

1. <b>Family:</b>	Chelidae
2. <b>Scientific Name:</b>	<i>Elseya sp. nov.</i> (Namoi and Gwydir Rivers, NSW) [also appears in the literature as <i>Elseya sp. (Gwydir, aff. latisternum)</i> ]
3. <b>English Name:</b>	Namoi River Elseya

4. **Intraspecific taxa:** None. The species awaits formal description.

5. **Species survival status:** Vulnerable.

6. **Former distribution:** Not known to have differed from current distribution.

7. **Current distribution:** Headwaters of the Namoi and Gwydir Rivers, west of Armidale, northern New South Wales. Known localities for the species on the two watersheds are separated narrowly by the Nandewar Range and are between 700 and 800 m asl. The distribution of this species is poorly known and there have been two independent reports of specimens from the Macquarie Marshes (Arthur Georges, *in litt.*).

8. **Habitat:** Rivers. Found in shallow to deep pools flowing through granitic bedrock.

9. **Reasons for decline:** Not known to have declined (there have been no surveys of the populations) but probably vulnerable to a combination of factors including soil degradation, habitat clearance, and water pollution.

The land adjacent to the streams has been modified by activities associated with pastoralism, resulting in disturbance to the stream banks and associated vegetation. As a consequence the aquatic habitat of the tortoises is vulnerable to the effects of increased runoff, siltation and pollution. The changes in water quality are believed to be implicated in the high incidence of eye disease in the tortoise populations (John Cann, pers. comm.).

Should the occurrence of the species in the Macquarie Marshes be confirmed, additional threats would include altered water flow regimes in the Marshes and demand on surface waters for agriculture (Arthur Georges, *in litt.*).

10. **Conservation reserves on which species occurs:** None known.

10A. **Other conservation reserves where species might be expected to occur:** Warrabah NP, Watson's Creek NR.

11. **Other public land on which species occurs:** None known.

12. **Other land on which species occurs:** Retreat Station about 25 km west of Uralla, and private properties through which the following streams flow: Macdonald River (known also as Muluerindie Creek, a tributary of the Namoi River west of Uralla) and Roumalla Creek (a tributary of the Gwydir River in the vicinity of Kingstown about 40 km west of Armidale); potentially present on private properties on other upper tributaries of the Namoi and Gwydir Rivers.

13. **Is knowledge about species adequate for objectives and actions to be defined accurately?:** No.

13.1: Research is needed into the cause and extent of blindness and eye loss affecting populations of this species.

13.2: Ground surveys need to be conducted to determine the full geographic range of the species, its habitat preferences, and the extent of its occurrence in existing reserves.

13.3: Research is needed into the basic biology and ecology of the species in the field including long term monitoring of changes in population size, habitat use and geographic range of the species.

13.4: Research is needed to determine if the species is declining and if so, to determine whether eye disease is contributing to that decline and to identify any other major factors causing decline.

14. **Recovery Plan objectives:**

14.1: To reduce the level of eye disease in the populations.

14.2: To obtain sufficient information on the

- species' biology, ecology and distribution to determine its current conservation status and formulate appropriate management strategies.
- 14.3: To ensure that secure, viable populations of the species are maintained within a reserve system.
- 14.4: To implement land management practices which promote the maintenance of secure, viable populations of the species outside reserves.
- 15. Management actions already initiated:**  
None known.
- 16. Management actions required:**
- 16.1: Identify and treat eye disease affecting populations and attempt to determine cause.
- 16.2: Survey known and potential habitat in reserves within the species' known range.
- 16.3: Survey known habitat outside reserves within the species' known range.
- 16.4: Establish aquatic reserves (including adjacent terrestrial habitats) in those

- reaches of the Namoi and Gwydir River drainages identified as prime habitat for the species.
- 16.5: Develop and promote guidelines and provide incentives for landowners and users to reduce the impact of current land use practices on the species outside reserves.
- 16.6: Develop community awareness within the species' known range.
- 16.7: Monitor and regulate water quality within the upper reaches of the Namoi and Gwydir River drainages.

**17. Organisations responsible for conservation of species and individuals involved:**  
New South Wales National Parks and Wildlife Service.

**18. Other organisations and individuals involved:** Paul Canfield (Dept of Veterinary Pathology, Sydney University), John Cann (Sydney), Arthur Georges (University of Canberra), Ross Sadler (Australian Museum).

**19. Can recovery plan be carried out with existing resources?:** No. It has been suggested (Arthur Georges, *in litt.*) that the data collection recommended in 13.2 and Recovery Plan Objective 14.2, could together form the subject of an MSc project, in which case the salary component in the following budget could be reduced by up to 50%:

- |    |   |              |
|----|---|--------------|
| 1. | Survey of geographic range, habitat preferences and occurrence in reserves: 1 half-time worker for 2 years - \$40,000 salary; \$20,000 expenses.      | <b>\$60K</b> |
| 2. | Research into basic biology and ecology, including assessment of threatening processes: 1 worker half-time for 2 years - \$40,000; \$20,000 expenses. | <b>\$60K</b> |
| 3. | Preparation of management strategies: 1 worker for 3 months - \$10,000 salary; \$2,000 expenses.  | <b>\$12K</b> |
| 4. | Purchase of land for the reserve system: uncosted.  |              |

**Total \$132K**

**20. Remarks:** Thirteen specimens documented in Australian museum collections. A preliminary investigation into the cause of the eye disease in these tortoises has been initiated by Dr Paul Canfield, Dept of Veterinary Pathology, Sydney University.

**References:**

- Cann, J. 1978. Tortoises of Australia. Angus & Robertson, Australia. 79 pp.
- Georges, A. and Adams, M., 1992. A phylogeny for Australian chelid turtles based on allozyme electrophoresis. Australian Journal of Zoology 40: 453-76.



1. <b>Family:</b>	Chelidae
2. <b>Scientific Name:</b>	<i>Emydura signata</i> (population in Bellinger River, NSW)
3. <b>English Name:</b>	Bellinger River Emydura

4. **Intraspecific taxa:** Polytypic populations of *Emydura signata* as it is currently recognised, range from the Brisbane River in the north to the Nepean River in the south. Studies by Arthur Georges and colleagues have failed to find consistent variation among populations of *E. macquarii*, *E. krefftii* and *E. signata* and it may transpire that they are all subspecies of a single widespread polytypic species (Arthur Georges, *in litt.*).

5. **Taxon survival status:** Vulnerable.

6. **Former distribution:** Not known to have differed from current distribution. Opportunistic but widespread searching for this taxon has been conducted over the past 15-20 years along the length of the Bellinger River (John Cann, pers. comm.) but it has only ever been found at the one locality.

7. **Current distribution:** Known only from a single locality near Thora on the Bellinger River, north-eastern New South Wales.

8. **Habitat:** Rivers. Several long deep pools in the moderately broad mid-reaches of the river.

9. **Reasons for decline:** Not known to have declined (there have been no surveys of the populations) but its apparently restricted distribution and small population size make this taxon vulnerable to a combination of factors including logging of native forests leading to water pollution and soil degradation. Line fishing may be a minor threat.

Native forests are still being logged in the upper reaches of the river near Woods Creek and extensive runoff and soil erosion occur during periods of heavy rainfall (Ross Sadlier, pers. comm.). Tortoise populations downstream would be vulnerable to the resultant increased sediment loads. A proposal is under consideration to pipe water from the Bellinger River to augment the present water supply for the city of Coffs Harbour; this could deleteriously affect the

tortoise by changing the river's ecology.

Line fishing for bass is another potential threat because chelid tortoises are known to take baits from fishing lines although the long-term consequences are not documented.

The reasons for the apparent scarcity of this taxon are unknown and perplexing, particularly when the Bellinger River Elseya (*Elseya sp. nov.*) (Rare or Insufficiently Known), despite its apparent sensitivity to poor water quality, has been recorded from a number of localities in the mid to upper reaches of the Bellinger River and its tributary the Kalang River (John Cann pers. comm.).

10. **Conservation reserves on which taxon occurs:** None known.

10A. **Other conservation reserves where taxon might be expected to occur:** New England NP; it may occur in the upper reaches of the Bellinger River within the Park.

11. **Other public land on which taxon occurs:** None known.

12. **Other land on which taxon occurs:** The only known locality is "Ralph's Crossing", approximately 11 km upstream from Thora; the taxon is potentially present on private properties through which the mid-reaches of the Bellinger River flow.

13. **Is knowledge about taxon adequate for objectives and actions to be defined accurately?:** No.

13.1: Ground surveys need to be conducted to determine the full geographic range of the taxon, its habitat preferences, and the extent of its occurrence in existing reserves.

13.2: Research is needed into the basic biology and ecology of the taxon in the field including long term monitoring of changes in population size, habitat use and geographic range of the taxon.

13.3: Research is needed to document the extent of the taxon's apparent decline and to identify the major factors contributing to that decline.

**14. Recovery Plan objectives:**

14.1: To obtain sufficient information on the taxon's biology, ecology and distribution to determine its current conservation status and formulate appropriate management strategies.

14.2: To ensure that secure, viable populations of the taxon are maintained within a reserve system.

14.3: To implement land management practices which promote the maintenance of secure, viable populations of the taxon outside reserves.

**15. Management actions already initiated:**  
None known.

**16. Management actions required:**

16.1: Survey known and potential habitat in reserves within the taxon's known range.

16.2: Survey known habitat outside reserves within the taxon's known range.

16.3: Establish aquatic reserves (including adjacent terrestrial habitats) in those reaches of the Bellinger River drainage identified as prime habitat for the taxon.

16.4: Develop and promote guidelines and provide incentives for landowners and users to reduce the impact of current land use practices on the taxon outside reserves.

16.5: Develop community awareness within the taxon's known range.

16.6: Monitor and regulate water quality within the Bellinger River drainage.

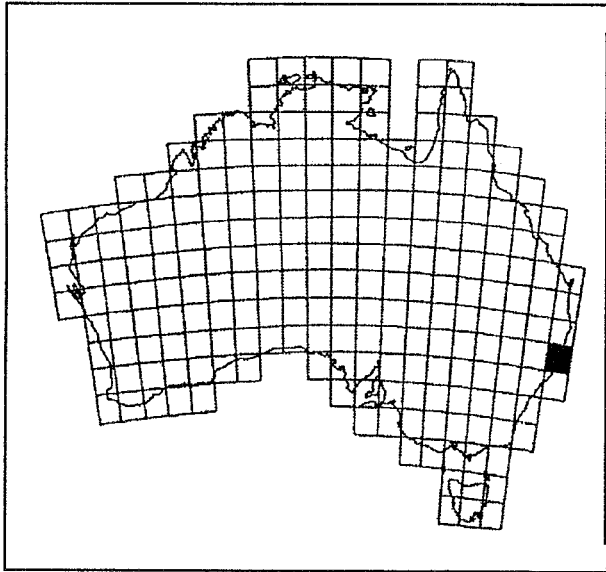
**17. Organisations responsible for conservation of taxon and individuals involved:**  
New South Wales National Parks and Wildlife Service.

**18. Other organisations and individuals involved:** John Cann (Sydney), Arthur Georges (University of Canberra), Ross Sadlier (Australian Museum).

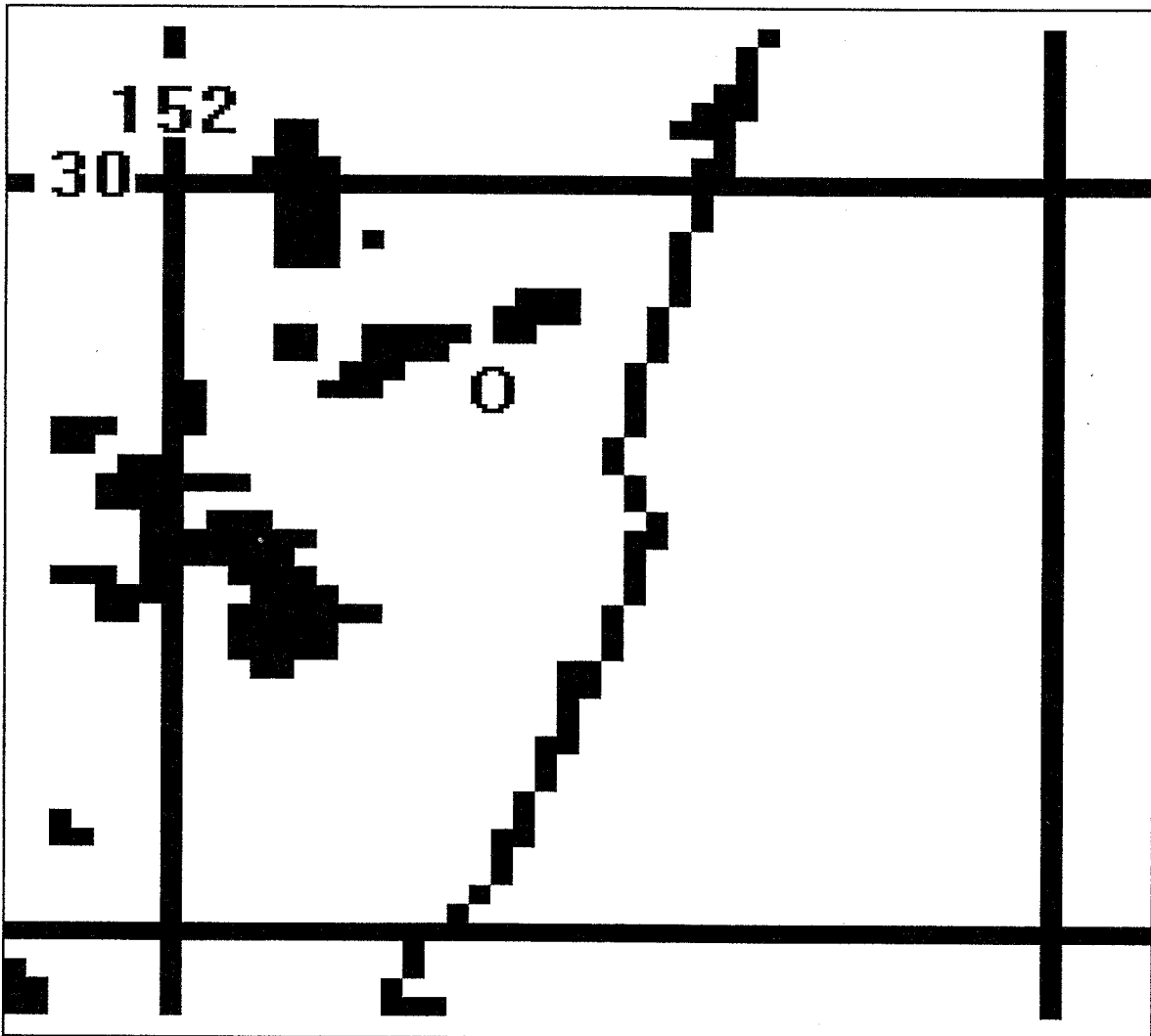
**19. Can recovery plan be carried out with existing resources?: No.**

- |    |   |                     |
|----|---|---------------------|
| 1. | Survey of geographic range, habitat preferences and occurrence in reserves: 2 workers half-time for 2 years - \$80,000 salary; \$40,000 expenses.               | \$120K              |
| 2. | Research into basic biology and ecology, including assessment of threatening processes: 1 worker quarter-time for 2 years - \$20,000 salary; \$10,000 expenses. | \$30K               |
| 3. | Preparation of management strategies: 1 worker for 3 months - \$10,000 salary; \$2,000 expenses.  | \$12K               |
| 4. | Purchase of land for the reserve system: uncosted.  |                     |
|    |   | <b>Total \$162K</b> |

**20. Remarks:** Two specimens documented in Australian museum collections. A total of six individuals has been recorded (John Cann, pers. comm.).



Distribution of *Emydura signata*



- |                     |  |
|---------------------|--|
| 1. Family:          | Chelidae                                     |
| 2. Scientific Name: | <i>Pseudemydura umbrina</i> Siebenrock, 1901 |
| 3. English Name:    | Western Swamp Tortoise                       |

4. **Intraspecific taxa:** None
5. **Species survival status:** Endangered (Critical).
6. **Former distribution:** No localised records prior to 1953, since when it has been recorded from scattered localities in a narrow strip of the Swan Coastal Plain north of Perth city, extending from Guildford to Bullsbrook (Burbidge and Kuchling, in press). Anecdotal information collected by Burbidge (1981) suggests its former distribution was restricted to the clay soils of the Swan River Valley - an area encompassing no more than 100-150 km<sup>2</sup>.
7. **Current distribution:** Ellen Brook Nature Reserve north-east of Perth city, Western Australia.
8. **Habitat:** Swamps. "Shallow, ephemeral, winter-wet swamps on clay or sand over clay soils with nearby suitable aestivation refuges." (Burbidge and Kuchling, in press).
9. **Reasons for decline:** Clearance of habitat for agriculture, urban and industrial development (including clay mining), increasing aridity, predation by foxes, inappropriate fire regimes (Twin Swamps NR), drainage.
- All these threats are compounded by the specialised biology of the species (which has low fecundity and slow maturation) and by the paucity of protected habitat within what is the most intensively developed region of WA.
10. **Conservation reserves on which species occurs:** Ellen Brook NR; until 1985 also occurred in the nearby Twin Swamps NR.
- 10A. **Other conservation reserves where species might be expected to occur:** None.
11. **Other public land on which species occurs:** None.
12. **Other land on which species occurs:** Small numbers captured in recent years on two lots of private property adjacent to Ellen Brook NR (Andrew Burbidge, *in litt.*, 1993). Captive breeding population at the Perth Zoo.
13. **Is knowledge about species adequate for objectives and actions to be defined accurately?:** Yes.
14. **Recovery Plan objectives:** "To ensure the survival of the Western Swamp Tortoise by creating at least two viable wild populations" (Burbidge and Kuchling, in press: 5).
15. **Management actions already initiated:**
- 15.1: Listed on Schedule 1 of the Commonwealth's *Endangered Species Protection Act 1992* and listed as "threatened" on the 1990 Schedule of the *WA Wildlife Conservation Act 1950*.
- 15.2: Two Class A Nature Reserves managed by the WA Department of Conservation and Land Management. More land has been purchased and added to the Reserves and negotiations are continuing to purchase two more lots adjacent to Ellen Brook NR.
- 15.3: Preparation and implementation of a Management Plan for Ellen Brook NR including actions listed in 15.4-15.6 below.
- 15.4: Experimental rehabilitation of habitat including pond construction, monitoring of aquatic invertebrates, revegetation, provision and monitoring of aestivation tunnels.
- 15.5: Ongoing fire management, construction of a "fox-proof" fence and regular poison baiting inside the fence, and works to mitigate the deleterious effects of land usage adjacent to the reserves.
- 15.6: Monitoring of population including radio-tracking, recording nests and breeding success and hatchling growth and survival.
- 15.7: Captive breeding program under way to

- raise tortoises to 2+ years for re-introduction to Twin Swamps NR.
- 15.8 Construction of fox-proof fence around Twin Swamps NR prior to proposed re-introduction of captive-bred animals.
16. **Management actions required** (based on actions recommended in the Draft Recovery Plan prepared by Burbidge and Kuchling, in press: 22-33):
- 16.1: Preparation and implementation of a Management Plan for Twin Swamps NR, including replenishment of swamps.
- 16.2: Completion of negotiations and purchase of additional private property adjacent to Ellen Brook NR.
- 16.3: Continuation of education and publicity programs on Western Swamp Tortoise.
- 16.4: Continuation of campaign to raise funds for the tortoise's conservation.

17. **Organisations responsible for conservation of species and individuals involved:** Western Australian Department of Conservation and Land Management (CALM). CALM members of the Recovery Team are Andrew Burbidge (chair), Phil Fuller, Lyndon Mutter and Gordon Wyre.

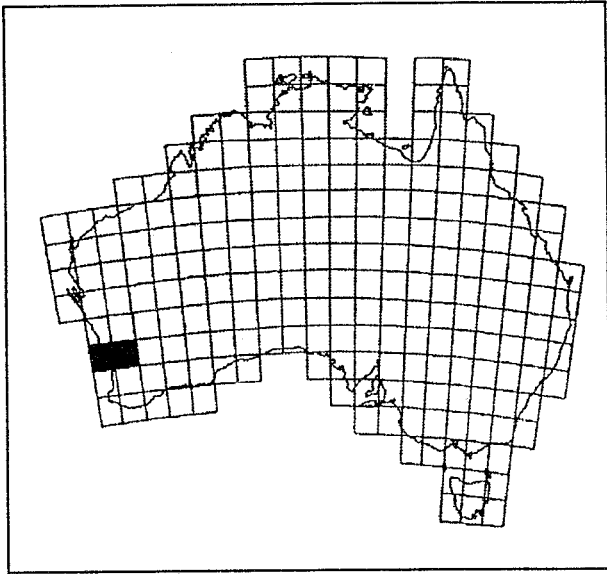
18. **Other organisations and individuals involved:** Non-CALM members of Recovery Team include Dr Gerald Kuchling and Professor Don Bradshaw (University of Western Australia), David Groth (Curtin University of Technology), and representatives of Australian Nature Conservation Agency, Perth Zoo and World Wide Fund for Nature.

19. **Can recovery plan be carried out with existing resources?:** Recovery Plan for the Western Swamp Tortoise is fully funded for 1993 and funding has been allocated for the next four years. Funding comes from CALM, Endangered Species Program and Feral Pests Program, ANCA, Perth Zoo, Western Australian Water Authority, the World Wide Fund for Nature Australia, and several other smaller donors and sponsors (Andrew Burbidge, *in litt.*).

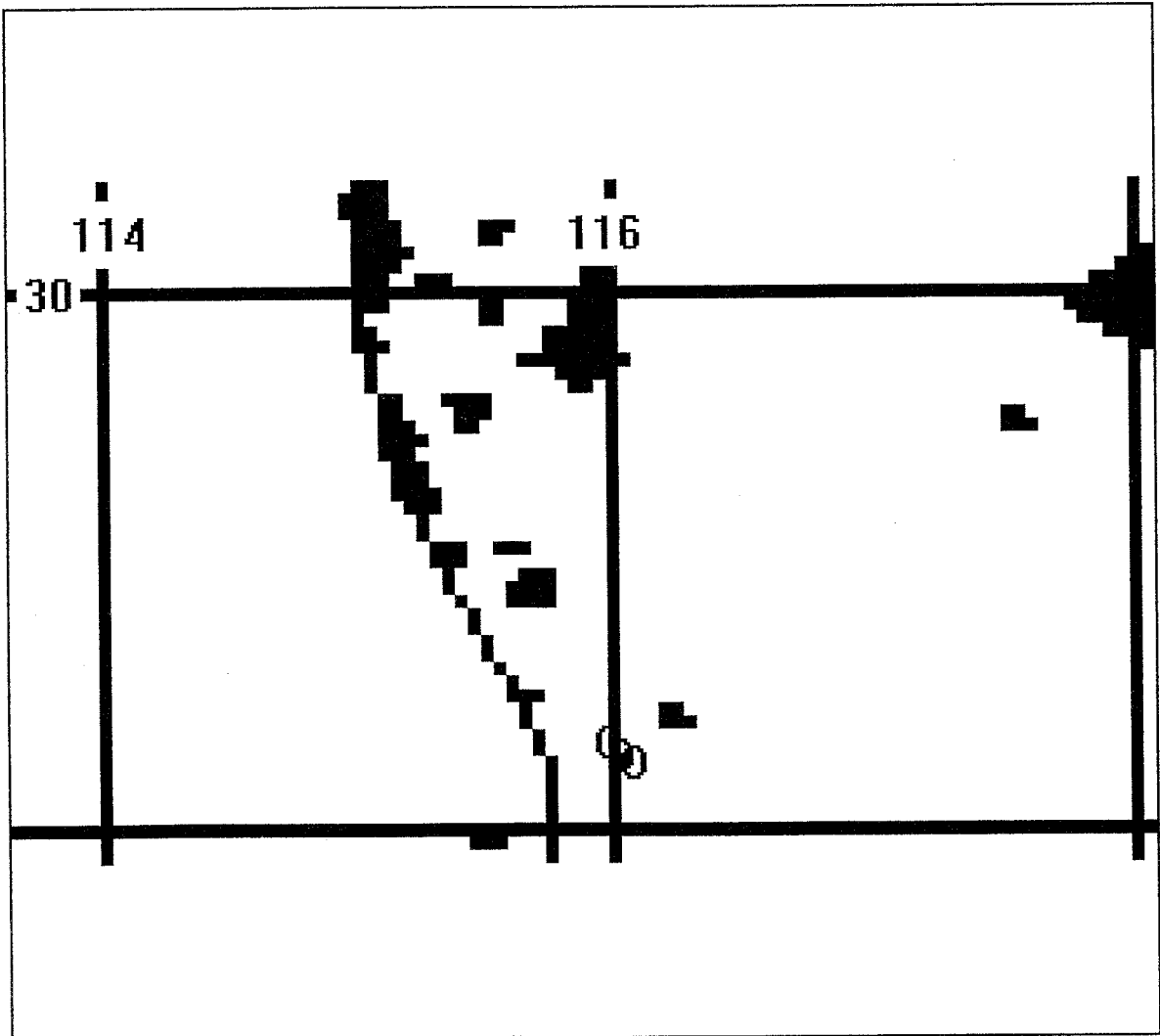
20. **Remarks:** 40 specimens documented in Australian museum collections; wild population estimated at 30 and may be slightly above this figure. Total holdings in Perth Zoo at December 1992: 14 males, 12 females and 47 unsexed juveniles.

**References:**

- Burbidge, A.A. 1981. The ecology of the Western Swamp Tortoise, *Pseudemydura umbrina* (Testudines, Chelidae). Australian Wildlife Research 8: 203-222.
- Burbidge, A.A. and Kuchling, G. (in press). Recovery plan for the Western Swamp Tortoise (*Pseudemydura umbrina*). Western Australian Department of Conservation and Land Management.
- Kuchling, G. and DeJose, J.P. 1989. A captive breeding operation to rescue the critically endangered Western Swamp Turtle *Pseudemydura umbrina*. International Zoo Yearbook 28: 103-109.



Distribution of *Pseudemydura umbrina*



1. Family:	Chelidae
2. Scientific Name:	<i>Rheodytes leukops</i> Legler and Cann, 1980
3. English Name:	Fitzroy Tortoise

4. **Intraspecific taxa:** None.
5. **Species survival status:** Vulnerable.
6. **Former distribution:** Not known to have differed from current distribution.
7. **Current distribution:** Known only from the Fitzroy River and its tributaries, Queensland, with a maximum geographic range of less than 10,000 km<sup>2</sup> (McDonald *et al.*, 1991).
8. **Habitat:** Rivers.
- The rivers in which it has been found are characterised by large deep pools with rocky, gravelly or sandy substrates, connected by shallow riffles (Legler and Cann, 1980); high water clarity appears to be preferred by the tortoises. Extensive beds of Ribbon Weed (*Vallisneria* sp.) are associated with several of the sites where *R. leukops* is still seen regularly, and the weed is known to be eaten by the tortoises. Nests are excavated in river sand banks.
9. **Reasons for decline:** Probably a combination of factors including soil and water pollution resulting from mining and agricultural activities, and clearance of adjacent habitat for crop production.
- In several rivers which were previously clear, turbidity and deep sedimentation have been observed in recent years; causes appear to be soil erosion in paddocks heavily grazed by cattle, and spillage of tailings from greenstone mines (John Cann, *in litt.*).
10. **Conservation reserves on which species occurs:** None known.
- 10A. **Other conservation reserves where species might be expected to occur:** None known.
11. **Other public land on which species occurs:** Roadside reserves beside river crossings listed in 12. below, within the species' range.
12. **Other land on which species occurs:** Private properties through which the following rivers and tributaries flow: Fitzroy River in vicinity of Glenroy Crossing; Connors River near the crossing of the old inland Sarina road; Dawson River close to Gainesford; vicinity of crossing of the Dawson River south-east of Duaringa; Develin or Marlborough Creek; Fitzroy Pocket Road crossing near Gogango; Isaac River; Mackenzie River between Bedford and Bingegang Weirs; Windah Creek (all in the Fitzroy River drainage) (John Cann, *in litt.*).
13. **Is knowledge about species adequate for objectives and actions to be defined accurately?:** No.
- 13.1: Ground surveys need to be conducted to determine the full geographic range of the species, its habitat preferences, and the extent of its occurrence in existing reserves.
- 13.2: Research is needed into the basic biology and ecology of the species in the field; it should include long term monitoring of changes in population size, habitat use and geographic range.
- 13.3: Research needed to document the extent of the species' decline and to identify the major factors contributing to that decline.
14. **Recovery Plan objectives:**
- 14.1: To obtain sufficient information on the species' biology, ecology and distribution to determine its current conservation status and formulate appropriate management strategies.
- 14.2: To ensure that secure, viable populations of the species are maintained within a reserve system.
- 14.3: To implement land management practices which promote the maintenance of secure, viable populations of the species outside reserves.
15. **Management actions already initiated:**
- 15.1: Listed on Schedule 1 of the Commonwealth's *Endangered Species*

*Protection Act 1992.*

- 16. Management actions required:**
- 16.1: Survey known and potential habitat in reserves within the species' known range.
  - 16.2: Survey known habitat outside reserves within the species' known range.
  - 16.3: Establish aquatic reserves (including adjacent terrestrial habitats) in those reaches of the Fitzroy drainage identified as prime habitat for the species.
  - 16.4: Develop and promote guidelines for landowners and users to reduce the impact of current land use practices on the species outside reserves.
  - 16.5: Develop community awareness within the species' known range.

16.6: Monitor and regulate water quality within the Fitzroy River drainage.

**17. Organisations responsible for conservation of species and individuals involved:** Queensland Department of Environment and Heritage; Queensland Department of Minerals and Energy.

**18. Other organisations and individuals involved:** John Legler (University of Utah); John Cann (Sydney); Arthur Georges (University of Canberra).

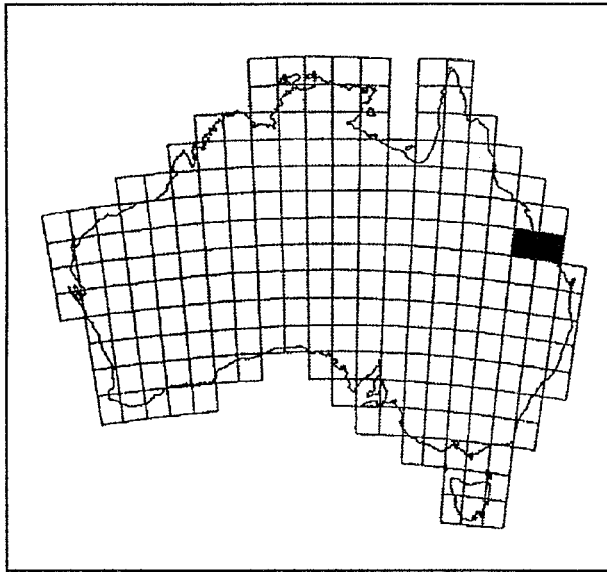
<b>19. Can recovery plan be carried out with existing resources?:</b> No.	
1. Survey of geographic range, habitat preferences and occurrence in reserves: 2 workers quarter-time for 2 years - \$40,000 salary; \$20,000 expenses.	<b>\$60K</b>
2. Research into basic biology and ecology, including assessment of threatening processes: 1 worker half-time for 2 years - \$40,000 salary; \$20,000 expenses.	<b>\$60K</b>
3. Preparation of management strategies: 1 worker for 3 months - \$10,000 salary; \$2,000 expenses.	<b>\$12K</b>
4. Purchase of land for the reserve system: uncosted.	
	<b>Total \$132K</b>

**20. Remarks:** Approximately 200 specimens (including hatchlings) documented in museum collections.

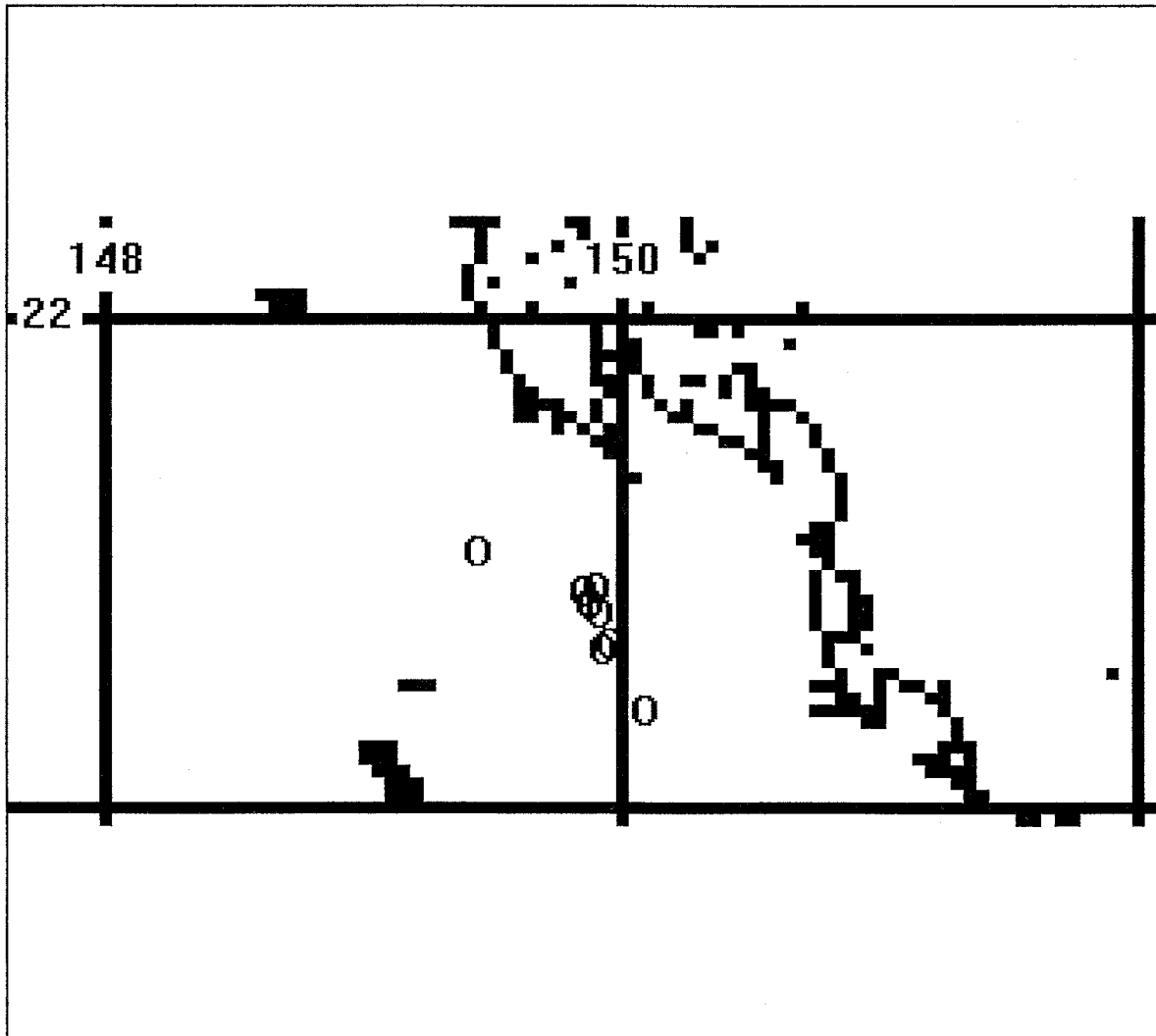
**References:**

Legler, J.M. and Cann, J. 1980. A new genus and species of chelid turtle from Queensland, Australia. *Contributions in Science, Natural History Museum of Los Angeles County* 324: 1-18.

McDonald, K.R., Covacevich, J.A., Ingram, G.J. and Couper, P.J. 1991. The status of frogs and reptiles. pp. 338-345 *in* G.J. Ingram and R.J. Raven (eds) *An Atlas of Queensland's Frogs, Reptiles, Birds and Mammals*. Queensland Museum, Brisbane.



Distribution of *Rheodytes leukops*



1. <b>Family:</b>	Chelidae
2. <b>Scientific Name:</b>	<i>Gen. nov. sp. nov.</i> (Mary River, QLD) [also appears in the literature as Short-necked Alpha]
3. <b>English Name:</b>	Mary River Tortoise

4. **Intraspecific taxa:** None

5. **Species survival status:** Endangered.

6. **Former distribution:** Not known to have differed from current distribution.

7. **Current distribution:** Known only from the Mary River, south of Maryborough in south-eastern Queensland. The two localities from which it has been recorded are Tiaro and Miva, on the mid-reaches of the river. Suitable habitat appears to be present along a 100 km stretch of the river, extending upstream from the seawater barrage north of Tiaro. A description of the Mary River appears in Hauser *et al.* (1992) and section maps 12-17 in that report refer to the stretch of river where the tortoise has been recorded.

8. **Habitat:** Rivers.

Deep pools in the moderately broad mid-reaches of the river; it has not been observed in the shallower sections of the river.

9. **Reasons for decline:** Not known to have declined (there have been no surveys of the populations) but its apparent restricted distribution and small population size probably make this species highly vulnerable to a number of factors including clearance of riverside habitat, crop production, overgrazing by cattle, and soil and water pollution resulting from agricultural and mining activities; visitor disturbance and nest predation are also threats.

At the downstream locality of Tiaro the sandy banks in which the tortoises nest are vulnerable to disturbance by frequent visitation by people for recreation (John Cann, pers. comm.). Upstream at Miva, nests are subject to trampling by cattle and entire sandbanks and sandbars are eroded by long-term trampling. Heavy nest predation by foxes has been observed by Arthur Georges (*in litt.*).

The upstream locality is surrounded by cleared country which is heavily grazed by cattle (Cann & Legler, in prep.); tortoises here are vulnerable to the effects of increased runoff, siltation, and pollution resulting from the clearance and grazing.

The water in the mid-reaches of the Mary River is nearly always brown and turbid, but according to local residents has only become so in the past 20 years (John Cann, pers. comm.); the change is attributed to increased commercial sand-mining upstream (Cann & Legler, in prep.). The increased siltation has resulted in the deeper holes (the preferred habitat of the species) becoming filled in, effectively reducing the area of available habitat and probably, the size of the populations. A description of some of the soil and water degradation appears in Hauser *et al.* (1992).

Downstream of the known range of the species the river is subject to extensive pumping for irrigation of sugarcane and citrus crops (John Cann, pers. comm.); should populations occur in this section of the river, they would be vulnerable to changes in water levels and the effects of pollution associated with runoff from these activities.

A past threat was the poaching of eggs and sale of the hatchlings for the pet shop trade; this trade has apparently ceased. Females congregate over short periods of time to lay eggs in a few concentrated nesting sites which makes them very vulnerable to nest predation and also to mass loss of reproductive effort through single flood events.

10. **Conservation reserves on which species occurs:** None known.

10A. **Other conservation reserves where species might be expected to occur:** None known.

11. **Other public land on which species occurs:** None known.

12. **Other land on which species occurs:** Private properties through which the Mary River flows between Miva and Tiaro, south of Maryborough.

13. Is knowledge about species adequate for objectives and actions to be defined accurately?: No.

13.1: Ground surveys need to be conducted to determine the full geographic range of the species, its habitat preferences, and its possible occurrence in nearby reserves.

13.2: Research is needed into the basic biology and ecology of the species in the field including long term monitoring of changes in population size, habitat use and geographic range of the species.

13.3: Research is needed to determine if the species is declining, and if so, to identify the major factors contributing to that decline.

14. **Recovery Plan objectives:**

14.1: To obtain sufficient information on the species' biology, ecology and distribution to determine its current conservation status and formulate appropriate management strategies.

14.2: To ensure that secure, viable populations of the species are maintained within a reserve system.

14.3: To implement land management practices which promote the maintenance of secure, viable populations of the species outside reserves.

15. **Management actions already initiated:** None known.

16. **Management actions required:**

16.1: Survey known and potential habitat in reserves within the species' known range.

16.2: Survey known habitat outside reserves within the species' known range. Tinana Creek flowing parallel and east of the Mary River, should be surveyed for this species (John Cann, pers. comm.).

16.3: Establish aquatic reserves (including adjacent terrestrial habitats) in those reaches of the Mary River drainage identified as prime habitat for the species.

16.4: Develop and promote guidelines and provide incentives for landowners and users to reduce the impact of current land use practices on the species outside reserves.

16.5: Develop community awareness within the species' known range.

16.6: Monitor and regulate water quality within the Mary River drainage.

17. **Organisations responsible for conservation of species and individuals involved:** Queensland Department of Environment and Heritage.

18. **Other organisations and individuals involved:** John Cann (Sydney), Arthur Georges (University of Canberra), John Legler (University of Utah), Ross Sadler (Australian Museum).

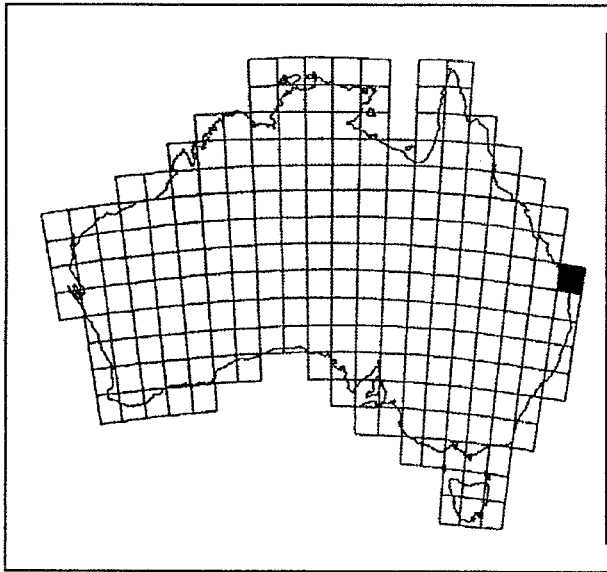
<p>19. <b>Can recovery plan be carried out with existing resources?:</b> No. It has been suggested (Arthur Georges and Col Limpus, <i>in litt.</i>) that many of the objectives outlined above could be addressed by a PhD project in which case the salary component in the following budget could be reduced by up to 50%:</p>	
1.	Survey of geographic range, habitat preferences and occurrence in reserves: 2 workers quarter-time for 2 years - \$40,000 salary; \$20,000 expenses. <b>\$60K</b>
2:	Research into basic biology and ecology, including assessment of threatening processes: 1 worker half-time for 2 years - \$40,000 salary; \$20,000 expenses. <b>\$60K</b>
3:	Preparation of management strategies: 1 worker for 3 months - \$10,000 salary; \$2,000 expenses. <b>\$12K</b>
4:	Purchase of land for the reserve system: uncosted.
<b>Total \$132K</b>	

20. **Remarks:** 14 specimens documented in museum collections with locality data; an additional 26 specimens of unknown origin (originating from the pet-shop trade). This species has been known colloquially as the 'pet-shop tortoise' because until recently it was known only from specimens obtained through the pet trade. John Cann (pers. comm.) has observed extreme aggression in this species (compared with other chelids)

between captive adult males placed in the same pool. Such behaviour suggests that in natural populations adult males may defend well defined and possibly extensive territories to the exclusion of other adult males. If such a social structure is confirmed, it must be taken into account when planning the size and configuration of conservation reserves.

**References:**

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- Georges, A. and Adams, M., 1992. A phylogeny for Australian chelid turtles based on allozyme electrophoresis. *Australian Journal of Zoology* 40: 453-476.
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Distribution of *Gen. nov. sp. nov.*  
(Chelidae)

