LERISTA ALLANAE (SCINCIDAE: LYGOSOMINAE): 60 YEARS FROM EXHIBITION TO EXTINCTION?

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Lerista allanae (Longman, 1937) is known from 12 specimens collected between 1929 and 1960, from 3 localities (Retro, Logan Downs and Clermont), in a small section of Queensland's central Brigalow Biogeographic Region. The species is/was confined to 'black soil' downs. The area from which *L.allanae* is known has undergone dramatic change since first settlement; it is now farmed or grazed, so little natural vegetation remains.Many searches by specialists have failed to find *L.allanae*. We conclude that *L.allanae* may be extinct, while acknowledging that this is impossible to prove. If it is not extinct, *L.allanae* is critically endangered. Despite its 'obscurity', the possible extinction/endangered status of *L.allanae* is a matter of concern, notwithstanding the extremely high economic value of agriculture in the Brigalow Biogeographic Region. The apparent demise of *L.allanae* may herald loss of other reptile species.

We recommend seeking the co-operation of land holders to protect remnants of natural vegetation in its range; recognising the vital importance of remaining natural grasslands like Gemini National Park; implementing a pit-trapping programme to increase the chance of re-locating the species; and examining the need to protect, at least, the type localities of Brigalow Biogeographic Region species where they still occur. □*Lerista allanae, extinction, endangered species, Brigalow Biogeographic Region.*

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Lerista allanae (Longman, 1937) is a burrowing skink from a small area of Queensland's black soil downs in the Central Brigalow Biogeographic Region. It is known only to taxonomists, and has been collected by, at most, a handful of people, between 1929 and 1960. No photographs are known of *L.allanae* in life.

Thirteen museum specimens comprise the total knowledge base of this species, one of 11 species of Australian reptiles recognised as 'endangered' (Cogger et al., 1993).

SPECIMEN HISTORY

The 13 specimens of *L.allanae* were collected in 3 localities, all in close proximity to one another, in the undulating downs (= gently undulating plains formed on Tertiary basalt, Permian shales, sandstone and unconsolidated sediments of the Oxford Land System) of the central Brigalow Biogeographic Region (J. McCosker pers. comm.): '20 miles W of Capella' = Retro Station 22°51'53"S 147°53'43"E*, Aug. 1929+, J.R. Slevin, (AMR13819); 6 Aug. 1929, J.R. Slevin, (CAS77101, 'missing' 14 Feb, 1988); 12 Dec, 1936, J.R. Slevin, (CAS77099); 13 Aug, 1929, J.R. Slevin (CAS77100); Retro Station, Sept, 1936-Nov 1937, Maida (Mrs Percy C.) Allan, (QMJ6180 holotype, QMJ6040, QMJ6179 paratypes, QMJ6238, QMJ6308, QMJ6429, QMJ6430); Logan Downs approx. 22°25'S 147°55'E, 16 Nov, 1948+, H.Womersley, (SAMR2823); Clermont 22°50'S 147°38'E, Jan, 1960+, C.Vallis (QMJ12232), (Couper & Ingram, 1992; Cogger et al., 1993; Shea, 1993; Covacevich & Couper, 1994; J.V. Vindum, pers. comm).

Heber Longman described *Rhodona allanae*, naming it for the collector of the first specimens sent to him. However, nearly a decade earlier, J.R. Slevin from the California Academy of Sciences, had collected specimens of this species.

This material, from '20 miles W of Capella' (=Retro Station) was not included by Longman

*(Latitude and longitude calculated at Retro homestead, in the absence of precise data on collection locality/ies.
+Date of registration, unless identified as a date of collection. Registration occurs soon after collection, generally.

in his type series. Longman's types (Covacevich & Couper, 1994) were sent to him by Mrs Percy (Maida) Allan, wife of the manager of Retro. The correspondence between Longman and Mrs Allan (Queensland Museum Archives) is a lively record of his excitement at 'the find' on Retro, and her keen interest in natural history. It also sheds some light on the colour of *L.allanae* and on its habitat preferences. (e.g. '...an elongated, *grey, dark - spotted skink*'... in litt., H. Longman to Mrs P.C. Allan, 20 May, 1936; 'This is a *very rare* and interesting lizard, and I hope that other specimens can be obtained and forwarded. It is the first of this particular kind to be obtained in Queensland, and it is probably new to science... in litt., Longman-Allan 10 Sept., 1936; '...In this lot of lizards there is a very good specimen of the elongated one, the 'Retro' lizard, *they are not easy to find*, but have asked the man who brings in new soil for garden to keep a lookout as *they seem to be down a few inches in black soil under tussocks of grass and so far we have had four from that one patch.* ...' in litt., M. Allan to Heber Longman, 18 June, 1937; '... I was particularly pleased to have two additional specimens of the elongated *grey, dark-spotted skink* lizards. These will probably be described as new in the next number of our Memoirs. They are allied in some respects to a North Queensland species named after Sir Hubert Wilkins, and to a West Australian species. Congratulations on this discovery. ...' in litt., Longman to Allan 20 May, 1937).

Longman was keen to exhibit the new reptile. ...'As the type and two paratypes should be preserved downstairs to avoid fading, as far as possible, I hope that you will be able to find other specimens for exhibition and for exchange with one or two other museums.' ... (in litt., Longman to Allan, 18 June, 1937). Specimen QMJ6238, registered 28 June, 1937, was placed on display in the galleries of the Queensland Museum, presumably soon after registration. It was removed from exhibition, faded, but otherwise in good condition, on 18 Aug., 1954.

Data from the registers, correspondence and literature on the habitat of *L.allanae* are scant. Slevin's (1955) description of Retro, from his visit there in 1929 and 1936, '... open grasslands and scattered gum trees with moderately heavy groves of tea tree and an occasional bottle tree. Both black and red soil are in evidence. Though the surrounding country did not look attractive as a collecting ground it proved to be excellent, with a large number of species.' ...; and Mrs Allan's description of the skink's association with 'tussocks of grass' and being found 'down a few inches in black soil' are all that is known. That four specimens of the 10 known from Retro came from 'one patch', that only 12 have been lodged in museums, and that both Longman and Mrs Allan allude to its 'scarcity' suggest that *L.allanae* may have been always both 'rare' and highly-localized in the black soil downs of the Capella-Clermont area. These data also suggest that the species was difficult to find. The exact collection site for these specimens was not referred to in Longman's description of *L.allanae* (1937), and exact collection sites for the specimens from Logan Downs and Clermont also are imprecise and devoid of habitat notes.

Slevin's collections in 1929 and 1936 suggest that *L. allanae* may have been scarce always. Slevin was a skilfull collector. California Academy of Science records show he collected 1200 reptile specimens of 33 species on his two field trips to Retro. Only three specimens of the then undescribed *L. allanae* were collected.

Reduction in size and intensification of land use on Retro have gone 'hand in hand', since the early 1920's. This pattern, now being implemented more quickly than ever on the central downs of the Brigalow Biogeographic Region, is not new for rich black soil downs in Qld. In southeastern Qld, similar pressures to increase farm production have resulted in dramatic changes in vertebrate and plant species diversity on the Darling Downs (Covacevich unpubl. data; Fensham pers. comm.).

L. ALLANAE VS *L. COLLIVERI*

The recent separation of *L. colliveri* Couper & Ingram, 1992 from *L. allanae* was based on what could be regarded as minor external differences. *Lerista colliveri* was described from 37 specimens which had been identified as *L. allanae*. These specimens account for distribution maps (Cogger, 1975, 1979, 1983, 1986, 1992; Ehmann, 1992; Wilson & Knowles, 1988) which suggest that *L. allanae* occurs beyond the Capella-Clermont area to the vicinity of Hughenden and the Townsville area.

With Couper & Ingram's (1992) separation of *L. colliveri*, *L. allanae* is again a narrowly-restricted species, which has not been reported or collected since 1960, despite many searches. Comparison of the recent redescription of *L. allanae* from the type specimens and of *L. colliveri* (Couper & Ingram, 1992) and the observations of Shea (1993) shows they differ in colour pattern

and in the number of long toe lamellae. In *L. colliveri* the forelimb varies from a nubbin to a style. *L. allanae* has no forelimb.

With these data in mind, we recognise that the differences between *L. allanae* and *L. colliveri* could be seen as too minor to warrant species recognition. If this were so, *L. colliveri* would be treated as a junior synonym of *L. allanae* and, as *colliveri* were collected relatively recently (1977-1985), some of the concern about *L. allanae* would abate.

However, separation of species within *Lerista* from only slight or even without external differences, has well established precedence. Characters used by Greer et al. (1983) to separate *L. cinerea*, *L. storri* and *L. vittata* from one other are also subtle.

In separating *L. emmotti* from *L. punctatovittata* Ingram et al., (1993) identified only one character as diagnostic, a didactyle forelimb vs a monodactyle forelimb or monostylus. Estimates of genetic distance derived from allozyme electrophoresis showed that the two 'forms' warranted recognition as distinct species, despite the fact that development of the toes in degenerate-limbed skinks is highly variable. In other genera also, subtle morphological differences have been used to support species delineations based essentially on allozyme variation (e.g. Daugherty et al., 1990a; Patterson & Daugherty, 1990). Regarding the *Oligosoma nigriplantare* species complex of New Zealand, Daugherty et al. (1990a) observed: 'A clear pattern of genetic and specific divergence is overlain by a highly variable pattern of color and morphological variation, often independent of species boundaries. ...' and that this frustrated traditional taxonomic methods. Another recent New Zealand example highlights the importance of examining the distinctness of *L. allanae* and *L. colliveri*. Daugherty et al. (1990b) analysed the conservation implications of recognising three taxa of tuatara, where only one had been known.

As *L. allanae* has not been collected since 1960, the possibility that genetic distance from *L. colliveri* can be determined from allozyme electrophoresis seems remote. However, given patterns elsewhere; that there are morphological differences between *L. allanae* and *L. colliveri*; and that the two are geographically isolated, we consider *L. allanae* distinct from *L. colliveri*. We also recognise the need for what might be termed 'taxonomic caution' in dealing with potentially endangered taxa; and that ... 'Taxonomies are not irrelevant abstractions, but essential foundations of conservation practice' (Daugherty et al., 1990b).

RETRO: SIZE AND LAND USE

Retro was established in or about 1861, from the amalgamation of a series of 'runs' in the Leichhardt Pastoral District. Initially, Retro included close to 400 km² (Queensland Department of Lands, 1866). By the 1880s it extended NE from the Capella-Clermont road, and straddled Retro Ck and its tributaries, (Queensland Department of Lands, 1884) (Fig.1). Through partition and sales, both as a result of government policy and market vagaries, Retro's size has diminished dramatically. By about 1920, a major section of Retro had been excised near the Clermont-Capella road (Queensland Department of Lands, ca. 1920); by the 1940s further excisions on the SE boundary near Abor Ck and on the NE boundary had been made (Queensland Department of Lands, circa 1940s a,b); by 1951, Retro had been reduced to c.72,000 acres (Queensland Department of Lands, 1951). Retro is now a holding of 2208.774 ha. Former 'Retro Station' now forms part of Dakota, Carramah, Meelia, Hazeldene, Weimby Downs, Mt Oscar, Salt Springs, Amatunga, Penaddi, and Grenada holdings (Alick, 1995, map 3).

Intensification and simplification have characterized land use on Retro. It was a sheep station originally. In 1891, 71000 sheep were shorn on the station (L.Vagg pers. comm.). On Retro, and on most other sheep holdings in the Capella area of the black soil central downs, sheep-grazing changed natural pastures to such an extent that 'new' grasses and weeds bearing seeds contaminated 'the clip' beyond use. This forced a change from sheep to cattle grazing in the area (J. McCosker, pers. comm.). Cattle grazing progressively gave way to mixed cattle and grain production, with the availability of machines to hasten clearing and improved grain markets in the 1940s-1950s. In 1951, Retro was held by The Queensland British Food Corporation, and was used primarily for grain production. In 1996, Retro is 'broadscale' farmed, with some irrigation, to produce sunflower seeds, mungbeans and sorghum.

There are no data on early vegetation on Retro, but from the early 1940s (soon after the Allan collections of *L.allanae*), detailed description of Retro's 'natural' vegetation is available. At that time, Retro was primarily a cattle station. The 'Retro Freehold Lands' map, Queensland

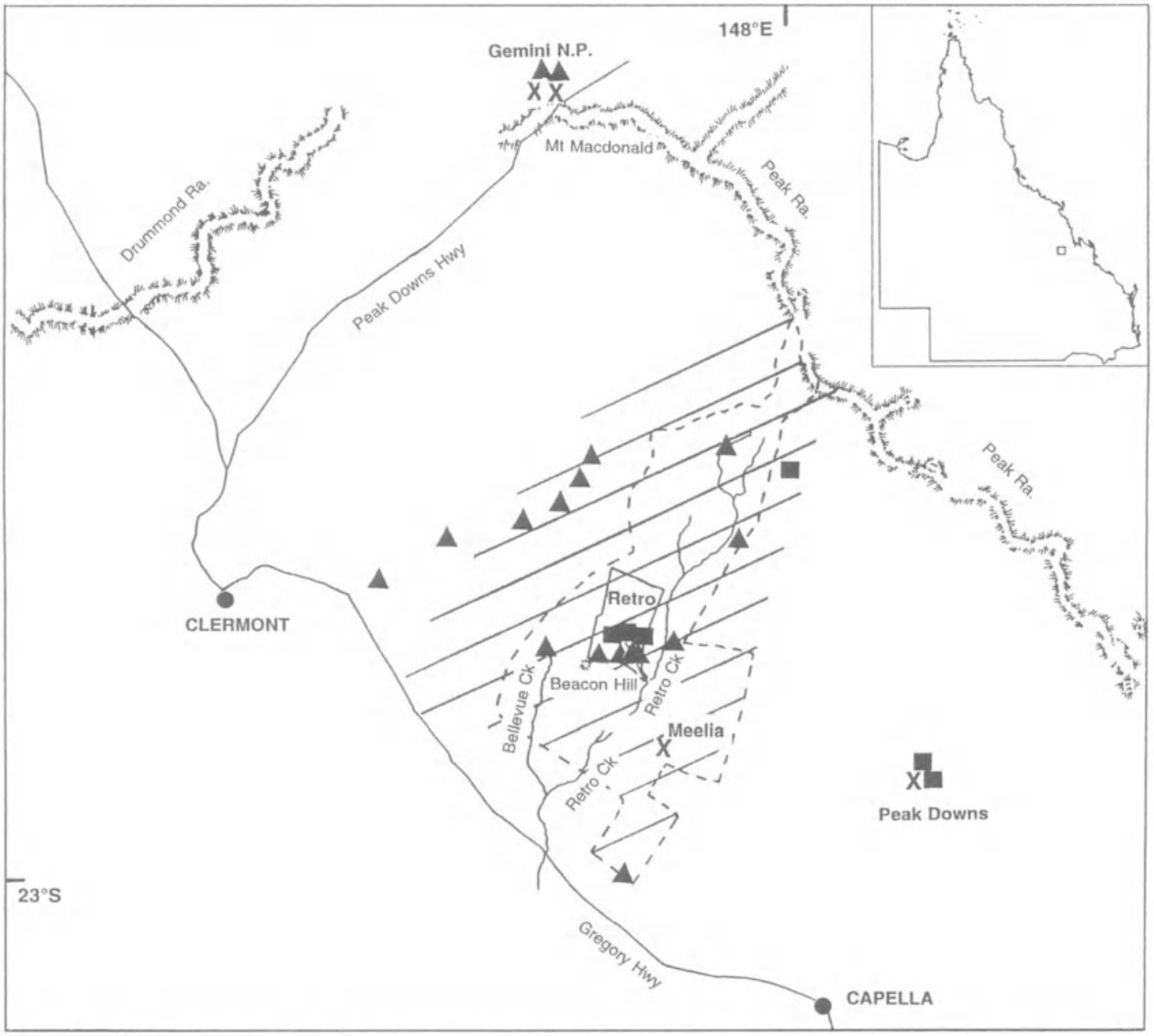

Fig. 1.Retro Station, the type locality of *Lerista allanae*, showing progressive size reduction since the 1860s. (///= approximate extent in the 1860s; ——- = boundary during the 1940s; — = boundary, 1995). Also shown are sites searched in attempts to locate *L. allanae* between 1970 and 1996. (hand collecting, 1970-1994 ■, 1995-1996 ▲; pit-trapping, 1995-1996 x). Two pit-traps and one hand-collecting site for 1996 are not shown. All are on Kevricia, 35km ESE of Capella. 1cm=4.8km.

Department of Lands, c. 1940s describes the country and vegetation from north to south in detail: 'Scattered timber and Stone, Stony Coolibah Ridges, Heavy Scrub with Stony Hills, Some Slope Gullies and Stone, Plain, Ti-tree, Scrubby and Gravelly Ridges, Plain with lightly scattered Bauhinia, Black Soil Fairly Heavy Scrub, Open Tableland Coolibah and Blood-wood, / Open Plain, inter alia' ... Only one tiny area near the homestead, now abandoned, but still standing (Fig.2) was cleared. This is described as 'Old Cultivation'. Retro contains no 'natural' vegetation save for islands of Poplar Box (*Eucalyptus populnea*) woodland with sparse shrub understorey and open Coolibah (*E. orgadophila*) woodlands. Buffle Grass (*Cenchrus ciliaris*), an introduced pasture grass, and the Parthenium weed (*Parthenium hysterophorus)* are common in areas not under crops.

SEARCHES FOR *L.ALLANAE,* 1968-1995

Between 1968 and 1995 there have been many attempts to find *L.allanae* on Retro, the area formerly part of 'old' Retro, and in 'suitable' habitats nearby. Other reptile specimens have been collected during searches aimed at establishing if *L. allanae* still occurs (Fig.1) . These

Fig. 2.The abandoned homestead Retro Station, a relic of the 19th century, where Maida Allan, who collected the type specimens of *L. allanae*, lived in the 1930s.

searches, which have intensified since 1992, have not been methodical in terms of either seasonal or habitat sampling. However, experienced collectors have searched the area in 'good' reptile times (summer and spring) many times. They have found other burrowing, secretive or elusive, small skinks (e.g. *Lerista fragilis, Anomalopus brevicollis, Glaphyromorphus punctulatus, Menetia greyii* and *M. timlowi*) in the area, but *L.allanae* has not been located. *Lerista* spp. and other burrowing skinks (e.g. *Anomalopus* spp.) are not usually collected by non-specialists. (Since 1985, 125 *Lerista* spp. have been added to Queensland Museum reference holdings. Only seven of these, i.e. 6%, were collected by people other than herpetologists. Numbers for *Anomalopus* spp. are similar, i.e. 8/62, 13%). It is, therefore, not surprising that, despite recent radio and newspaper publicity about *L.allanae*, no specimens have been collected 'accidentally' by 'amateurs'

The Longman-Mrs Allan correspondence had not been used as a basis for target-searching for *L.allanae* prior to 1995. Using Mrs Allan's descriptions; following consultations with Ms J. McCosker (of Department of Environment, Emerald) regarding soil and vegetation types, especially grasslands; using data from maps of 'old' Retro's boundaries; and bearing the Logan Downs and Clermont collection localities in mind, 4 sites were chosen for intensive *L.allanae* searches, both by hand and using pit traps. Pit-trapping is acknowledged widely to be a reliable way of sampling reptiles, including species often not found by hand- searching (Morton et al., 1988). Many types of fences, traps and designs of pit-traps have been used, with varying success rates. In an arid habitat, it has been shown that . . .'A simple straight line of pit-traps and a drift fence with buckets approximately 7m apart is the most effective . . .' (Hobbs et al., 1994). This method was adopted.

In Gemini National Park, 2 pit-traps lines of 12 buckets each were set at different times, early summer and late summer-early autumn. The first (22°30'25"S 147°51'06"E) was set from 15-21 Feb., 1995; the second (22°29'15" 147°52'14"), from 15-20 April, 1995. Gemini National Park is one of only three small national parks within 100km of Retro. Here, open grasslands, once extensive in the central Brigalow Biogeographic Region, have been protected from invasion by, or

deliberate replacement with, introduced grasses. This is the only such locality in the area. Gemini National Park supports Blue Grass (*Dichanthium sericeum*) Downs, with open-groved *Bauhinia hookeri*, and scattered *Eucalyptus* spp., on dry, cracking, self-mulching, red-black soils. The introduced weed (*Parthenium hysterophorus*) is common on its margins, but has not invaded areas where the native grass is dense. Gemini National Park lies about 30km NW of the former boundary of 'old' Retro. It adjoins Logan Downs, the locality from which the 1948 specimen of *L. allanae* was collected. (Surveys for *L. allanae* were not conducted on Logan Downs because permission to work there could not be obtained). On Meelia, between 21-26 April, 1995, a pit-trap line was set about 8km SE of the old homestead on Retro, at 22°57'12"S, 147°54'30"E. Meelia lies within the boundary of 'old' Retro Station. This site is one of the few, minute remnants of uncleared land remaining in the area. The pit-trap line was set in red-black, cracking clay soil with open-groved *B. hookeri* and some Blue Grass (*D. sericeum*). Much of Meelia has been cleared for, or modified by, cattle grazing but the pit-trap site is grazed only intermittently, and supports native vegetation. Two pit traps were set on Kevricia at 23°14'77"S, 148°16'71"E and 23°14'79"S, 148° 16'19"E between 12-16 Feb., 1996. The former (site 1) was set in a 30m wide strip of Brigalow forest on deep, black, cracking soils. It had not been cleared, but was disturbed by cattle and adjoined a ploughed paddock. The latter (site 2), an area of dense Brigalow regrowth, also grazed and trampled by cattle, had been cleared once, in 1981. Kevricia is some 60km from Retro. It was chosen for sampling because of its similarity to some of Retro's former vegetation and because of the scarcity of such habitats in the area. A pit-trap was also set at Peak Downs (22°56'29"S, 148°04'60"E), 12-16 Feb., 1996. This was set in cleared, grassed, black soil adjoining both the old and new homesteads. (Peak Downs was established in the same era as Retro and, like Retro which it once adjoined, has been divided into many small holdings. Like Retro also, Peak Downs was a significant early collecting locality for reptiles (Cogger et al., 1983).

Results of pit-trapping in these sites (Table 2) indicate that burrowing and cryptic reptile species still occur in the area from which *L. allanae* is known.

Further, Queensland Museum register provides a good record of incidental reptile collecting undertaken on and near Retro since 1968. Hand collections by Queensland Museum staff/colleagues have been made at the following localities (Fig.1): Gibson Downs (22°49'S, 148°12'E); Highland Plains (22°40'S, 148°08'E); 8km from Clermont on Clermont-Mackay road (22°45'S, 147°38'E); Gaylong, via Capella (22°46'S, 148°09'E); 500m ENE of old Corry turnoff (22°45'S, 148°02'); Glencoe Stn (23°08'S, 148°14'E); 8-10km E of Capella at Gregory Mine turnoff (22°58'S, 148°03'E); Retro (22°52'S, 147°54'E); 20km N of Capella on Clermont road (22°59'S, 147°51'E); 17km NW of Capella on Clermont road (23°00'S, 147°54'E); Gemini NP (22°30'25"S, 147°01' 51"E); Mazeppa NP (22°11'51"S, 147°18'48"E); Moonda Siding (22°59'52"S, 147°53'16"E); Peak Ra. NP (22°30'25"S, 147°01'51"E); Huntly Downs (22°52'35"S, 147°07'E); Prairie Stn (23°06'46"S, 147°47'36"E); Meelia (22°57'S, 147°54'); and Peak Downs (22°56'S, 148°04'E).

TABLE 2. Summary of results from six pit-trap lines set in 1995- 1996, at four locations close to Retro, in search of *L. allanae*.

Species	Gemini NP		Meelia	Kevricia		Peak Downs
	1	2	1	1	2	1
Gemmatophora nobbi				+		
Diplodactylus vittatus		+				
D. williamsi					+	
Geyhra catenata	+					
Heteronotia binoei				+	+	
Glaphyromorphus punctulatus	+		+	+		
Lerista fragilis	+			+		
Menetia greyii	+		+	+	+	+
M. timlowi	+					
Carlia pectoralis				+	+	

That *L. allanae* has not been found despite recent pit-trapping and many hand-collecting searches by specialists in the last 28 years does not mean it is extinct. However, as other burrowing species known only to specialists have been found, and as *L. allanae* has not, is reason for concern. It seems reasonable to suggest that, if *L. allanae* survives, the sites on Gemini National Park ('secure' under legislation); Meelia and Kevricia (both freehold) are potential refuges for the species.

L. ALLANAE, POSSIBLY EXTINCT?

Extinction is difficult, if not impossible, to prove. The case of *Tiliqua adelaidensis* parallels that of *L. allanae* in many ways. Both are known from narrowly-restricted localities which have been changed by grazing or farming; both were/are known from only very small series of specimens (20 *T. adelaidensis* vs 13 *L. allanae*); for both, many unsuccessful searches by experienced herpetologists have been undertaken; and both species are secretive. *T.adelaidensis* was classed as 'possibly extinct' or 'extinct' by many authorities (Ehmann, 1982, 1992; Burton et al., 1986; Cogger, 1992; Hutchinson, 1992a,b). On 14 Oct., 1992, 33 years after it had been seen last, a specimen of *T.adelaidensis* was found in the gut of a Brown Snake, *Pseudonaja textilis* (Armstrong & Reid, 1992).

The prospect that *L.allanae* will, like *T.adelaidensis,* be rediscovered is not good. *L.allanae* was collected/seen last in 1960. The three known localities for *L.allanae* have undergone dramatic change, including clearing of forests; replacement of native grasses with introduced species, some of which are aggressive weeds; the replacement of grazing with intensive farming; and heavy use of pesticides to combat insect pests, particularly locust. All will have reduced the species' chances of survival. Thus it does not seem unreasonable to regard *L.allanae* as possibly extinct. *L.allanae* is a secretive species, like all *Lerista* spp., and is unlikely to be collected by farmers or graziers, and sent to a museum for identification, if records for other *Lerista* spp. are any guide; it may have some unusual life habit that has assisted its survival in the face of what appear to be major assaults on its only known habitat; and it is possible that the only known habitat for *L.allanae* may not be its true stronghold. This review confirms that *L. allanae* is, at least, endangered. In any terms it needs urgent conservation attention. *L. allanae* 'fits' almost perfectly the definition of 'endangered' (Cogger et al., 1993): '... Taxa in danger of extinction and whose survival is unlikely if the causal factors continue to operate ... whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction. Also included are taxa that may now be extinct but have definitely been seen in the wild during the past 50 years and have not been subject to thorough searching'... .

So little data are available on *L.allanae* that its critical population level and habitat are unknown, but the area from which it was collected has been drastically altered. It may be extinct now, but has been seen in the last 50 years (last in 1960). It has been subject to many searches, including some that would be termed methodical, if not 'thorough'.

THE IMPORTANCE OF *L.ALLANAE*

If *L.allanae* is extinct, it is the first Australian reptile species to be so since European settlement. This species is neither visible nor 'appealing'. It has no charismatic quality. It has been seen by only a handful of people, and it is poorly known by even specialist naturalists and herpetologists. It has no special status in the area from which it was described.

The reasons usually proposed for striving to maintain biodiversity are that: extinction can disrupt an ecosystem and cause the demise of other species; reduced diversity makes the world less interesting; the present generation has a responsibility to leave a world of maximum diversity = quality, for future generations; we may want properties (e.g. drugs) from species; and species have intrinsic value and a 'right' to exist (Elliot, 1980). The possible extinction of *L. allanae* could not disrupt the modified central downs of the Brigalow Biogeographic Region or cause the extinction of other species. Its possible loss could not be said to diminish seriously the lives of future generations; and its extinction is unlikely to result in the loss of some magical compound for the betterment of mankind. The loss of *L.allanae* may, like the canary in a coal mine, be a warning. Being narrowly restricted, rare and from an area now intensely farmed and grazed, it may be an indicator that other Brigalow species are about to decline. Many other species either confined to or occurring mainly in the Brigalow Biogeographic Region, are already recognised as rare and vulnerable (McDonald et al., 1991), and the conservation status of other Brigalow reptile species is of concern (e.g. *Aspidites ramsayi* after Sadlier, 1994; Sadlier & Pressey, 1994; Covacevich & Couper, this memoir).

Much of Queensland's Brigalow Biogeographic Region is rich grazing and agricultural land. Much of it has already been modified extensively and few reserves have been set aside for the protection of Brigalow communities (e.g. Sattler & Webster, 1984; Gasteen,1985; Sattler, 1986; Davie et al., 1994). It is now well known that nothing, not even stringent habitat protec-

tion, guarantees species protection (e.g. frogs in high altitude rainforests of Queensland; Ingram & McDonald, 1993). However, the corollary seems to be true for the Retro-Clermont-Logan Downs Brigalow habitats. Clearing of native forests comes close to ensuring species loss.

Emerald 65km S of Retro, is the main commercial centre for the central downs. It '... is anticipating an economic boom which will triple the value of production in the area'... which '...has beef cattle, cotton farms, citrus orchards, wheat and sorghum ...(and) coalmines. The key is a $235 million dam ... on the Comet River to provide 1,300,000 megalitres of water for new coalmines and *agricultural expansion.*'... (italics ours), Hay (1995). In the face of such ambitious plans for economic benefits from increased development and clearing in the central downs, whether or not *L.allanae* survives can be seen as trivial. That one cost of such economic benefits could also be the extinction of additional reptile (and other) species, can be seen also as inevitable and trivial. If, however, the pursuit of an ideal - to maintain biodiversity - in the Brigalow Biogeographic Region is worthwhile, the current status of *L.allanae* is not trivial. Rather, it becomes a matter of concern, necessitating, at least, restriction of clearing in the area.

RECOMMENDATIONS

1.Recognise that, inherently, *L.allanae* is worth preserving, if it still exists.

2.Consult with landholders in the Retro-Logan Downs area to encourage their co-operation to protect/preserve remnant stands of native vegetation from cattle, clearing and pest plants.

3.Recognise that Gemini N.P. is the best refuge in which *L.allanae* may still survive. The particular importance of this small park should be recognised, and special effort be directed towards its management (e.g. protection from *Parthenium hysterophorus*, illicit grazing of cattle, fire).

4.Continue efforts, particularly through pit-trapping to locate *L. allanae*. Whether such efforts should be urgent, major, and involve substantial research money and time, is a matter for consideration by protection authorities (i.e. Queensland Department of Environment and the Australian Nature Conservation Agency).

5.Recognise that type localities and habitats of other narrowly restricted species in the Brigalow Biogeographic Region may be altered or threatened by continued development. Where species still occur at their type localities or in small pockets of what may always have been a narrow range and where these areas still support native vegetation, every effort should be made to protect these areas, *at least*, from clearing.

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