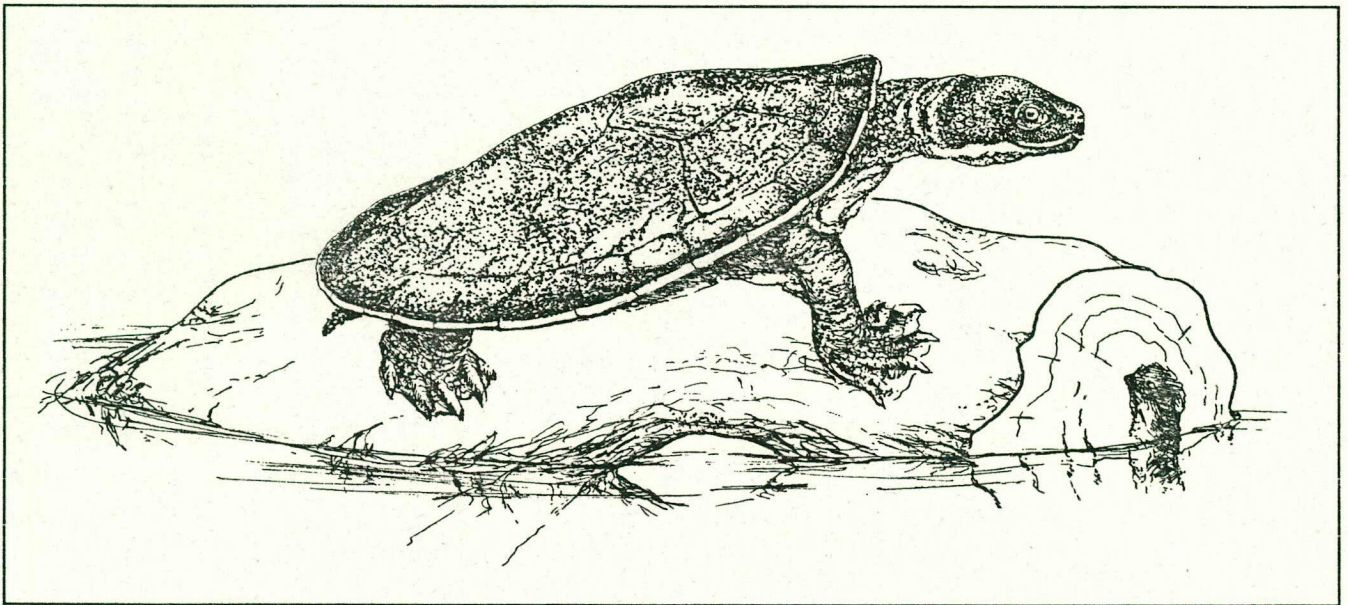




Bellinger River Emydura  
*Emydura macquarii*  
(Bellinger River form)  
Recovery Plan



Draft for Public Comment

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NSW National Parks and Wildlife Service  
43 Bridge Street  
(PO Box 1967)  
Hurstville NSW 2220  
Tel: 02 9585 6444  
[www.npws.nsw.gov.au](http://www.npws.nsw.gov.au)

For further information contact  
Threatened Species Unit,  
Conservation Programs and Planning Division,  
Northern Directorate.  
NSW National Parks and Wildlife Service  
Locked Bag 914  
Coffs Harbour NSW 2450  
Tel 02 6651 5946

Cover illustrator: Ann Sheppard

This plan should be cited as follows:

NSW National Parks and Wildlife Service (2000). Bellinger River *Emydura macquarii* (Bellinger River form) draft recovery plan.

ISBN 0 7313 6149 0

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# Bellinger River Emydura *Emydura macquarii* (Bellinger River form) 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, fauna and invertebrates. 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. The TSC Act includes specific requirements for both the matters to be addressed by recovery plans and the process for preparing recovery plans. This plan satisfies these provisions.

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

Department of Environment,  
Climate Change & Water NSW  
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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. 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.

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

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 georgesii*). 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. Originally known from a single site upstream from Thora (Cann 1993a; Cogger *et al.* 1993), the Bellinger River Emydura has now been reported from four sites on the upper Bellinger River, ranging downstream to the vicinity of Bellingen township (Cann 1998

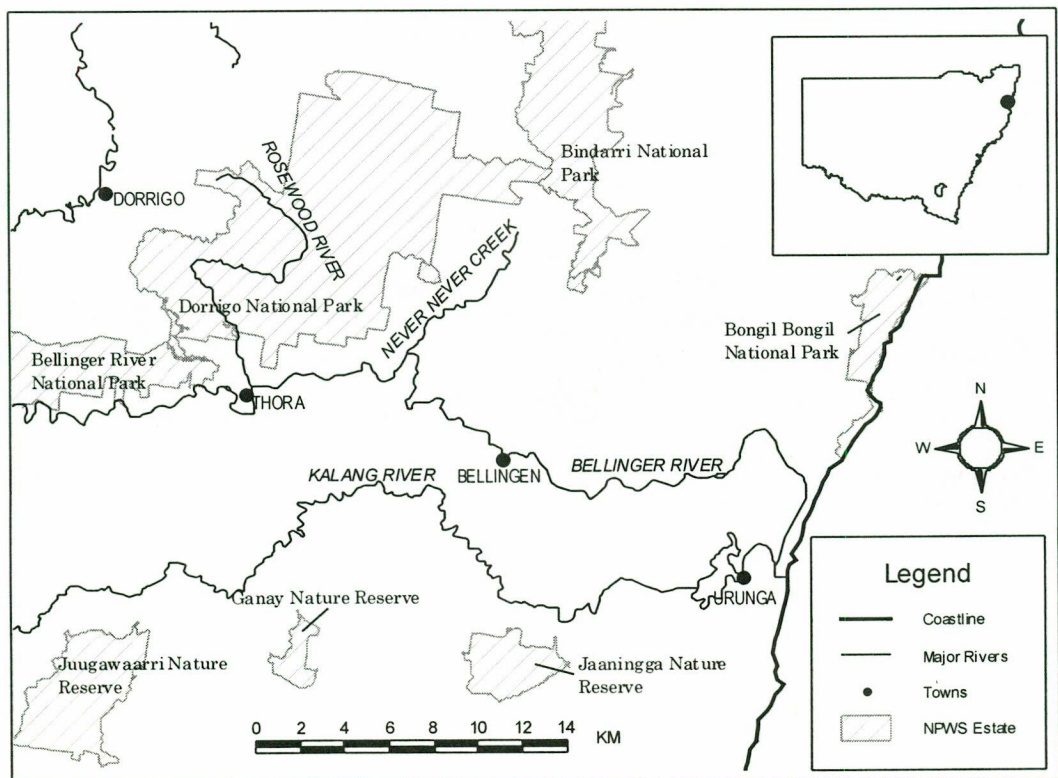


Figure 1. Bellinger River and associated tributaries.

Cann pers. comm. 1999) (Figure 1). Given that the Bellinger River Emydura has an apparently restricted distribution and a small total population, it is considered that targeted survey work in the Bellinger and associated rivers and streams should be undertaken to determine the full range of the taxon.

### 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 present at each of the four reported locations is unknown but is thought to be small, possibly less than 10 animals. At the best known location, near Thora, a total of only six individuals have been recorded (Cogger *et al.* 1993). 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

The Bellinger River Emydura is omnivorous with a diet including small crustaceans, aquatic insects, filamentous algae and possibly aquatic weed (Cann 1993a). The animals recorded near Thora on the upper Bellinger River occupy several long, deep pools in moderately broad reaches along a 200 metre section of the river (Cogger *et al.* 1993).

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 run-off 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 *Environment Protection and Biodiversity Conservation Act 1999*.

### 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.

#### 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.

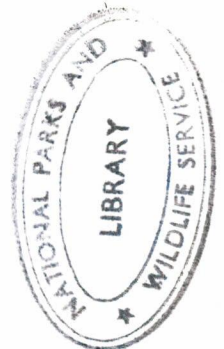
#### 6.2 Environmental assessment

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.

### 7.0 Management issues

#### 7.1 Threats

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;
- line fishing; and
- competition with the Bellinger River Elseya.

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, reduced stream flow through extraction of water and predation of nests by foxes *Vulpes vulpes* (Thompson 1983, Cann 1993a, Cann 1993b).

#### 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 would need to be allocated (Table 2). Implementation has been costed at \$17 000 (priority 1) and \$22 000 (priorities 1 and 2).

Submissions from the community regarding other likely social and economic consequences of implementing the actions in this recovery plan are welcome during the draft exhibition period.

#### 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

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 four sites (Cann 1998). Further targeted survey is required in the Bellinger River and associated waterways (Cogger *et al.* 1993; Cann 1998).

#### 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) has promoted a number of habitat protection measures on private lands, including the protection of riparian vegetation and protection of water quality. 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.

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 and Bellinger Local Environmental Plan 1990.

State Forests NSW (SFNSW) undertaking forestry activities 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 conditions negotiated for the Forest Agreement for the Lower North East Region (NSW NPWS and SFNSW 1999).

#### 8.4 Community awareness

The Bellinger 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.

### 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. Three additional sites have 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. Identification and survey of areas of potential habitat, incorporating community involvement, to identify any additional sites supporting the Bellinger River Emydura. (*Objective 2/Performance criterion 2*).
2. Monitoring of the recruitment of juveniles and subadults into the population at one or more sites. (*Objectives 3 and 6/Performance criteria 3 and 6*).
3. 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. (*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

4. Bellinger Shire Council 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*).
5. Bellinger Shire Council when considering 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*).
6. Identify areas of riparian vegetation that require remedial works upstream and in the vicinity of known sites of the Bellinger River Emydura, and encourage and provide support to landowners undertaking measures to protect, manage and enhance riparian vegetation. (*Objectives 4-6/Performance criteria 4-6*).

7. 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*).
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 supported. (*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. A brochure for distribution is to be prepared 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,
  - encourage and assist the community to identify and report additional sites supporting the Bellinger River Emydura,
  - 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, Threatened Species Officer NPWS Northern Directorate, in consultation with the Bellinger Catchment Management Committee. Background information and assistance was provided by Ross Sadlier, John Cann, and Stephen Hull.

#### 15.0 Review date

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

#### 16.0 References

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## 17.0 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
<b>12.1 Survey and Research</b>			
1. Survey for additional sites	NPWS and BCMC	Year 1	1
2. Monitoring of recruitment	NPWS	Years 2 and 4	1
3. Research into biology and ecology	NPWS and BCMC	Year 1	2
<b>12.2 Protect Populations and Habitat</b>			
4. Consideration of species in environmental impact assessment	Bellingen Shire Council and other approval authorities	Life of plan	1
5. Protect water quality in private logging operations	Bellingen Shire Council	Life of plan	1
6. Support protection of riparian vegetation by landholders	BCMC, Landcare groups and other community groups	Life of plan	1
7. Water quality management	Upper North Coast Catchment Management Board, Bellingen Shire Council and determining authorities	Life of plan	1
8. Water quality monitoring	DLWC	Life of plan	2
9. Fox control	NPWS and Rural Lands Protection Board	Life of plan	2
<b>12.3 Community Awareness</b>			
10. Community awareness brochure	NPWS	Years 1 and 3	1
11. Community water quality protection	DLWC	Life of plan	1

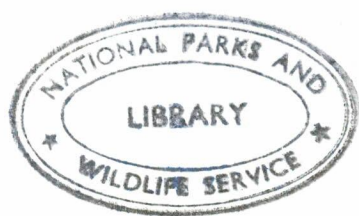
**Table 2.** Estimated costs of implementing recovery actions. Costs presented are unsecured unless otherwise noted.

Tasks	Item	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Survey And Research</b>	1. survey for additional sites *	5000	-	-	-	-
	2. monitoring of recruitment	-	4000	-	4000	-
	3. research into ecology *	5000	-	-	-	-
<b>Protect Populations And habitat</b>	4. environ. impact assessment	✓	✓	✓	✓	✓
	5. private logging protocols	✓	✓	✓	✓	✓
	6. riparian veg. Protection	✓	✓	✓	✓	✓
	7. water quality management	✓	✓	✓	✓	✓
	8. water quality monitoring	●	●	●	●	●
<b>Community Awareness</b>	9. fox control	●	●	●	●	●
	10. community brochure	2000	-	2000	-	-
	11. water quality protection	●	●	●	●	●
<b>Annual costs of implementing Plan</b>		12000	4000	2000	4000	-
<b>Total cost of Recovery Plan</b>		22000				

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

● Costs covered by agency core duties

\* Project in progress with joint funding (50:50 basis) from NPWS 1999/2000 recovery planning funding and BCMC



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43 Bridge Street  
Hurstville 2220  
(02)9585 6444