pers. comm.). The central Carnarvon Basin population is poorly known, with only two definite localities (Callagiddy and Woodleigh Stations). The species was not encountered during the Carnarvon Basin Biological Survey during 1995-1996 but, subsequently, has been seen on Woodleigh Station (B. Maryan pers. comm.). This northern population of *E. s. badia* may well be disjunct from that in the wheatbelt.

The location of all collecting sites of *E. s. badia* specimens in the WA Museum collection are presented in Figure 1 together with the distribution of specimens from the other two races of *E. stokesii* (*E. s. stokesii*, *E. s. aethiops*) and the unusual Woolgerong Rock form in Western Australia.

The described distribution of *E. s. badia* is focussed on the central wheatbelt with two outlying localities in the Carnarvon Basin region. All of the 28 locations where *E. s. badia* has been recorded from in the central wheatbelt (except Rothsay) lie within the "Avon wheatbelt" IBRA bioregion of Western Australia (Thackway and Cresswell 1995). The majority of these collecting locations are from reserves associated with the railway sidings established to handle harvested grain crops.

Data presented in Figure 1 indicate that there has been a marked decline in the number of specimens accessioned into the collections of the Western Australian Museum over the past forty years. This fact, coupled with the large scale clearance of vegetation in the region in the past forty years, has raised concern as to the long term survival of the subspecies in the central area of its distribution and led to its listing as an endangered taxon (WA Government Gazette, 28 November 1997).

Caron, south of Perenjori, with six specimens has provided the greatest number of individuals in the collection of the WA Museum while numerous other locations in the wheatbelt have been the source of one or more specimens.

The biology of *E. stokesii* is not well understood with literature reports mentioning their occurrence in small groups, the production of live young and their preferences for hollow logs and rocky outcrops where they are active during the day (Greer 1989). Of particular significance, however, is the behaviour of this species in depositing faecal droppings outside their refuges (Cogger 1992, Wilson and Knowles 1995, Greer 1989). This behaviour has also been noted in the closely related *E. depressa* by one of us (JD) and the behaviour has been used to determine species presence during faunal surveys. It is also very likely that individual *E. stokesii* have a potential longevity in the order of several decades.

Objectives

The objectives of the current project were:

- to assess the current status of *Egernia stokesii badia* in the central wheatbelt region
- to collect material for a molecular evaluation of the systematics of the *Egernia stokesii* complex
- to raise local community awareness of the species decline and its habitat requirements.

Methodology

The former distribution of *E. s. badia* has been investigated through consideration of all known collecting localities in museum collections and unpublished literature.

Information on surviving populations of *E. s. badia* has been sought from members of the community through approaches to both amateur herpetologists and local farmers.

Field surveys have been undertaken to assess the current status of *E. s. badia* within the central wheatbelt region, focussing on previously known collecting localities and any major unsampled reserves within the species' core distribution area.

Results

Field Survey Results

A five day field survey covering over 2000 km was undertaken in mid January 1998 to determine the current status of *E. s. badia* populations in the central northern wheatbelt of Western Australia. Locations within the Shires of Three Springs, Carnamah, Perenjori, Morawa, Coorow, Moora and Dallwallinu were examined. A second survey was undertaken in April 1998 by amateur herpetologists, Dave Robinson, Brad Maryan and Bruce George, which examined locations within the Yalgoo-Mt Magnet area, including Woolgerong Rock. It is proposed to visit suitable and previous collecting localities within the shires of Wongan-Ballidu and Koorda in the spring with the support of the WH and M Butler fund.

The distribution of locations examined to date for *E. s. badia* are presented in Figure 2 with presence of the species denoted by closed circles and a suspected absence by open circles.

January 1998

Over thirty locations (Figure 2) were surveyed in January to determine the presence or otherwise of the species using the criteria of faecal piles outside hollow refugia or actual observation of individuals. The sites surveyed were from south of Wubin to north of Morawa and east as far as Koolanooka Spring, Rothsay and the Great Northern Highway.

A detailed two hour survey of all the remaining York Gum (*Eucalyptus loxophloeba*) woodland and logs on Caron siding water reserve (c. 400 ha) failed to document the species persistence at this location even though it was the source of the greatest number of Museum specimens. It is also unlikely that the species persists on Bunjil reserve as no York Gum woodland remains in the vicinity of the siding. The majority of sidings on the Coorow - Three Springs railway line no longer have significant bushland associated with them and consequently no habitat is available for the persistence of *E. s. badia* populations.

In 1972 a Western Australian Museum survey team documented the presence of this species on Buntine Nature Reserve (No. 26837) while an earlier specimen from Buntine was collected in 1953. This Nature Reserve was re-examined in January 1998 and a single individual [R132101] was captured in a hollow Gimlet (*Eucalyptus salubris*) log at the 1972 capture locality (Loc 1.5, Kitchener *et al.* 1979). A further hour long survey at this site revealed 6 other logs or log piles in Gimlet/Salmon Gum (*E. salmonophloia*) woodland with recent faecal deposits associated. It appears that a healthy population persists at this location on Buntine Reserve.

Two other individuals were collected during the survey, one [R132102] from a large log in York Gum woodland on Bowgada Nature Reserve and the other [R132048] from under disused sleepers in the Perenjori township. In addition, four individuals were marked and released from the latter colony under a woodpile in the backyard of a house at Perenjori. The terminal digits of toes from these marked individuals will be used for a DNA determination of systematic relationships. All these individuals will be principal in evaluating the systematics of the *E. stokesii* group.

The mummified skeleton of a hatchling *E. s. badia* [R132109] was collected from under logs in York Gum woodlands south of Rothsay, while another mummy of a large adult [R132108] was obtained from under a York Gum log adjacent to an abandoned farm house east of Morawa on the Yalgoo road. Skeletal remains of *E. s. badia* were collected from two faecal piles in York Gum woodlands; one east of the wheatbelt and the other from a remnant in a wheat paddock east of Wubin. The captive colony of *E. s. badia* maintained at the Perth Zoo were all derived from a colony in an abandoned house just south of Perenjori (Russell Trehair, Perth Zoo, pers. comm.).

April 1998

A four day survey of woodlands and rocky outcrops north of Morawa and into the Mt Magnet Shire was undertaken to follow up locations of both normally patterned and 'melanic' *E. s. badia*. This survey failed to locate previously documented 'melanic' populations of the species from a breakaway 4 km east of Yalgoo and at Woolgerong Rock (G. Harold pers. comm.). Ten other locations were also examined but failed to document signs or sightings of *E. s. badia*.

Dave Robinson, currently with Ag West, has conducted several private surveys around Perenjori and Morawa Shires in search of further locations with extant populations of *E. s. badia*. Numerous farmers in these shires are aware of the species and report its occurrence in sheds or woodlands on their properties.

Surviving Populations

The collection of individuals or skeletons of *E. s. badia* from Buntine Nature Reserve, Bowgada Nature Reserve, Perenjori town and in York Gum woodland south of Rothsay and northeast of Morawa indicate the species is still located over a large part of its known range in the central northern wheatbelt. Similarly, the recording of recent faecal piles adjacent to refuges in hollow logs at a further 10 *Eucalyptus* woodland sites as far east as Kalannie indicates that active colonies persist at numerous locations throughout the range of *E. s. badia*.

All of the sites where *E. s. badia* was recorded in January 1998 confirmed the assertions by previous authors that one of the species' preferred habitats was hollow logs.

Most of the occupied sites were in York Gum woodland, although some were also in Gimlet and Salmon Gum woodlands. In all of the woodland sites surveyed the species occurred only where there were considerable numbers of large fallen logs. Preferences appeared to be for log piles with several overlapping hollow logs provided numerous openings as well as cover.

Assessment of the size and number of pellets in faecal deposits indicated that the populations with the greatest number of individuals were those associated with areas where suitable logs were abundant and grazing by domestic stock was least. Dispersal of young between logs may be disrupted by the presence of cattle or sheep, such that the long-term survival of populations in grazed woodlands may not be assured.

Two traverses east of Perenjori, through wheatfields into uncleared land, indicated that *E. s. badia* can persist in very small remnants of York Gum woodland surrounded by shrublands. The species persists in woodlands as small as 1 ha, although several other small (< 5 ha) patches failed to show evidence of their persistence. York Gum woodlands surrounded by wheatfields also retained populations of *E. s. badia*. Farms in the Perenjori shire retain populations of *E. s. badia* in old abandoned farmhouses, sheds and woodpiles (D. Robinson pers. comm.).

The continued persistence of the species in York Gum woodlands represents the species best prospects of survival over its former range. Reintroduction to sites where the species occurred previously is a feasible proposition. Populations occupying "threatened localities" (abandoned buildings, farm sheds etc.) could be translocated providing suitable habitat (eg old hollow logs) is established at translocation sites.

The discovery of *E. s. badia* populations in York Gum woodland east of the cereal growing areas is of major conservation significance. This is an extension of the previously known distribution into the Yalgoo IBRA region. It is also significant that a 'melanic' form of *E. s. badia* is distributionally disjunct from the normal form and occupies rock outcrops.

Systematics

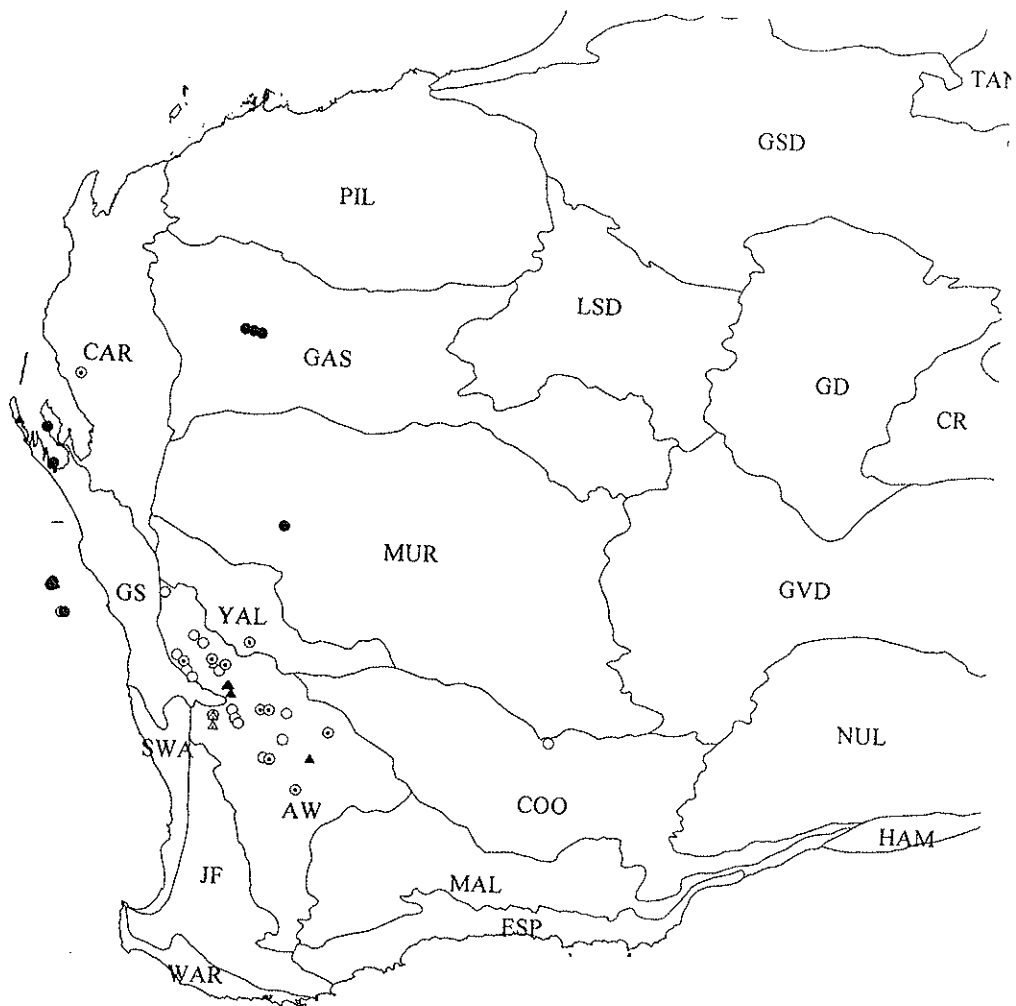
New material has been obtained from several populations of *E. s. badia* from the central northern wheatbelt. This material will supplement that already acquired of *E. s. aethiops* from Baudin Island and the material of the nominate race *E. s. stokesii* from the Houtman Abrolhos that is still to be acquired. It is envisaged that by the end of the year a genetic evaluation of *E. stokesii* will be complete. This may be followed up by a DNA evaluation if appropriate.

Further Field Surveys and Reporting

It is intended to finalise the survey of previously occupied localities of *E. s. badia* by conducting a field survey of areas in the Wongan-Ballidu and Koorda shires in September. This survey will be funded by a grant from the resources of the WH and M Butler Fund and a final report will be submitted at its completion. The information provided by Dave Robinson in his surveys of areas around Perenjori is being used to constantly update the distribution and biological data of the species in the core of its range.

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Stokesi.dbf

- △ 1913 - 1925
- 1926 - 1950
- △ 1951 - 1960
- ⊙ 1961 - 1970
- ▲ 1971 - 1980
- 1981 - 1992

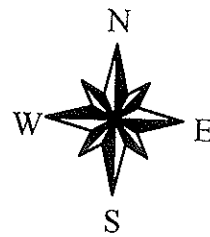


Figure 1

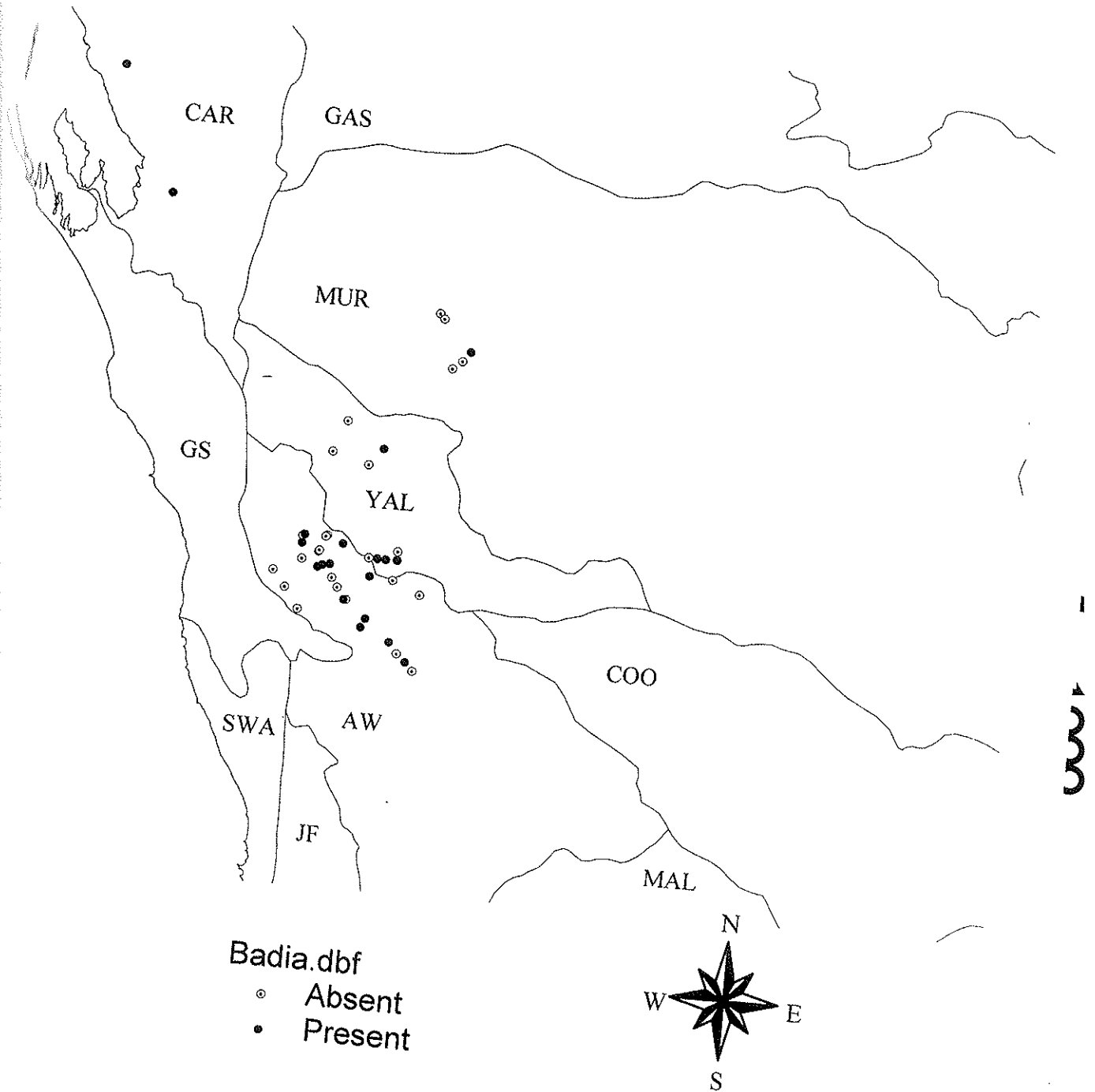
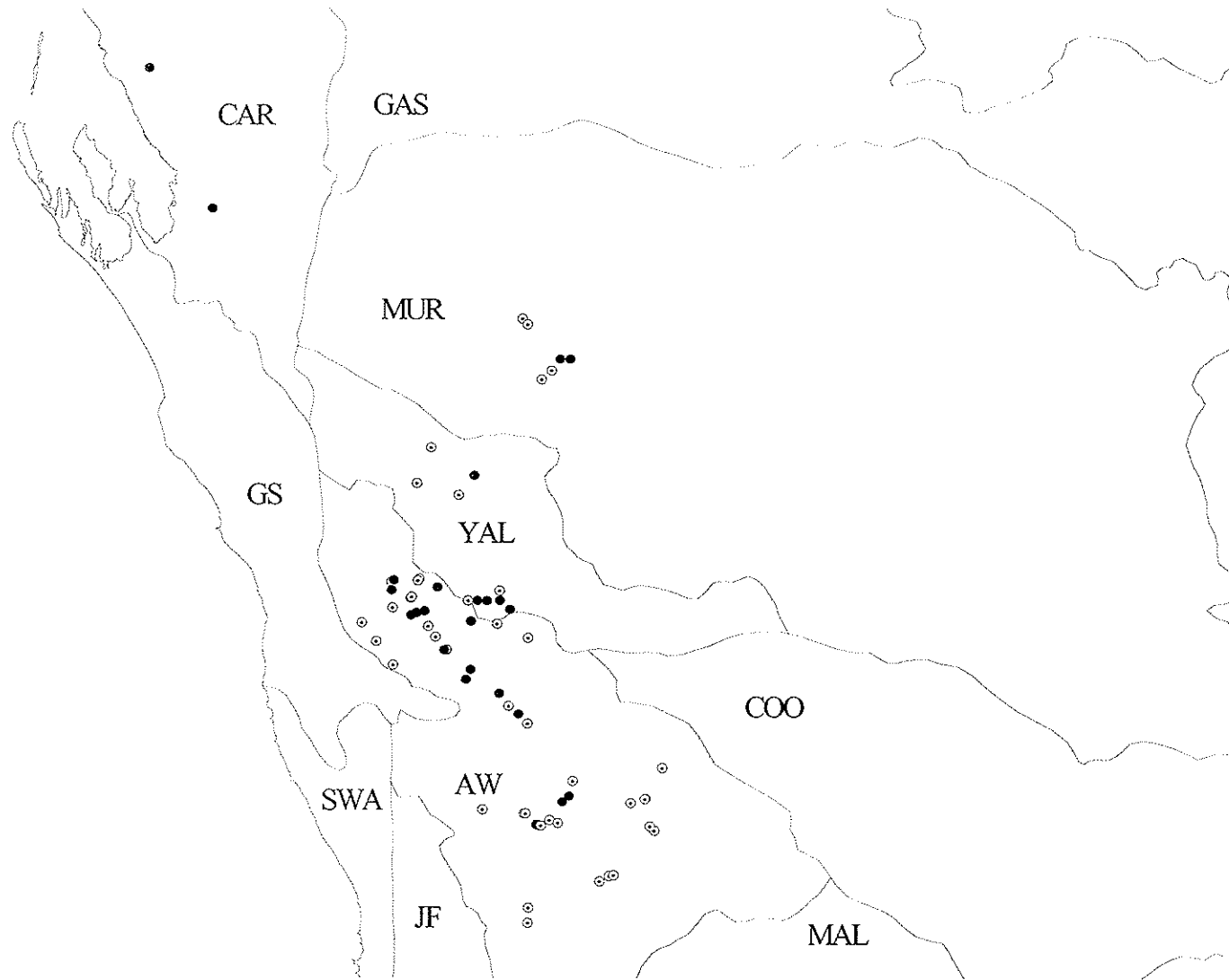


Figure 2

E. s. badia locations - Jan 1999



Badia.dbf
○ Absent
● Present

