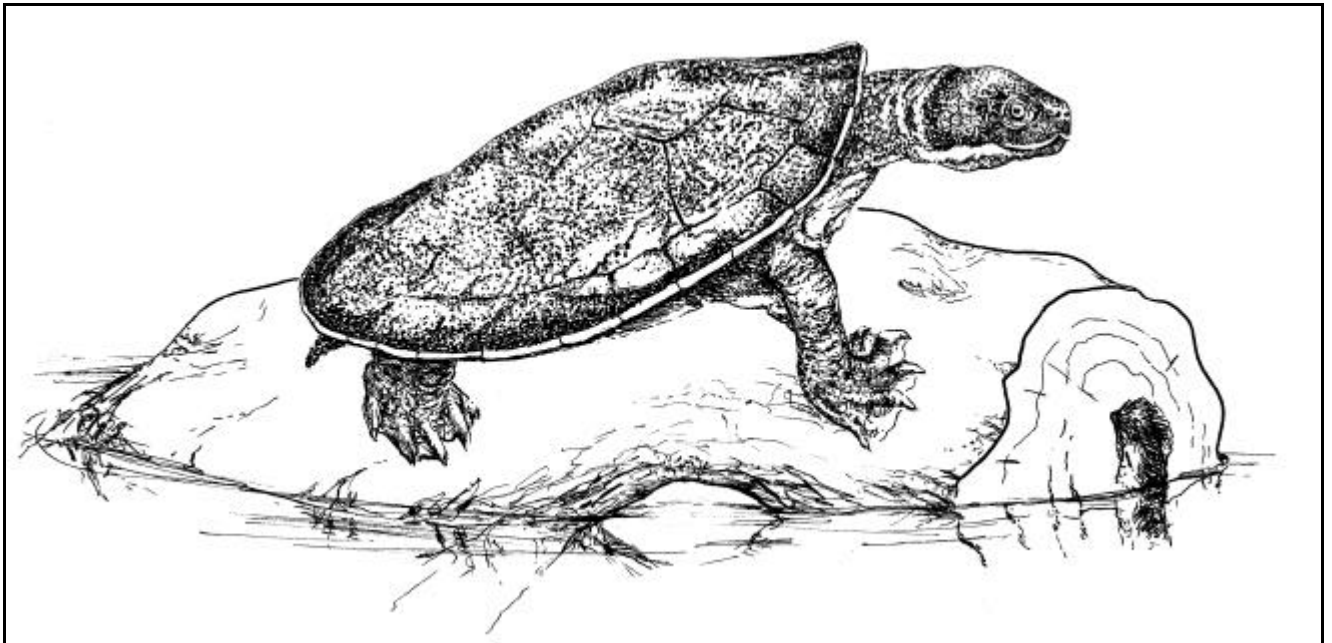


Bellinger River Emydura
Emydura macquarii
(Bellinger River)
Recovery Plan



July 2001

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Bellinger River Emydura

Emydura macquarii

(Bellinger River)

Recovery Plan

Foreword

The conservation of threatened species, populations and ecological communities is crucial for the maintenance of this State's unique biodiversity. In NSW, the *Threatened Species Conservation Act 1995* (TSC Act) provides the framework to conserve and recover threatened species, populations and ecological communities through the preparation and implementation of recovery plans.

The preparation and implementation of recovery plans is identified by both the National Strategy for the Conservation of Australia's Biological Diversity and the draft NSW Biodiversity Strategy as a key strategy for the conservation of threatened flora and fauna. The object of a recovery plan is to document the research and management actions required to promote the recovery of a threatened species, population or ecological community and to ensure its ongoing viability in nature.

The TSC Act requires that the Director-General of National Parks and Wildlife prepare recovery plans for all species, populations and ecological communities listed as endangered or vulnerable on the TSC Act schedules. Similarly, the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires the Commonwealth Minister for the Environment ensure the preparation of a recovery plan for nationally listed species and communities or adopt plans prepared by others including those developed by state agencies. Both Acts include specific requirements for the matters to be addressed by recovery plans and the process for preparing recovery plans. This recovery plan has been prepared to satisfy both the requirements of the TSC Act and the EPBC Act.

This recovery plan describes our current understanding of the Bellinger River Emydura, documents the research and management actions undertaken to date, and identifies the actions required and parties responsible in addressing the conservation of the taxon in the wild.

Brian Gilligan
Director-General
Environment

Bob Debus MP
Minister for the

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1.0 Introduction

The Bellinger River Emydura is a rare form of the freshwater turtle *Emydura macquarii* (Gray, 1830) and is restricted in distribution to the Bellinger River on the NSW mid north coast. It is listed as a vulnerable species on Schedule 2 of the *Threatened Species Conservation Act 1995* (TSC Act) and also as a vulnerable species in the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The aim of this recovery plan is to identify the full range of the taxon, identify and control threats and encourage protection and management of habitat in cooperation with the community.

2.0 Description and distribution

The genus *Emydura* (Family Chelidae) is a group of short-necked turtle species inhabiting rivers, streams, billabongs and lagoons in eastern and northern Australia and southern New Guinea (Cogger 1996). The most recent taxonomic treatment of freshwater turtles in NSW regards *Emydura macquarii* as a widespread species occurring in the rivers of the Murray-Darling Basin as well as coastal rivers of northern NSW and south-eastern Queensland (Cann 1998). Populations of *Emydura macquarii* from the coastal rivers of northern NSW and south-eastern Queensland were previously considered a separate species, *Emydura signata* (Cogger 1996). Cann (1998) formally recognised different subspecies of *Emydura macquarii* for the Brisbane River, Clarence River, Macleay and Hastings Rivers, and Hunter River, but did not formally describe the Bellinger River Emydura as a distinct subspecies, presumably because of a lack of comparative material. Only two specimens are held in the Australian Museum.

Cann (1998) reported that the Bellinger River Emydura was a morphologically distinct form of *Emydura macquarii*, with the carapace (or upper shell) considerably more flared towards the rear than subspecies of *Emydura macquarii* from other rivers, a shell length of up to 25 cm and a golden-yellow iris with a yellowish inner ring.

Spencer and Thompson (2000), however, noted that there was much morphological variation within *Emydura macquarii* and that the flared carapace and iris colour may not be diagnostic characteristics of the Bellinger River population. Further work is needed to determine any genetic or morphological distinctiveness of the Bellinger River Emydura.

The Bellinger River Emydura may be confused with the two other species of turtle which occur in the Bellinger River, the Eastern Snake-necked Turtle (*Chelodina longicollis*) and the Bellinger River Elseya (*Elseya georgesi*). It can be distinguished from these species by the combination of short neck (extended head and neck shorter than shell), golden yellow iris, and lighter coloured shell without a serrated rear margin and without black-edged seams on the underside.

The Bellinger River Emydura is known from two sites along a single stretch of the Bellinger River upstream from Thora (Cann 1993a; Cogger *et al.* 1993; Spencer and Thompson 2000) (Figure 1). It has also been recorded at one site in the vicinity of Bellingen township (Cann pers. comm. 1999), although occurrence at this location may be the result of accidental or intentional release of pet animals (Spencer and Thompson 2000).

Given that the Bellinger River Emydura has an apparently restricted distribution and a small total population, exact locations are not provided to protect the taxon from illegal collection.

3.0 Current conservation status

While at the species level *Emydura macquarii* is widespread in NSW with a current status of common and secure, the Bellinger River population is rare and at risk. The Bellinger River Emydura is possibly one of the rarest turtles in Australia (Cann 1998). The number of animals within the population is unknown but is thought to be small. At the location near Thora a total of only eight individuals have been recorded (Spencer and Thompson 2000). There is no evidence to suggest that the Bellinger River Emydura's population has declined or its range contracted; however, given its restricted range and the evidence of threats, it is likely to become endangered unless the factors threatening its survival cease to operate (NSW Scientific Committee 1997).

4.0 Habitat and ecology

Cann (1993a) reported that the Bellinger River Emydura is omnivorous with a diet including small crustaceans, aquatic insects, filamentous algae and possibly aquatic weed. Spencer and Thompson (2000), however, reported that it is primarily insectivorous, leading to considerable dietary overlap with the Bellinger River Elseya. The animals recorded near Thora on the upper Bellinger River occupy several long, deep pools

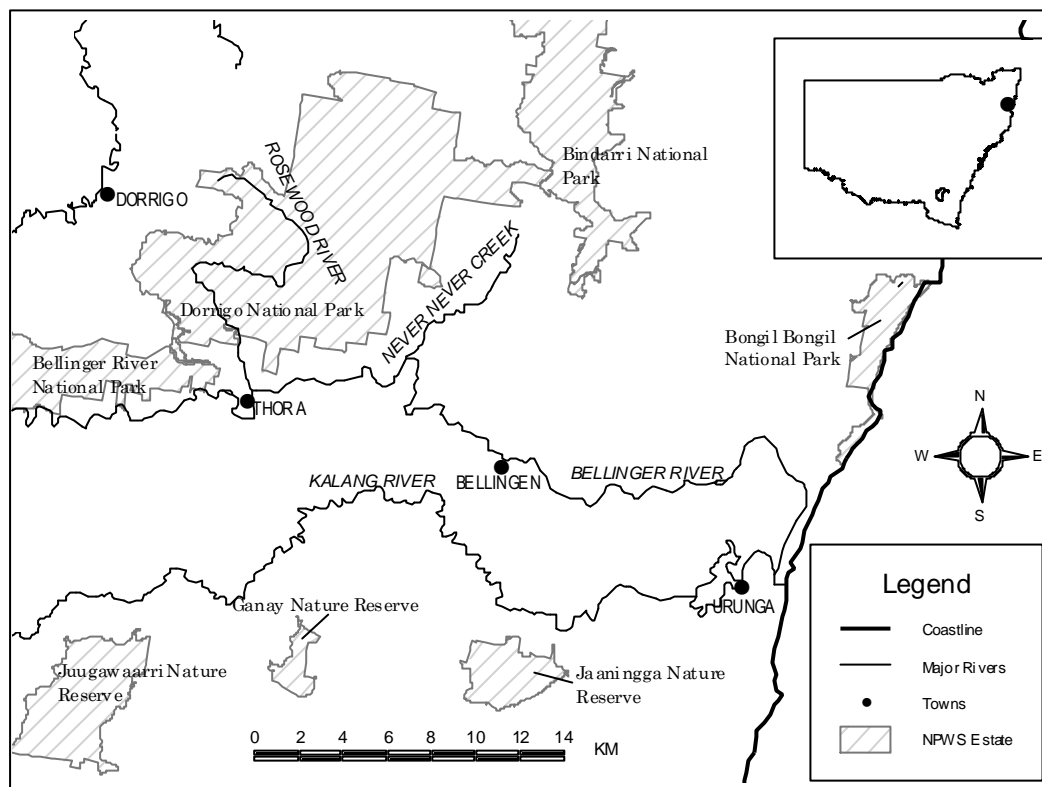


Figure 1. Bellinger River and associated tributaries.

in moderately broad reaches along a one kilometre section of the river (Cogger *et al.* 1993; Spencer and Thompson 2000).

Little information is available concerning the ecology of the Bellinger River Emydura. Nesting occurs from October to early January and multiple clutches may be laid (Cann 1998). Elsewhere, populations of *Emydura macquarii* utilise fallen timber (snags) in rivers as basking sites and lay their eggs in nests excavated in the river banks.

Riparian vegetation is a significant component of aquatic ecosystems (Koehn 1993), and is likely to be important for the Bellinger River Emydura. The values of riparian vegetation include the following:

- providing a major energy and nutrient input to ecosystem functioning in the form of organic matter such as leaves, bark and twigs;
- buffering against high water temperatures by providing shade;
- providing a source of river snags for basking;
- providing nesting sites;
- preventing streambank erosion;
- providing habitat for aquatic species with a terrestrial component to their lifecycles; and

- filtering sediment and pollutants from runoff from surrounding landuses.

5.0 Relevant legislation

The Bellinger River Emydura is listed as a vulnerable species on Schedule 2 of the TSC Act. The taxon (identified as *Emydura signata* (Bellinger River)) is also listed as a vulnerable species in the Commonwealth EPBC Act.

6.0 Recovery plan implementation

The TSC Act requires that a government agency must not undertake actions inconsistent with a recovery plan. The authorities responsible for the actions identified in this Plan are listed in Table 1.

The EPBC Act specifies that a Commonwealth agency must not take any action that contravenes a recovery plan.

6.1 Critical habitat

The TSC Act makes provision for the identification and declaration of critical habitat for species, populations and ecological communities listed as endangered. Once declared, it becomes an offence to damage

critical habitat (unless the action is specifically exempted by the TSC Act) and a species impact statement is mandatory for all developments and activities proposed within critical habitat.

The Bellinger River Emydura is not currently eligible for declaration of critical habitat because it is not listed as endangered under Schedule 1 of the TSC Act.

Under the EPBC Act, critical habitat may be registered for any nationally listed threatened species or ecological community. When adopting a recovery plan the Federal Minister for the Environment must consider whether to list habitat identified in the recovery plan as being critical to the survival of the species or ecological community. It is an offence under the EPBC Act for a person to knowingly take an action that will significantly damage critical habitat (unless the EPBC Act specifically exempts the action). This offence only applies to Commonwealth areas. However an action which is likely to have a significant impact on a listed species is still subject to referral and approval under the EPBC Act.

This Recovery Plan (section 4.0) identifies those habitat features currently known to be critical to the survival of the Bellinger River Emydura as required by the EPBC Act.

6.2 Environmental assessment

The TSC Act amendments to the environmental assessment provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act) require that consent and determining authorities consider relevant recovery plans when exercising a decision-making function under Parts 4 & 5 of the EP&A Act. Consent and determining authorities must consider the conservation strategy outlined in this plan when considering a proposed development or activity that may affect the Bellinger River Emydura.

Any other action not requiring approval under the EP&A Act, and which is likely to adversely affect the Bellinger River Emydura may be licensed under Part 6 of the TSC Act.

As the Bellinger River Emydura is listed nationally under the EPBC Act, any person proposing to undertake actions likely to have a significant impact on The Bellinger River Emydura should refer the action to the Commonwealth Minister for the Environment for consideration. The Minister will then decide whether the action requires EPBC Act approval. This is in addition to any State or Local

Government approval requirement specified above for the NSW EP&A Act.

Administrative guidelines are available, from Environment Australia, to assist proponents in determining whether their action is likely to have a significant impact. In cases where the action does not require EPBC Act approval, but will result in the death or injury of a member of the Bellinger River Emydura and the member is in, or on a Commonwealth area, a permit issued by the Commonwealth Minister under the EPBC Act, will be required.

7.0 Management issues

7.1 Threats

The three major threats to the Bellinger River Emydura have been identified as predation of nests by foxes (*Vulpes vulpes*), competition for food and other resources with the Bellinger River Elseya and introduction of captive or pet *Emydura macquarii*, sourced from elsewhere, into the Bellinger River population (Spencer and Thompson 2000).

Other threats and potential threats to the Bellinger River Emydura were listed by Cogger *et al.* (1993) and the NSW Scientific Committee (1997) as:

- water pollution and increased river sediment load resulting from activities including logging of native forests in the catchment upstream of the population and grazing and agricultural activities upstream and in the vicinity of the population;
- construction of bridges and fords upstream and in the vicinity of the population;
- extraction of river sand and gravel upstream and in the vicinity of the population; and
- line fishing.

Threats and potential threats additional to those listed above are clearing of riparian vegetation, degradation of riparian vegetation and river banks through access by domestic stock and reduced stream flow through extraction of water (Thompson 1983; Cann 1993a; Cann 1993b). It is also possible that sources of water pollution not identified above are a potential threat due to their cumulative effect on river health.

7.2 Social and economic consequences

This Recovery Plan aims to encourage community stewardship for the protection and recovery of the Bellinger River Emydura. Implementation of protection and management measures will be based on local community involvement.

The plan recommends consideration of potential impacts on the Bellinger River Emydura by consent and determining authorities considering developments and activities upstream or in the vicinity of known sites and in areas of potential habitat.

Funding for implementation of recovery actions is specified in Table 2. Implementation has been costed at \$34135 (priority 1) and \$108445 (priorities 1 and 2).

7.3 Biodiversity benefits

This Recovery Plan aims to promote the Bellinger River Emydura as a flagship species for management of the Bellinger River. Through awareness of the status of the Bellinger River Emydura the profile of river management issues and aquatic biodiversity and conservation issues will be raised in the local community.

The conservation of the Bellinger River Emydura as a restricted and vulnerable population of a widespread species will also raise community awareness of the issue of biodiversity conservation at the genetic or intra-species level.

8.0 Previous actions undertaken

8.1 Survey and research

Opportunistic searches for the Bellinger River Emydura along the length of the Bellinger River have been undertaken over a 20 year period, resulting in the discovery of the taxon at only one confirmed site. A targeted survey of areas of potential habitat in the Bellinger River and tributaries and the Kalang River has identified one additional site (Spencer and Thompson 2000). These two sites are located along a one kilometre stretch of the Bellinger River upstream of Thora.

Research concerning the ecology of the Bellinger River Emydura has provided information on diet and possible threats (Spencer and Thompson 2000). Blood samples from captured individuals have been lodged with the Australian museum for future genetic studies and to ensure the preservation of Bellinger River Emydura DNA.

8.2 Action plan

A species recovery outline for the Bellinger River Emydura was prepared by Cogger *et al.* (1993), summarising the available information concerning the taxon, listing threats and identifying recovery objectives and actions. Information from the Action Plan has been included in this recovery plan.

8.3 Habitat protection and management

The Bellinger Catchment Management Committee (BCMC) promoted a number of habitat protection measures on private lands, including the protection of riparian vegetation and protection of water quality. The Upper North Coast Catchment Management Board (CMB) has recently replaced Catchment Management Committees and will continue to honour BCMC commitments. The Mid North Coast Water Management Committee has been formed to prepare a River Management Plan as the basis for ecologically sustainable water resource management in the future.

In 2000, the Bellinger Care Coordinating Committee received \$56 400 from the National Heritage Trust to fund riparian zone management in the Bellinger catchment. The NPWS provided a further \$10 000 for this work in 2001. This work will assist in protecting and enhancing potential habitat of the Bellinger River Emydura.

Some areas of known and potential habitat for the Bellinger River Emydura are protected in Bellinger River National Park.

Riparian vegetation in Bellinger Shire is protected under the *Native Vegetation Conservation Act 1997* (NVC Act) and the current Bellinger Local Environmental Plan 1990 (LEP).

State Forests NSW (SFNSW) undertaking forestry activities in wood production forests in the Bellinger River catchment protect riparian buffers and implement a range of other measures to control soil erosion and protect water quality as outlined in the relevant Environmental Pollution Control Licence and the Threatened Species Licence for the Lower North East Region of the *Forestry and National Park Estate Act 1998* negotiated for the Integrated Forestry Operations Approval (NPWS and SFNSW 1999).

8.4 Community awareness

The Bellinger River Emydura has received considerable attention in the local media since listing as a vulnerable species, raising community awareness of the status of the species.

A Bellinger Turtle Group, with representatives from the local community, National Parks and Wildlife Service (NPWS) and Department of Land and Water Conservation (DLWC), has been formed to promote the conservation of the

Bellinger River Emydura and other turtle species in the local community.

8.5 Licensing of protected fauna

As protected fauna, *Emydura macquarii* that are sourced from outside the Bellinger River catchment and are being kept as pets must be licensed under the *National Parks and Wildlife Act 1974* (NPW Act).

9.0 Species' ability to recover

Given the current information base, the ability of the taxon to recover is unknown, but is considered likely to be positive. One new site has been reported since the Bellinger River Emydura was listed under the TSC Act in February 1997.

10.0 Recovery objectives

The overall objective of this recovery plan is to promote the recovery of the Bellinger River Emydura in the wild. Specific objectives for the first five years of this recovery plan are listed below.

- Objective 1: to encourage community stewardship of the conservation and recovery of the Bellinger River Emydura;
- Objective 2: to identify the full range of the taxon;
- Objective 3: to obtain information on the taxon's biology and ecology relevant to its recovery;
- Objective 4: to identify and manage threats to the taxon;
- Objective 5: to encourage monitoring and protection of water quality within the Bellinger River catchment; and
- Objective 6: to encourage and assist in improving protection and management of the taxon and its habitat.

11.0 Recovery performance criteria

Recovery performance criteria are listed below.

- Criterion 1: community awareness of the status of the Bellinger River Emydura, and community participation in its conservation and recovery, is increased;
- Criterion 2: survey for additional populations is undertaken;
- Criterion 3: research providing information on the taxon's ecology and biology relevant to recovery is supported;
- Criterion 4: control and abatement of identified threats is supported;
- Criterion 5: monitoring and protection of water quality in the upper Bellinger catchment is supported; and

- Criterion 6: the protection and management of the taxon and its habitat and potential habitat is improved.

12.0 Recovery actions

12.1 Survey and research

1. Monitoring of the recruitment of juveniles and subadults into the population will be undertaken using a combination of trapping and nest marking. This will be undertaken in conjunction with monitoring the effectiveness of fox control outlined in the NSW Threat Abatement Plan for Predation by the Red Fox (NPWS in prep), in which the Bellinger River Emydura has been identified as a high priority species for management actions. (*Objectives 3 and 6/Performance criteria 3 and 6*).
2. Further research to provide information concerning the biology and ecology of the Bellinger River Emydura relevant to the management of threats and the conservation of the taxon is supported. Research priorities are:
 - long term studies to determine specific habitat requirements;
 - DNA analysis to determine if the Bellinger River Emydura is a distinctive sub-group of *Emydura macquarii* or if it has been introduced from elsewhere;
 - determination of the full impact of external threats, including fox predation;
 - determination of the extent of interspecific competition between the Bellinger River Elseya and the Bellinger River Emydura; and
 - extended dietary analysis of the Bellinger River Elseya and the Bellinger River Emydura, including prey availability and ecology. (*Objectives 3 and 6/Performance criteria 3 and 6*).

Outcome

Increased knowledge of distribution of the taxon and its habitat, monitoring of recruitment levels, and collection of additional information to assist in the conservation and management of the taxon and its habitat.

12.2 Protection of population and habitat

3. Bellingen Shire Council (BSC) and determining authorities considering proposed developments and activities upstream and in the vicinity of known sites of the Bellinger River Emydura, and in areas of potential habitat, will consider potential impacts on the taxon, including impacts on

water quality, river sediment load and riparian vegetation. (*Objectives 4-6/Performance criteria 4-6*).

4. NPWS will recommend to relevant approval authorities that proposed logging activities on private lands upstream and in the vicinity of known sites of the Bellinger River Emydura, and in areas of potential habitat, will require riparian buffers and other relevant soil erosion and water quality protection measures equivalent to those observed by SFNSW. (*Objectives 4-6/Performance criteria 4-6*).
5. Identify areas of riparian vegetation that require remedial works upstream and in the vicinity of known sites of the Bellinger River Emydura, and in areas of potential habitat, and encourage and provide support to landowners undertaking measures to protect, manage and enhance riparian vegetation. (*Objectives 4-6/Performance criteria 4-6*).
6. Authorities with responsibility for management of the Bellinger River catchment will consider inclusion of protection of water quality and habitat values as primary strategic outcomes. (*Objectives 4-6/Performance criteria 4-6*).
7. NPWS will liaise with NSW Fisheries regarding riverine habitat management activities such as desnagging in the vicinity of known sites and in areas of potential habitat of the Bellinger River Emydura. (*Objective 6/Performance criterion 6*).
8. Monitoring and protection of water quality in the upper Bellinger River catchment will be supported. (*Objectives 5 and 6/Performance criteria 5 and 6*).
9. Control of foxes in the vicinity of known sites of the Bellinger River Emydura will be undertaken. The Bellinger River Emydura has been identified as a high priority species for fox control under the NSW Threat Abatement Plan for Predation by the Red Fox (NPWS in prep.) (*Objectives 4 and 6/Performance criteria 4 and 6*).

Outcome

Increased protection of taxon and its habitat.

12.3 Community awareness and involvement

10. Development and implementation of a community education and awareness program to encourage community awareness concerning the status of the Bellinger River Emydura and to provide

information concerning threats, and actions which can be taken to control threats. NPWS, in consultation with other authorities, will prepare a brochure for distribution in the local community with the following components:

- promote the Bellinger River Emydura as a flagship species for ecologically sustainable management of the Bellinger River catchment;
- provide information concerning the value and management of riparian vegetation;
- provide information concerning the potential impact on the Bellinger River Emydura of the release of pet or captive *Emydura macquarii* into the Bellinger River catchment;
- encourage and assist the community to identify and report additional sites supporting the Bellinger River Emydura; and
- provide information concerning the potential impact on the Bellinger River Emydura of line fishing, particularly the use of stainless steel hooks (which do not rust). (*Objectives 1, 2 and 4-6/Performance criteria 1, 2 and 4-6*).

11. Activities by the community to improve water quality in the Bellinger catchment will be encouraged. (*Objectives 1 and 5/Performance criteria 1 and 5*).

Outcome

Increased community awareness of the Bellinger River Emydura and involvement in its recovery.

13.0 Implementation

Table 1 allocates responsibility for the implementation of recovery actions specified in this plan to relevant government agencies for a period of five years from the time this recovery plan is adopted.

14.0 Preparation details

This document was prepared by Michael Murphy and Shane Ruming, Threatened Species Officers NPWS Northern Directorate in consultation with the Bellinger Catchment Management Committee. Background information and assistance was provided by Ross Sadler, Ricky-John Spencer, John Cann and Stephen Hull.

15.0 Review date

This Recovery Plan will be reviewed within five years of the date of publication.

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17.0 Acronyms used in this document

BCMC – Bellinger Catchment Management Committee

BSC – Bellinger Shire Council

CMB – Upper North Coast Catchment Management Board

DLWC – Department of Land and Water Conservation

EP&A Act – NSW *Environmental Planning and Assessment Act* 1979

EPBC Act – Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999

LEP – Local Environmental Plan

NPW Act – NSW *National Parks and Wildlife Act* 1974

NPWS – NSW National Parks and Wildlife Service

NVC Act – NSW *Native Vegetation Conservation Act* 1997

SFNSW – State Forests of NSW

TSC Act – NSW *Threatened Species Conservation Act* 1995

18.0 Implementation Tables

Table 1. Responsibility for implementation, timing and priority of recovery actions for five year life of plan. Priority is categorised as 1 (essential) or 2 (highly desirable).

Description	Responsibility for implementation	Timeframe	Priority
12.1 Survey and Research			
1. Monitoring of recruitment	NPWS	Life of Plan	1
2. Research into biology and ecology	NPWS	Years 1 and 2	2
12.2 Protect Populations and Habitat			
3. Consideration of species in environmental impact assessment	BSC and other approval authorities	Life of plan	1
4. Protect water quality in private logging operations	NPWS	Life of plan	1
5. Support protection of riparian vegetation by landholders	CMB, Landcare groups and other community groups	Life of plan	1
6. Water quality management	CMB, BSC and determining authorities	Life of plan	1
7. Management of riverine habitat	NPWS	Life of plan	1
8. Water quality monitoring	DLWC	Life of plan	2
9. Fox control	NPWS	Life of plan	2
12.3 Community Awareness			
10. Community awareness brochure	NPWS	Years 1 and 3	1
11. Community water quality protection	DLWC	Life of plan	1

Table 2. Estimated costs of implementing recovery actions. Costs presented are unsecured unless otherwise noted.

Tasks	Item	Year 1	Year 2	Year 3	Year 4	Year 5
Survey and Research	1. monitoring of recruitment	6027 ⁺	6027 ⁺	6027 ⁺	6027 ⁺	6027 ⁺
	2. research	5000	5000	-	-	-
Protect Populations and Habitat	3. environ. impact assessment	✓	✓	✓	✓	✓
	4. private logging protocols	✓	✓	✓	✓	✓
	5. riparian veg. protection	✓	✓	✓	✓	✓
	6. water quality management	✓	✓	✓	✓	✓
	7. riparian management	✓	✓	✓	✓	✓
	8. water quality monitoring	●	●	●	●	●
	9. fox control	12862	12862	12862	12862	12862
Community Awareness	10. community brochure	2000	-	2000	-	-
	11. water quality protection	●	●	●	●	●
Annual costs of implementing Plan		25889	23889	20889	18889	18889
Total cost of Recovery Plan		108445				

⁺ Funded through Fox Threat Abatement Plan

✓ No direct cost; however, relevant party or public authority must consider action

● Costs covered by agency core duties



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