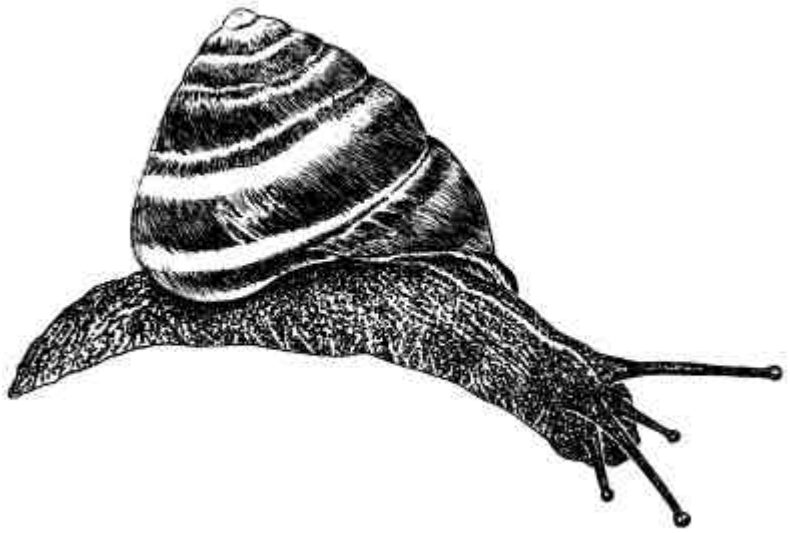
Declaration of critical habitat for Mitchell's Rainforest Snail (*Thersites mitchellae*) in Stotts Island Nature Reserve

(Pursuant to s. 44 and 47 of the *Threatened Species Conservation Act* 1995)



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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.

The TSC Act includes provision for the identification and declaration by the Minister of habitat that is critical to the survival of endangered species, populations and ecological communities (that is, those species, populations and ecological communities listed in Schedule 1 of the Act). The TSC Act includes specific requirements concerning the habitat eligible to be declared to be critical habitat, the process for identification of critical habitat, and the matters to which the Minister must have regard when considering a recommendation for critical habitat. This report satisfies these provisions.

This report describes our current understanding of the endangered Mitchell's Rainforest Snail, documents the critical significance of Stotts Island Nature Reserve for the survival of the species, and includes an assessment of the social and economic consequences of the declaration of critical habitat. This critical habitat declaration will make a significant contribution to the conservation and recovery of Mitchell's Rainforest Snail and its habitat.

Michael Wright
A/Director-General

Bob Debus MP
Minister for the Environment

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1.0 Introduction

The State listed endangered Mitchell's Rainforest Snail *Thersites mitchellae* is found only in remnant areas of lowland subtropical rainforest and swamp sclerophyll forest on the coastal plain between Ballina and Tweed Heads in north-east NSW. Stotts Island Nature Reserve, in the Tweed River near Murwillumbah, provides the largest single area of remaining habitat and largest known population of the species.

This report describes our current understanding of Mitchell's Rainforest Snail, documents the critical significance of Stotts Island Nature Reserve for the survival of the species, and includes an assessment of the social and economic consequences of declaration of Stotts Island Nature Reserve as critical habitat for Mitchell's Rainforest Snail under Part 3 of the *Threatened Species Conservation Act 1995* (TSC Act). The recommendation for critical habitat was prepared in accordance with sections 39 and 40 of the TSC Act and has been publicly notified and exhibited in accordance with section 41 of the TSC Act.

Identification and declaration of Stotts Island as critical habitat for the Mitchell's Rainforest Snail is identified as an essential (priority 1) recovery action in the approved Mitchell's Rainforest Snail recovery plan (NPWS 2001a). This is the first critical habitat declaration in NSW and will contribute significantly to the conservation and recovery of Mitchell's Rainforest Snail and its habitat. It will also greatly assist implementation of the TSC Act's critical habitat provisions across a range of endangered species and land tenures by increasing community awareness of these provisions and by establishing an administrative process to be followed.

Stotts Island Nature Reserve is also significant as the largest remaining area of lowland rainforest on floodplain on the NSW north coast (listed as an endangered ecological community under the TSC Act). Furthermore, it also provides habitat for other threatened fauna species, including the Wompoo Fruit-dove, Rose-crowned Fruit-dove, Osprey, Black Bittern and Black Flying-fox. Declaration of Stotts Island Nature Reserve as critical habitat for Mitchell's Rainforest Snail will provide added protection to all of the Island's significant natural heritage values.

2.0 Summary of the main statutory implications of critical habitat declaration

Habitat eligible to be declared critical habitat is the whole or any part or parts of the area or areas of land comprising the habitat of an endangered species, population or ecological community that is critical to the survival of the endangered species, population or ecological community (s37(1) TSC Act).

The declaration of critical habitat serves primarily as a trigger which ensures a rigorous assessment of development proposals and the mandatory involvement of NPWS in the planning and decision making processes. This is achieved by such statutory requirements as:

- The mapping of the declared area on the relevant Local Environmental Plan and Regional Environmental Plan (s.26 of the *Environmental Planning and Assessment Act 1979* (EP&A Act)).

- The maintenance of a register of all declarations (s.55(1) of the TSC Act).
- The requirement that a person must not, by an act or an omission, do anything that causes damage to any critical habitat (s.118C of the *National Parks and Wildlife Act 1974* (NPW Act)). However, it is a defence to a prosecution for an offence against this section of the NPW Act if the accused proves that the act constituting the offence was:

  (a) authorised to be done, and was done in accordance with, a licence granted under the NPW Act or under Part 6 of the TSC Act, or

  (b) essential for the carrying out of development in accordance with a development consent within the meaning of the EP&A Act, or

  (c) essential for the carrying out of an activity, whether by a determining authority or pursuant to an approval of a determining authority within the meaning of Part 5 of the EP&A Act if the determining authority has complied with the Part, or

  (d) authorised to be done by or under the *Rural Fires Act 1997* or the *State Emergency and Rescue Management Act 1989* and was reasonably necessary in order to avoid a threat to life or property; or

  (e) carried out under an approved Property Management Plan or as a routine agricultural activity.
- Section 92 of the TSC Act makes it mandatory for all applications for a licence to undertake an action on land that is critical habitat, to be accompanied by a Species Impact Statement prepared in accordance with the TSC Act.
- A planning authority (eg. local council) must have regard to the register of critical habitat when exercising any of its functions under the EP&A Act (s5B(1) of the EP&A Act).
- A development proposed on land which is critical habitat may not be considered an exempt development (s.76 of the EP&A Act). Accordingly, all developments occurring on land that is Critical Habitat either require a Section 91 licence under the TSC Act or must go through the development consent process under the EP&A Act.
- A development may not be considered a complying development if it occurs on land that is critical habitat (s.76A(5) of the EP&A Act). This means that developments proposed on land that is critical habitat may not be approved by an accredited certifier, but must be approved by the consent authority.
- Any application for a development on land that is, or is a part of, critical habitat must be accompanied by a Species Impact Statement prepared in accordance with the TSC Act (s.78A(8) of the EP&A Act). In such circumstances, development consent must not be granted without the concurrence of the Director-General of National Parks and Wildlife (s79B(3) of the EP&A Act). Where a Minister is the consent authority, the Minister administering the TSC Act must be consulted.
- When conducting an assessment under part 5A of the EP&A Act, consent authorities are required to consider whether the activity or development will affect critical habitat. Consequently, activities and developments need not be carried out on land that is critical habitat in order to trigger a SIS if they may have an indirect impact.
- A determining authority must not carry out an activity, or grant an approval in relation to an activity that is in respect of land that is, or is a part of, critical habitat unless a Species Impact Statement, or an Environmental Impact Statement that includes a Species Impact Statement, has been prepared in accordance with the TSC Act. Section 112C of that Act ensures that in such circumstances a determining authority (with the exception of where the authority is a Minister) will not carry out, or grant an approval to carry out, an activity without the concurrence of the

Director-General of National Parks and Wildlife. Where a Minister is the determining authority he or she must only consult with the Minister administering the TSC Act.

- The Director-General of Urban Affairs and Planning must consult with the Director-General of National Parks and Wildlife before preparing a draft State Environmental Planning Policy, or an Environmental Study or a draft Regional Environmental Plan, if, in the opinion of the Director-General, critical habitat will or may be affected by the draft policy, environmental study or draft plan (s.34A(1) of the EP&A Act).
- Councils must also consult with the Director-General of National Parks and Wildlife before preparing an Environmental Study, or a draft Local Environmental Plan (LEP), if, in the opinion of the council, critical habitat will or may be affected by the Environmental Study or draft plan (s.34A(2) of the EP&A Act).
- The *Native Vegetation Conservation Act 1997* (NVC Act) does not operate on land which is declared critical habitat (s.9(k)). However, the initiator of a Regional Vegetation Management Plan must consult with the Director-General of National Parks and Wildlife regarding critical habitat before preparing the plan (s.26(1) NVC Act).

It is important to note that the declaration of critical habitat does not necessarily prohibit activities in declared areas. The TSC Act, however, does authorise the making of regulations which may prohibit or regulate certain actions on declared critical habitat. At this stage the NPWS has not developed a policy outlining the circumstances in which regulations might be considered appropriate.

In addition to the above statutory implications, declaration of critical habitat can make a significant contribution to raising community awareness of the status of an endangered species and the significance of a particular area or areas for the species' survival. As noted above, this is the first critical habitat declaration in New South Wales, and will assist in raising community awareness of the critical habitat provisions of the TSC Act. It will also assist in the establishment of an administrative process to be followed for critical habitat identification and declaration for other endangered species, populations and ecological communities across a range a land tenures.

Declaration of critical habitat for Mitchell's Rainforest Snail in Stotts Island Nature Reserve does not indicate that additional areas of habitat for the species are not essential or critical to the recovery of the species.

3.0 Process for identification and declaration of critical habitat

Part 3 of the TSC Act makes the Director-General of National Parks and Wildlife (D-G) responsible for identifying (where this is possible) habitat that is critical to the survival of endangered species, populations and ecological communities (Schedule 1 of the TSC Act). The process to be followed in identifying and declaring critical habitat is summarised below:

1. The D-G must consult with the NSW Scientific Committee before preparing a recommendation concerning the identification of critical habitat (s. 39 TSC Act).
2. After considering the Scientific Committee's advice, the D-G must prepare a recommendation for identification of critical habitat (s. 40 TSC Act).
3. The D-G must provide a copy of the recommendation to the Scientific Committee, give notice of the recommendation to all affected persons, and notify the community by publishing notice of the recommendation in the Gazette, a state newspaper and a local newspaper (s. 41 TSC Act).

4. The D-G must consider all written submissions received and may amend the recommendation to take account of submissions (s. 42 TSC Act).
5. The D-G must then forward the final recommendation and summary of submissions to the Minister for the Environment (s. 43 TSC Act).
6. The Minister is responsible for considering the recommendation in light of all submissions received, and must take into account the likely social and economic consequences of any declaration. The Minister must consult with other Ministers responsible for any affected public authority, and may request the D-G to amend the recommendation (s. 44-46 TSC Act).
7. The Minister must then approve or refuse the recommendation or refer it back to the D-G for further consideration (s. 47 TSC Act).
8. If the recommendation is approved, notification of the declaration is published in the Gazette and in a state and local newspaper and affected persons are notified (s. 48 TSC Act). A map of the critical habitat is also published in the Gazette (s. 53 TSC Act).
9. The D-G must then serve a copy of the map of critical habitat on persons listed in s. 54 of the TSC Act.

With respect to the identification and declaration of Stotts Island Nature Reserve critical habitat for Mitchell's Rainforest Snail, the following actions have been undertaken in accordance with the above process:

- The NPWS prepared an assessment report for critical habitat for Mitchell's Rainforest Snail on Stotts Island in July 2000 (NPWS 2000a). This report was forwarded to the Scientific Committee for comment, with the draft recovery plan on public exhibition (step 1 above).
- The NPWS considered the advice subsequently provided by the Scientific Committee, and public submissions received through public exhibition of the draft recovery plan, and prepared a recommendation report in June 2001 (NPWS 2001b) (step 2 above).
- The recommendation report was placed on public exhibition from 2 July to 20 August 2001, with notice of the recommendation published in the Government Gazette, Sydney Morning Herald and Tweed Daily News on 29 June 2001 Copies of the recommendation report were available for inspection at NPWS Tweed Area Office Murwillumbah, NPWS Northern Directorate Office Coffs Harbour, NPWS Head Office Hurstville and the NPWS internet web site. Copies of the recommendation report were provided to the NSW Scientific Committee, Department of Urban Affairs and Planning and Tweed Shire Council on 29 June 2001 (step 3 above).
- Six public submissions were received during or following public exhibition. All submissions supported the recommendation. The submissions have been reviewed and no amendment of the recommendation was necessary (step 4 above).
- A final recommendation and summary of public submissions was forwarded to the Minister for consideration in September 2001 (step 5 above).
- The recommendation was considered by the Minister and approved in October 2001(steps 6 and 7 above).

Following this declaration, notification of the declaration will be published in the Gazette and in a state and local newspaper and affected persons notified in accordance with s. 48 of the TSC Act. A map of the critical habitat will also published in the Gazette and a copy of the map served on persons listed in s. 54 of the TSC Act.

4.0 Subject species of declaration

4.1 Species

Mitchell's Rainforest Snail *Thersites mitchellae* (Cox, 1864).

4.2 Status

Mitchell's Rainforest Snail was listed as endangered under the TSC Act in March 1997 (NSW Scientific Committee 1997). It is also recognised as endangered internationally through listing on the *2000 IUCN Red List of Threatened Species* (IUCN Species Survival Commission 2000), in the category ENC2a. The species is not currently listed on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), but was nominated by the NPWS in September 2001 for listing as endangered under that Act.

4.3 Species description

Mitchell's Rainforest Snail is a large terrestrial gastropod in the Family Camaenidae and Subfamily Camaeninae. Three species are currently recognised in the genus: *Thersites mitchellae* (Cox, 1864) from lowland subtropical rainforest and swamp sclerophyll forest with a rainforest understorey between the Richmond and Tweed Rivers in north-east NSW, *Thersites novaehollandiae* (Gray, 1834) from temperate and subtropical rainforest from Barrington Tops to the NSW/Queensland border and *Thersites richmondiana* (Reeve, 1852) from upland temperate and subtropical rainforest between the McPherson Range on the NSW/Queensland border and the Conondale Range in south-east Queensland (Bishop 1978; NPWS 2001a).

Mitchell's Rainforest Snail (Figure 1) has a large shell up to 55 mm wide and 50 mm high, with a strongly elevated spire giving it a triangular profile, and a thickened, reflected lip. The shell is deep reddish chestnut to black in colour with two prominent yellow bands, and has a very fine microsculpture which gives it a satin appearance when held in bright light. The body colour is black with a thin lighter line on the dorsal midline. Live weight is approximately 25 g.

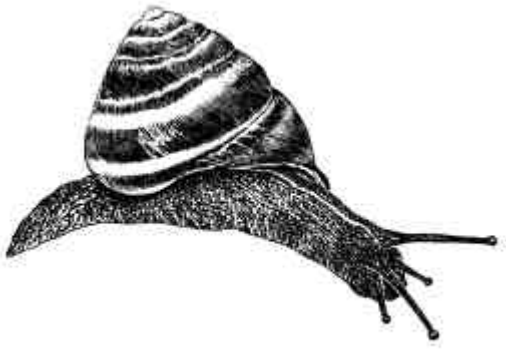

Figure 1 Mitchell's Rainforest Snail

4.4 Distribution

The current range of Mitchell's Rainforest Snail remains approximately the same as its historical distribution, the coastal plain between the Richmond and Tweed Rivers. Within this range, however, land clearing has been extensive and Mitchell's Rainforest Snail is now restricted to isolated relictual

populations in remnant areas of habitat (Stanisic 1998; NPWS 2001a). Recent records of the species are shown in Figure 2.

4.5 Habitat

Mitchell's Rainforest Snail is restricted to lowland subtropical rainforest and swamp sclerophyll forest with a rainforest understorey on alluvial soils with a basaltic influence (Stanisic 1998; NPWS 2001a). It is apparently absent from other rainforest types in the area, such as littoral rainforest (Stanisic 1998). This type of correlation with particular rainforest communities is common in many land snail species in eastern Australia (Stanisic 1994).

Lowland rainforest and swamp sclerophyll forest in the Tweed-Richmond area have been extensively cleared for agriculture and urban development and now occur only in small remnants. Lowland rainforest on floodplain in the NSW North Coast bioregion, including the habitat of Mitchell's Rainforest Snail, was listed as an endangered ecological community under schedule 1 part 3 of the TSC Act in August 1999 (NSW Scientific Committee 1999).

Most of the sites where Mitchell's Rainforest Snail is known to survive are located on slightly elevated ground on the margins of coastal wetlands. This may be an artefact of land clearing patterns or indicate a real microhabitat preference (NPWS 2001a). Breeding populations of Mitchell's Rainforest Snail can persist in narrow strips of remnant rainforest (Stanisic 1998), although the longer-term viability of populations at such sites is uncertain.

4.6 Life history

Little information is available on the ecology of Mitchell's Rainforest Snail. Its restriction to rainforest and moist forest, a trait shared with 90% of eastern Australian land snail species (Stanisic 1994), suggests a dependence on high moisture levels, low fire frequency and a well developed leaf litter layer. Microhabitat data for Mitchell's Rainforest Snail includes records of live animals found by day sheltering under palm fronds on the ground, inside dead palm frond stems, under leaf litter at the base of trees, and under bark in fig *Ficus* trees (Stanisic 1998), and active at night on the surface of leaf litter (Stanisic 2000; Murphy pers. obs.). Stanisic (1998) concluded that Mitchell's Rainforest Snail is probably terrestrial and that juveniles are possibly arboreal. The related *T. novaehollandiae* is active at night, foraging on the rainforest floor and up to six metres high on tree trunks, and is most obviously active on warm, wet nights (Murphy pers. obs.).

Mitchell's Rainforest Snail is herbivorous and is thought to feed on leaf litter, fungi and lichen (Stanisic 2000). Breeding behaviour has only been observed once, with a clutch of 70 eggs laid below the surface of leaf litter (Murphy pers. obs.). Key habitat components for the species are a well-developed leaf litter layer (providing food, shelter and breeding sites) and an intact forest canopy (maintaining a moist microclimate and providing a source of leaf litter).

4.7 Extent of decline

Judging from collections of the species last century, Mitchell's Rainforest Snail was previously common within its range but has since declined in abundance (Australian Museum 2001). The current range of Mitchell's Rainforest Snail remains approximately the same as its historical distribution, the coastal plain between the Richmond and Tweed Rivers. Within this range, however, land clearing has been extensive, with at least 90% of the original lowland rainforest and swamp sclerophyll forest destroyed. Mitchell's Rainforest Snail is now restricted to remnant areas of habitat, many of which are of limited size.

4.8 Summary of major threats

The major cause of the decline of Mitchell's Rainforest Snail is habitat destruction (NSW Scientific Committee 1997; Stanisic 1998; NPWS 2001a; Stanisic 2000). Land clearing for agriculture and urban development across the species' range has been extensive, and many of the small areas of surviving habitat remain at risk of clearing. The habitat value of small remnants is typically judged from a large vertebrate-focussed perspective, and the conservation value of these sites for invertebrate species is often not appreciated (Ponder 1997).

The majority of known remaining populations occurs in small areas of remnant rainforest including narrow strips of rainforest bordering coastal wetlands. These small remnant areas, with a high perimeter to area ratio, are at risk from edge effects, including desiccation, habitat disturbance, frequent fire and invasion by exotic weeds and feral animals. There is little data available on the impact of these factors on land snails (Ponder 1997), but they are likely to be adverse (NPWS 2001a).

Predation by birds and introduced mammals has been identified as a possible threat to the species (NSW Scientific Committee 1997; Australian Museum 2001). Mitchell's Rainforest Snail is preyed upon by the Noisy Pitta *Pitta versicolor* in Stotts Island Nature Reserve (Stanisic 2000). Introduced rats feed on land snails (Sherley *et al*. 1998; Ponder and Chapman 1999), and may prey on Mitchell's Rainforest Snail.

5.0 Subject area of declaration

5.1 Location

Stotts Island (28° 16.5` S; 153° 30` E) (Figures 3 and 4) is situated in the lower reaches of the Tweed River 12 km north-east of Murwillumbah on the far north coast of New South Wales.

5.2 Description

Stotts Island is approximately 165 ha in area and was declared a Nature Reserve under the NPW Act on 25 June 1971 (NPWS 2001c).

The Island is low lying and consists of Quaternary and Recent alluvium. It is geomorphologically active with continuous reshaping through erosion and deposition of its perimeter. Despite the low relief the Island's topography is complex with a series of natural drainage lines and channels crossing the Island. The Island is separated from the mainland by a narrow canal on the south side of the Island (NPWS 2001c).

The vegetation of Stotts Island can be broadly divided into the following categories (Stanisic 2000) (Figure 5):

- tall fringing forests on the west, south and eastern edges of the Island;
- stands of Hoop Pine *Araucaria cunninghamii* forest located mainly at the western end;
- medium mixed forest surrounding the swamp forests at the southern end;
- large areas of swamp forests consisting of Melaleuca and palms;
- extensive palm glades;
- treeless sedge swamps; and
- mangrove/Swamp Oak *Casuarina glauca* forest.

Subtropical rainforest, incorporating the tall fringing forest, Hoop Pine forest, medium mixed forest and palm glades, cover much of the Island. The rainforest includes three distinct suballiances of the *Argyrodendron trifoliatum* alliance: suballiance 2 (*Toona-Flindersia*), suballiance 3 (*Cryptocarya obovata-Dendrocnide excelsa-Ficus* spp.-*Auracaria*) and suballiance 6 (*Archontophoenix-Livistona*) (Floyd 1990a, 1990b). The *Argyrodendron trifoliatum* alliance is the most structurally complex rainforest alliance in NSW and is distributed in north-eastern NSW and south-eastern Queensland. It generally occurs at low altitudes on fertile alluvial flats, and to a lesser extent at altitudes to approximately 600 m AHD. It occurs on the best farming land and has almost been completely destroyed in all but the most inhospitable areas (Floyd 1990a, 1990b). The approximately 120 hectare area of the rainforest alliance occurring on the alluvial flats of Stotts Island is unique.

5.3 Status of Mitchell's Rainforest Snail on Stotts Island

The status and occurrence of Mitchell's Rainforest Snail and its habitat on Stotts Island was examined in a joint project by the NPWS and Queensland Museum in December 1999 (Stanisic 2000). Mitchell's Rainforest Snail was recorded at all eight sites examined (Figure 5). Stanisic (2000) considered that the subtropical rainforest alliances on Stotts Island (*viz*. the tall fringing forest, medium mixed forest, hoop pine forest and palm glades) comprised primary habitat for the species. Assessment of other recent sites of Mitchell's Rainforest Snail, including swamp sclerophyll forest near Cumbebin Wetland at Byron Bay, indicates that the swamp forest on Stotts Island may also be suitable as secondary habitat.

Three key factors were considered by Stanisic (2000) to indicate the presence of a viable population of the species on the Island:

- the presence of live sub-adults and juveniles indicating a breeding population;
- the presence of large numbers of dead shells indicating a relatively large population may yet be present; and

- the presence of a diverse complement of other land snail species indicating that the habitat is conducive to the maintenance of a healthy land snail community.

Stotts Island is the last major remnant of subtropical floodplain rainforest in NSW (NPWS 2001c), and supports the largest known population of Mitchell's Rainforest Snail and largest remaining area of suitable habitat (Stanisic 2000; NPWS 2001a). Unlike many of the recent sites where Mitchell's Rainforest Snail has been recorded, which are small in area and considered marginal, the population status of the species on Stotts Island is considered good. Stotts Island has approximately 120 ha of lowland subtropical rainforest present (Floyd 1990) and an estimated Mitchell's Rainforest Snail population of several hundred snails (Stanisic 2000).

Stanisic (2000) concluded that Stotts Island was pivotal to the continued survival of Mitchell's Rainforest Snail and recommended identification of the Island as critical habitat for the species.

5.4 Existing conservation measures on Stotts Island

The gazettal of Stotts Island as a Nature Reserve in 1971 (Stotts Island Nature Reserve) provides protection to the Island from undesirable land uses. The approved Stotts Island Nature Reserve Plan of Management (NPWS 2001c) provides objectives and actions for the management of the Reserve's values. The plan includes reference to Mitchell's Rainforest Snail and supports the proposal to identify Stotts Island as critical habitat for the species. The approved plan proposes to continue the current management strategy of minimising public visitation to the Reserve to protect its ecological integrity (NPWS 2001c).

Major weed infestations of Lantana *Lantana camara*, Madeira Vine *Anredera cordifolia* and Catsclaw Creeper *Macfadyena unguis-cati* occur on Stotts Island (NPWS 2001c). A weed control plan has been prepared for the Reserve and will be implemented under the Plan of Management.

5.5 Area declared to be critical habitat

This declaration is for all of Stotts Island Nature Reserve as critical habitat for Mitchell's Rainforest Snail. It thereby incorporates all known sites for the species in the Reserve, all mapped areas of subtropical rainforest on the Island providing primary habitat, all mapped areas of swamp forest on the Island providing secondary habitat, as well as additional smaller areas of habitat below the current map's resolution. The inclusion of the entire Reserve in the critical habitat area also provides a buffer to afford protection to core habitat areas and allows scope for future development of additional habitat on Stotts Island through ongoing geomorphological processes. Declaration of the entire Nature Reserve as critical habitat will also enable simple and accurate identification of the critical habitat boundary in the field and in the Tweed LEP and North Coast REP.

6.0 Justification of site selection

In the USA, Sparrow and Wight (1975) defined critical habitat as those essential elements within the range of the taxon that provide adequate food, cover, and water so as to allow the taxon to reproduce at a sufficient rate such that reproduction balances mortality over the long-term, special niche requirements are met, and required distribution and disperal patterns are provided for. In addition, critical habitat should also allow for maintenance of genetic diversity necessary for long-term evolutionary development.

In assessing what is critical habitat the following factors should be taken into account (US Federal *Endangered Species Act* Regulations):

- sufficient space for individual and population growth, and for normal behaviour;
- sufficient food, water, air, light, minerals, or other nutritional or physiological needs;
- sufficient cover or shelter;
- sufficient sites for breeding, reproduction, rearing of offspring;
- sufficient habitats that are protected from disturbance or are representative of the historic, geographical and ecological distributions of a species.

Whilst formerly common, Mitchell's Rainforest Snail is now known to occur as a large population in a large area of habitat only in Stotts Island Nature Reserve. It is therefore considered that the protection and maintenance of the habitat on Stotts Island is essential to the species' ultimate survival. A local catastrophe affecting Stotts Island would make the species extremely vulnerable to extinction.

Although the core habitat for Mitchell's Rainforest Snail is contained within the mapped areas of rainforest communities on the Island, additional smaller areas are likely to occur elsewhere on the Island at a resolution below that of the currently available mapping. Furthermore, swamp forest areas on the Island are considered likely to provide secondary habitat.

The Mitchell's Rainforest Snail population on Stotts Island faces the following potential threats: accidental fire, feral animal introduction, weed invasion, and habitat disturbance. Declaration of the entire island as critical habitat provides greater scope for the exclusion of potential threats and the integrated management of this species. The declaration of Stotts Island as critical habitat will lend further weight to the NPWS response to inappropriate development proposals for the Reserve.

Although Mitchell's Rainforest Snail has been recently recorded at a number of additional sites between Lennox Head and Banora Point, it is not possible at this point in time to recommend critical habitat for areas utilised outside Stotts Island. Most of the additional sites are of small extant with less than three known snails (Stanisic 1998). In contrast, Stotts Island Nature Reserve provides approximately 120 ha of primary habitat for an estimated population of several hundred snails (Stanisic 2000). Further research is necessary to investigate the occurrence and status of other Mitchell's Rainforest Snail populations. Whilst it is unlikely that any areas of equal or greater significance than Stotts Island will be found, it should be noted that the declaration of critical habitat over Stotts Island in no way implies that other areas are not critical to the continued survival of Mitchell's Rainforest Snail, and the NPWS proposes assessment of additional areas of habitat as critical habitat for Mitchell's Rainforest Snail (NPWS 2001a).

7.0 Social and economic consequences of declaration of critical habitat

The TSC Act (Section 40(2)) specifies that the Director-General of National Parks and Wildlife must consider the likely social and economic consequences of making a recommendation for declaration of critical habitat by the Minister for the Environment.

In addition Section 44(1)(a) specifies that the Minister must have regard to the likely social and economic consequences of a declaration of critical habitat and, further, the likely consequences for landholders of, or other persons having an interest in, or on lawful uses of, the land (s44(1)(b)). The Minister must also consider whether, consistent with the principles of ecologically sustainable development, the recommendation might be amended to avoid or lessen any adverse consequences of the making of a declaration of critical habitat.

The D-G and the Minister must therefore be able to demonstrate that they have attempted to identify and consider all relevant economic and social consequences of the declaration of critical habitat. The first stage is to identify the issues, and secondly to consider the likely social and economic consequences of these issues. Finally, for those consequences determined to be significant and adverse, the D-G must consider if there are ways to minimise these consequences.

To assist this process, all the legislative and administrative issues associated with the declaration of critical habitat have been identified within this document. For each issue the likely social and economic consequences have been identified as they relate to the declaration of critical habitat on Stotts Island.

7.1 Legislative and administrative consequences of declaring critical habitat

7.1.1 Local Environmental Plan, Regional Environmental Plan or State Environmental Planning Policy.

If land declared as critical habitat is land to which a Local Environmental Plan, Regional Environmental Plan or State Environmental Planning Policy applies, the plan must be amended by the relevant Council, and the Department of Urban Affairs and Planning in a manner that identifies the land that is declared as critical habitat.

Tweed Shire Council will be required to amend their Local Environmental Plan. The Department of Urban Affairs and Planning will be required to amend the North Coast Regional Environmental Plan.

7.1.2 Developments or activities requiring consent or approval under the *Environmental Planning and Assessment Act 1979*.

Developments or activities which require consent or approval under the EP&A Act which are proposed on land that is, or is part of, critical habitat, automatically require the preparation of a species impact statement (SIS) and the concurrence of the D-G or in some cases, consultation with the Minister for the Environment.

It should be noted that the standard assessment processes under Part 4 & 5 of the EP&A Act (where an area is not declared as critical habitat) require a SIS and the concurrence of the D-G or the Minister of the Environment if a development or activity is likely to have a significant impact on an endangered species, population, or ecological community. It should also be noted that, according to s111(4) of the TSC Act, despite anything in the TSC Act or the EP&A Act (including critical habitat) the D-G may, having regard to the circumstances of a particular case, dispense with the requirements for a SIS in the particular case if the D-G is satisfied that the impact of the activity concerned will be trivial or negligible.

An economic consequence, which would be borne by the proponent of a proposed development or activity (most likely to be the NPWS, since the proposed critical habitat is within the Stotts Island Nature Reserve), would be the cost and time associated with the preparation and processing of a SIS for any proposed development or activity on the site (where the impact is not trivial or negligible). The cost to the NPWS of preparation of a SIS would be anticipated to be approximately $30 000. The Nature Reserve has been gazetted on the basis of protecting the island's significant natural heritage values and therefore the NPWS is highly unlikely to consider undertaking any development or activity that will adversely impact on the habitat. The Plan of Management prepared for Stotts Island Nature Reserve supports the proposed identification of the Island as critical habitat (NPWS 2001c). The NPWS does propose to undertake conservation management activities including weed control in Stotts Island Nature Reserve (NPWS 2001c). Such activities will be assessed through a Review of Environmental Factors and will be designed and undertaken in such a manner as to ensure that any adverse impacts on Mitchell's Rainforest Snail and its habitat are only trivial or negligible. In the event that proposed conservation management activities are determined to have greater potential impacts on Mitchell's Rainforest Snail or its habitat, a SIS will be required.

7.1.3 Consent or determining authority

When a consent or determining authority is deciding whether a proposed development or activity is likely to have a significant effect on threatened species, populations or ecological communities or their habitats, it must consider whether critical habitat will be affected by the proposal.

The D-G is the determining authority for any development or activity proposed on Stotts Island and is highly unlikely to consider undertaking any development or activity that will adversely impact on the habitat. As noted above, the NPWS does propose to undertake conservation management activities including weed control in Stotts Island Nature Reserve (NPWS 2001c). Such activities will be designed and undertaken in such a manner as to ensure that any adverse impacts on Mitchell's Rainforest Snail and its habitat are only trivial or negligible. Where proposed conservation management activities are determined to have greater potential impacts on Mitchell's Rainforest Snail or its habitat, a SIS will be required.

7.1.4 Register of critical habitat

All consent authorities must have regard to the register of critical habitat kept by the D-G when exercising their functions under the EP&A Act.

An economic consequence borne by the NPWS is the administration and maintenance of the register of critical habitat. This central register will be maintained by the NPWS Head Office and will include printed and electronic copies of critical habitat assessment reports, declarations, maps of critical habitat and other relevant material. A list of areas declared as critical habitat will be maintained on the NPWS internet website.

7.1.5 Section 91 Licence

A SIS must be submitted with the licence application for actions which require licensing under section 91 of the TSC Act, and which are proposed for land that is, or is part of, critical habitat.

It should be noted that the standard assessment processes under section 91 of the TSC Act (where an area is not declared as critical habitat) require a SIS if an action is likely to have a significant impact on an endangered species, population, or ecological community. It should also be noted that, according to s111(4) of the TSC Act, despite anything in the TSC Act or the EP&A Act (including critical habitat) the D-G may, having regard to the circumstances of a particular case, dispense with the requirements for a SIS in the particular case if the D-G is satisfied that the impact of the activity concerned will be trivial or negligible.

The NPWS will undertake scientific research and management within the area identified as critical habitat, but these actions will only be undertaken if there is likely to be no adverse impacts on the critical habitat.

7.1.6 Property management plans

Where a landholder is preparing a property management plan under section 91 of the TSC Act, the plan should identify whether the property contains land that is or is part of critical habitat.

The NPWS does not intend to prepare a property management plan for this Nature Reserve. The approved Plan of Management prepared for Stotts Island Nature Reserve supports the proposed identification of the Island as critical habitat (NPWS 2001c).

7.1.7 Recovery plan

A recovery plan must identify any critical habitat declared in relation to the threatened species, population or ecological community which is the subject of the plan and state what must be done to protect that critical habitat.

The NPWS is responsible for the preparation of recovery plans and has prepared a recovery plan for Mitchell's Rainforest Snail which was approved by the Minister in June 2001 (NPWS 2001a). This recovery plan identifies the identification and declaration of Stotts Island Nature Reserve as critical habitat for the species as a high priority action. There is no additional social and economic

consequence for the inclusion of this consideration as protection of the significant population and area of habitat on Stotts Island is a key strategy for the recovery of this species.

7.1.8 Public authorities

Public authorities must have regard to critical habitat if the land it owns or controls contains critical habitat. The public authority must also have regard to critical habitat when exercising its functions in relation to the land.

The NPWS manages the Stotts Island Nature Reserve. Current NPWS management is focused on research, environmental management and weed control (NPWS 2001c). There is no additional social and economic consequence of declaring this area as critical habitat as the NPWS is currently actively managing and maintaining the area identified as critical habitat. As noted above, the NPWS does propose to undertake conservation management activities including weed control in Stotts Island Nature Reserve (NPWS 2001c). Such activities will be designed and undertaken in such a manner as to ensure that any adverse impacts on Mitchell's Rainforest Snail and its habitat are only trivial or negligible. Where proposed conservation management activities are determined to have greater potential impacts on Mitchell's Rainforest Snail or its habitat, a SIS will be required.

7.1.9 *Native Vegetation Conservation Act* 1997

According to s26 of the NVC Act, the D-G must be consulted before the preparation of a draft regional vegetation management plan in regard to critical habitat, endangered species, populations, ecological communities and their habitats.

7.1.10 Regulations

Regulations may be made to prohibit or regulate the carrying out of specified actions on specified critical habitat.

The economic and social consequences of any potential regulations are unknown. No regulations for the critical habitat on Stotts Island are currently proposed.

7.1.11 Restoration of critical habitat

Section 118E of the NPW Act specifies that the Court may order the offender to restore critical habitat or habitat of endangered species, populations or ecological communities.

There is no additional economic consequence for any individual/s who are ordered to restore critical habitat, as restoration of habitat can currently be ordered where any individual/s damages the habitat of endangered species, populations, or ecological communities.

7.1.12 Damage to critical habitat

Section 118C (1) of the NPW Act states that "a person must not, by an act or an omission, do anything that causes damage to any critical habitat". In respect to damaging critical habitat without a

defence to a prosecution, the penalty is 2000 penalty units ($220,000) or two years imprisonment or both.

Section 118D (1) of the NPW Act states that "a person must not, by an act or an omission, do anything that causes damage to any habitat (other than a critical habitat) of a threatened species, population or ecological community if the person knows that the land concerned is habitat of that kind". In respect to damaging habitat of a threatened species, population or ecological community without a defence to a prosecution, the penalty is 1000 penalty units ($110,000) or one year imprisonment or both for damage to the habitat of a threatened species.

The economic consequence of declaring critical habitat in this regard is to increase the penalty from 1000 penalty units ($110,000) or one year imprisonment or both to 2000 penalty units ($220,000) or two years imprisonment or both.

7.2 Social consequences

The NPWS is the sole landholder of Stotts Island and, as such, is the authority responsible for the management of the island. The declaration of critical habitat on Stotts Island has been incorporated into the approved Plan of Management (NPWS 2001c).

Visitor access is not currently provided to Stotts Island Nature Reserve, to protect the Reserve's significant natural heritage values (NPWS 2001c). Public visitor access to the Island is considered to be adverse to Mitchell's Rainforest Snail due to the risk of trampling of and disturbance to habitat, increased risk of fire and introduced predators, and spread of weeds (Stanisic 2000). The approved Plan of Management proposes to continue the management strategy of not encouraging public access visitation and promotion of the adjacent Bruce Chick Park as an appropriate recreation and interpretive facility (NPWS 2001c). Negligible adverse social impacts are anticipated as restrictions on visitation are already well established.

Community education initiatives and interpretative material are likely to be strengthened by the declaration of critical habitat on Stotts Island. The Foundation for National Parks and Wildlife included Mitchell's Rainforest Snail as one of six feature species in its 2000 Threatened Species Appeal. A community awareness pamphlet highlighting the snail's plight and encouraging community cooperation in its conservation and recovery has been developed and distributed as part of the recovery plan. The NPWS Northern Directorate Threatened Species Unit has raised the public profile of Mitchell's Rainforest Snail in recent months through national, state and regional media including television, radio, newspaper and popular magazines. The NPWS recently cooperated with Tweed Shire Council in the preparation of updated interpretive facilities in Bruce Chick Park adjacent to Stotts Island. The interpretive facilities included prominent information on the significance of Stotts Island for Mitchell's Rainforest Snail.

It is also worth noting that the Tweed-Murwillumbah area supports both a significant recreational and tourism industry which may benefit from this critical habitat declaration. The declaration of Stotts Island as critical habitat will enhance the status of the Island and may lead to an increase in business for local river cruise operators on the lower Tweed River.

As a nature reserve specifically gazetted to protect the rainforest habitat the declaration of critical habitat over the island will continue the protection afforded to this significant area.

The proposal to identify critical habitat for Mitchell's Rainforest Snail in Stotts Island Nature Reserve was included as a priority 1 action in the publicly exhibited draft recovery plan (NPWS 2000b). The public submissions received indicated broad support for the recovery plan, with particularly strong support expressed for the proposal to identify critical habitat in Stotts Island Nature Reserve. The recommendation for critical habitat was publicly exhibited between 2 July to 20 August 2001, with all submissions received supporting the recommendation.

7.3 Ecologically sustainable development

The declaration of the habitat of this species as critical habitat is consistent with the principles of ecologically sustainable development. Ecologically sustainable development requires the effective integration of economic and environmental considerations in decision making processes, which can be achieved through the implementation of the precautionary principle, intergenerational equity, conservation of biological diversity and ecological integrity, and improved valuation and pricing of environmental resources.

The precautionary principle specifies that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental damage.

The principle of inter-generational equity specifies that the present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.

The identification and declaration of Stotts Island as critical habitat by the NPWS and Minister for the Environment indicates recognition of the significance of Stotts Island for the future survival and recovery of Mitchell's Rainforest Snail and recognition that higher levels of protection and environmental impact assessment are required to ensure the species and its habitat persists for the benefit of future generations.

8.0 Report preparation

This report was prepared by Michael Murphy NPWS Northern Directorate Threatened Species Unit with assistance from Nigel Greenup and Sonia Limeburner NPWS Tweed Area, Graeme McGregor NPWS Northern Directorate Operations Support and Coordination Unit, Lloyd Van der Wallen NPWS Head Office Biodiversity Management Unit and Steve Clarke and John Briggs NPWS Southern Directorate Threatened Species Unit. The line drawing used in Figure 1 and the cover illustration was provided by Ann Sheppard.

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US Federal *Endangered Species Act* Regulations.

10.0 Acronyms used in this document

D-G	Director-General of National Parks and Wildlife
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
IUCN	International Union for the Conservation of Nature
LEP	Local Environmental Plan
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NVC Act	*Native Vegetation Conservation Act 1997*
SIS	Species Impact Statement
TSC Act	*Threatened Species Conservation Act 1995*
US	United States
USA	United States of America

Figure 2 Recent records of Mitchell's Rainforest Snail.

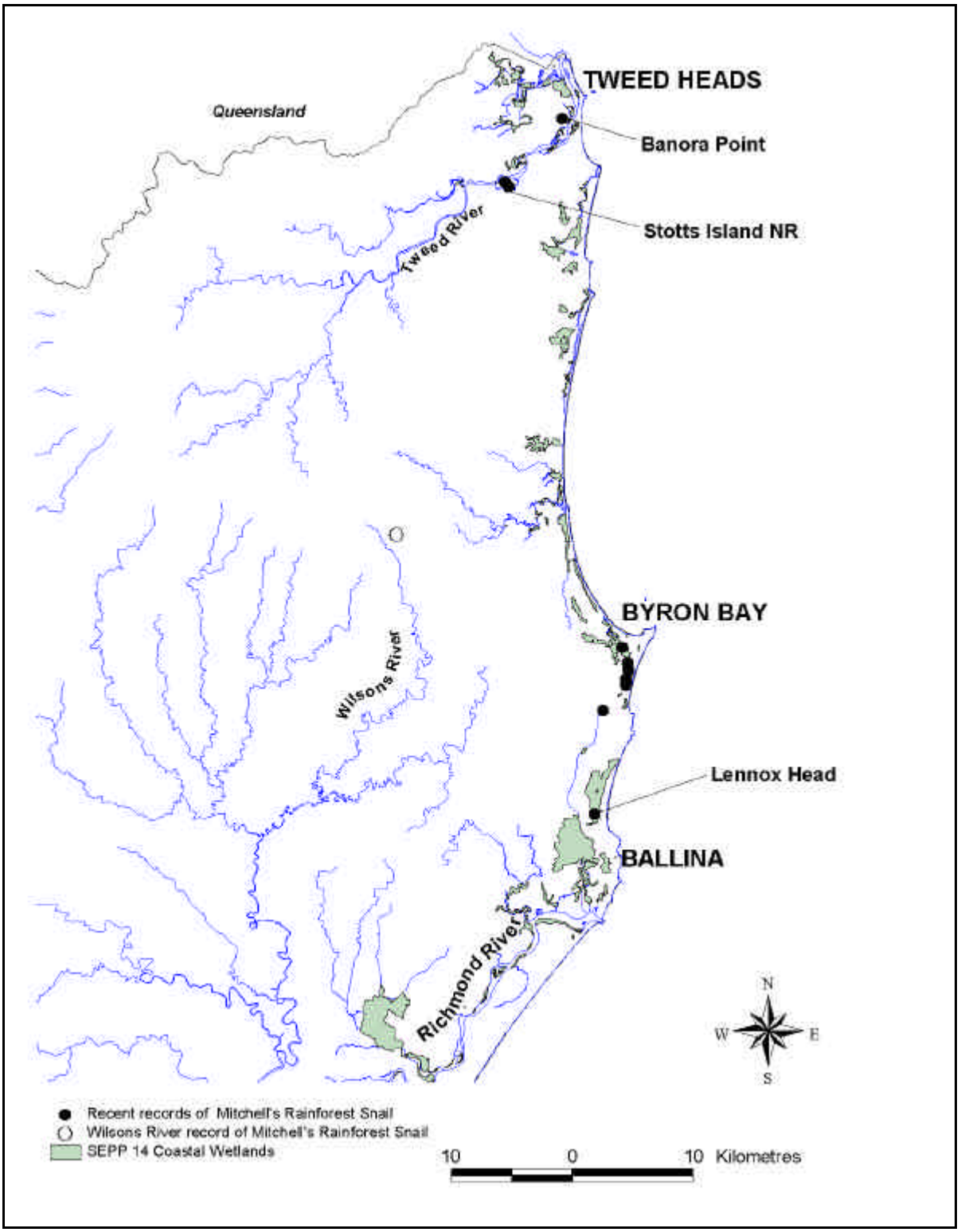

Figure 3 Location Map of Stotts Island Nature Reserve.

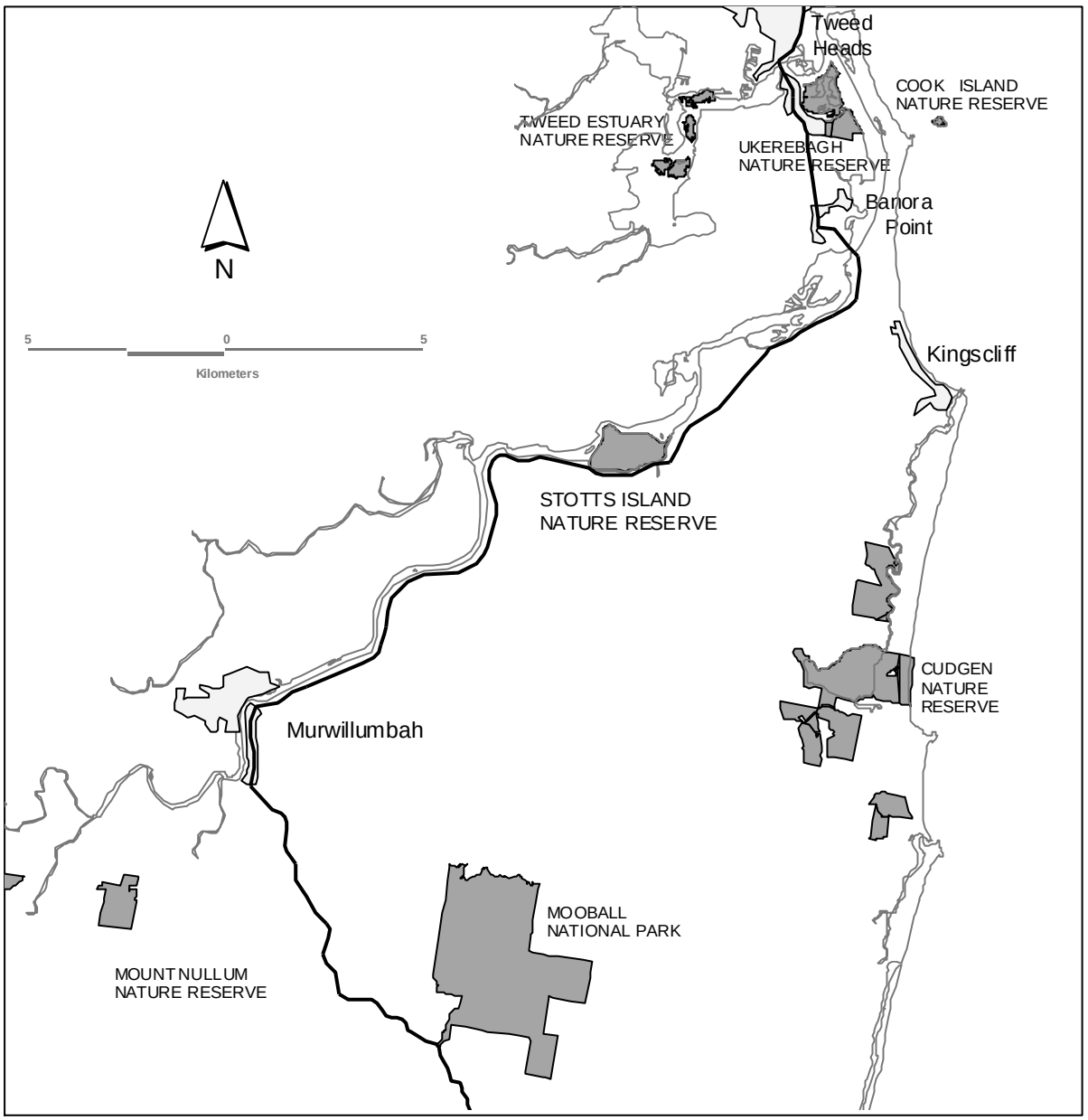

Figure 4 Map of Stotts Island.

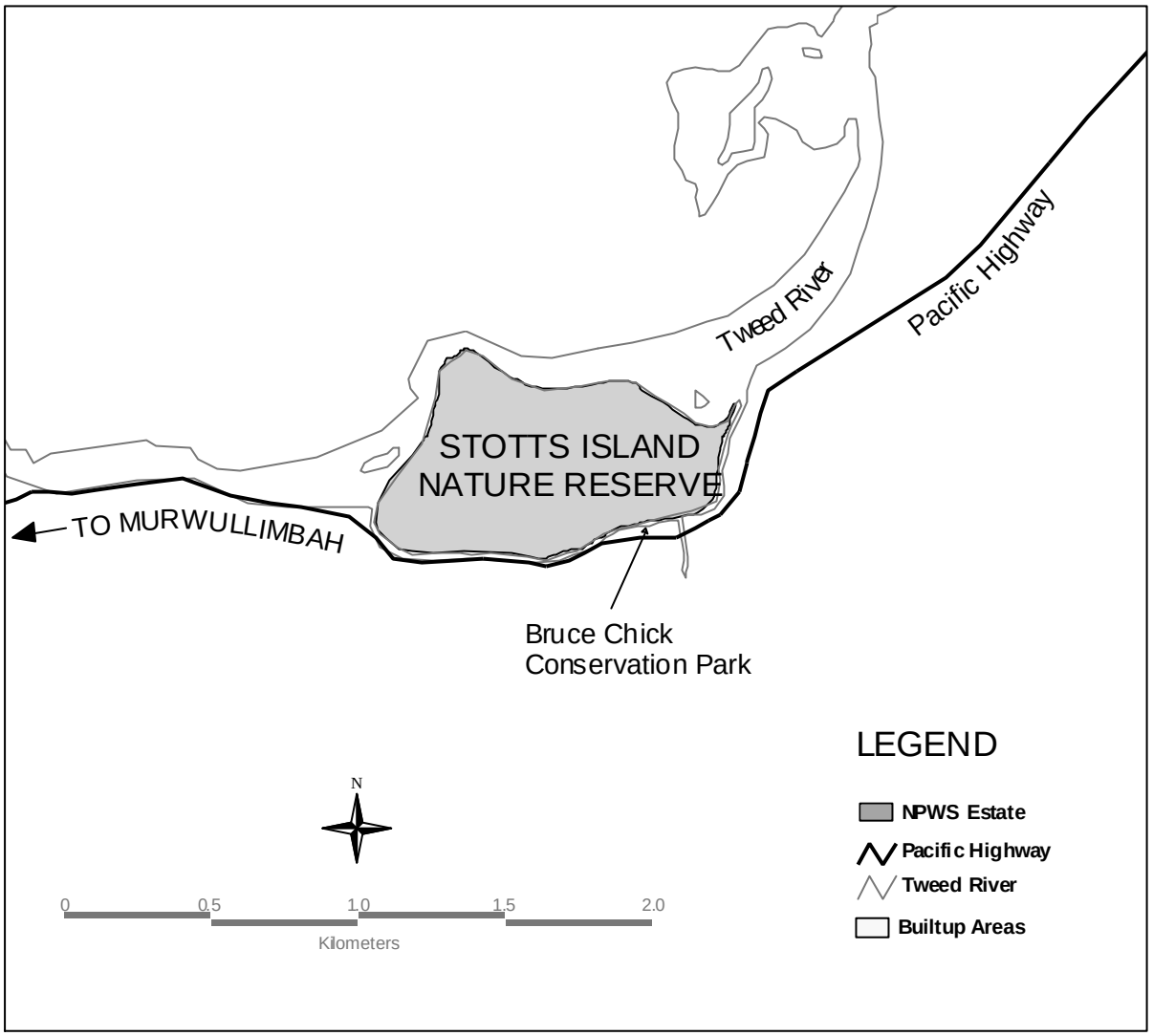

Figure 5 Stotts Island showing vegetation communities and records of Mitchell's Rainforest Snail.