

Torrington State Conservation Area

Plan of Management

NSW National Parks and Wildlife Service

January 2003

This plan of management was adopted by the Minister for the Environment on 13th January 2003.

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Cover photograph: Gulf Creek by Geoffrey James.

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NSW National Parks and Wildlife Service

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Foreword

Torrington State Conservation Area (SCA) is located on the western fall of the New England Tablelands in northern New South Wales, approximately sixty-five kilometres north west of Glen Innes. Gazetted in April 1996, Torrington SCA contains 30,030 hectares of open woodland and shrubby forest with occasional granite outcrops. It is a major vegetation remnant of the New England Tablelands and provides an important link between the northern forests of the Tablelands and the open woodlands of the North-western Slopes and Plains.

Torrington SCA is important for regional nature based recreation, while the tourism it attracts benefits local economies. Its popularity as a major fossicking destination in NSW, and the range of nature based recreation opportunities provided, contribute to the overall significance of Torrington SCA for recreation.

Recreational use of the SCA will be balanced against the need to protect the significant natural and cultural heritage values of the area. Best-practice management of existing uses and recreation activities will feature as a primary management goal to ensure that the values of Torrington SCA are not significantly compromised. Future visitors to the SCA will find a relatively undeveloped reserve that offers nature-based recreation opportunities that contribute to an appreciation and understanding of its natural and cultural values.

This plan of management establishes the scheme of operations for Torrington SCA. In accordance with the provisions of section 75A of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

Bob Debus

Minister for the Environment

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1.0 Introduction

1.1 The Management Plan

The *National Parks and Wildlife Act 1974 (NPW Act)* requires that a plan of management is prepared for each state conservation area. The plan is a legal document providing guidelines for sustainable use and protection of natural, cultural and recreational resources in the state conservation area and contains a written scheme of operations for managing such resources.

This plan of management outlines a strategic direction and management guidelines required to achieve the desired objectives for managing Torrington State Conservation Area (referred to as the SCA in this plan) during the operational period of the plan.

The plan is derived with consideration of Government legislation, National Parks and Wildlife Service (NPWS) procedures and policies, resource attributes and the current condition and the existing uses of the SCA.

Essentially, the plan of management will guide the NPWS and staff responsible for managing the SCA. It also informs the community about the management direction for the SCA and provides an opportunity for public comment of management proposals.

Once the plan of management has been adopted by the Minister for the Environment, no operations may be undertaken within the SCA unless they are consistent with the plan and the purposes and objectives of the *National Parks and Wildlife Act 1974*.

In future, amendments to the plan may become necessary due to:

- the availability of additional resource information;
- experience arising from planned and unplanned effects which may facilitate the need for changes in management programs;
- outcomes from research and monitoring programs that lead to better management practices; or
- new legislative or policy requirements.

The *National Parks and Wildlife Act 1974* requires that any amendments to the plan must follow the same process as for a draft plan and be placed on exhibition for public comment.

1.2 Management Obligations

Reserved under the *NPW Act*, the purpose of a SCA is to protect natural environments and cultural heritage values whilst providing ecologically sustainable nature based recreation activities. They are managed in accordance with the *NPW Act*, *National Parks and Wildlife (Land Management) Regulation 1995*, *Threatened Species Conservation Act 1996 (TSC Act)* and the *Environmental Planning and Assessment Act 1979 (EPA Act)*.

An amendment to the *NPW Act* in 2002 changed all former State Recreation Areas to State Conservation Areas. Appropriate recreational use remains an important component of use for SCAs while better acknowledging the importance of the area for its natural and cultural values. The Act clearly establishes the purpose for reservation and management principles for State Conservation Areas (section 30G of the Act) as being:

1. The **purpose of reserving land** as a state conservation area is to identify, protect and conserve areas:

- (a) that contain significant or representative ecosystems, landforms or natural phenomena or places of cultural significance, and
- (b) that are capable of providing opportunities for sustainable visitor use and enjoyment, the sustainable use of buildings and structures or research, and
- (c) that are capable of providing opportunities for uses permitted under other provisions of this Act in such areas, including uses permitted under section 47J, so as to enable those areas to be managed in accordance with subsection (2).

2. A state conservation area is to be **managed in accordance with the following principles:**

- (a) the conservation of biodiversity, the maintenance of ecosystem function, the protection of natural phenomena and the maintenance of natural landscapes,
- (b) the conservation of places, objects and features of cultural value,
- (c) provision for the undertaking of uses permitted under other provisions of this Act in such areas (including uses permitted under section 47J) having regard to the conservation of the natural and cultural values of the state conservation area,
- (d) provision for sustainable visitor use and enjoyment that is compatible with the conservation of the state conservation area's natural and cultural values and with uses permitted under other provisions of this Act in such areas,
- (e) provision for the sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to the conservation of the state conservation area's natural and cultural values and with uses permitted under other provisions of this Act in such areas,
- (f) provision for appropriate research and monitoring.

The NPW Act was amended to also provide for a **periodic review of the classification of SCAs** to determine whether they should receive either a national park or nature reserve classification. The classification review for state conservation areas is outlined below (section 47M of the Act):

- (1) The Minister is to review, every 5 years after the commencement of this section, the status of land within state conservation areas.
- (2) The review is to give reasons as to why each area of land within a state conservation area should or should not be reserved as a national park or natural reserve under section 47MA.
- (3) The results of the review are to be made available for public inspection free of charge, during ordinary office hours, at the head office of the Service and are to be published on the Internet by means of the website of the Service.
- (4) The review is to be undertaken in consultation with the Minister administering the *Mining Act 1992*.

Torrington SCA permits licensed rural activities, such as grazing and apiculture, which occurred prior to reservation of the SCA. These uses are recognised as existing interests at the time of reservation and are managed in accordance with Section 47H of the *NPW Act*. Licences are reviewed annually and conditions attached as required, so as to ensure that any adverse impacts on the natural and cultural heritage values of the SCA are minimised.

Torrington SCA also permits existing interests (as defined in section 47H of the *NPW Act*) such as mining and mineral exploration. Existing mining leases are managed in accordance

with regulations outlined in Section 47J of the *NPW Act* and the *Mining Act 1992*. Where not an existing interest, the written concurrence of the Minister for the Environment is required before a mining interest can be granted, or where there is a renewal of, or extension to, the term of a mining interest in a SCA (section 47J of the *NPW Act*).

As outlined in Section 72 of the *NPW Act*, this plan of management shall have regard to a number of objectives, including the following:

- (a) the conservation of wildlife (including the conservation of critical habitat and threatened species, populations and ecological communities, and their habitat);
- (b) the encouragement and regulation of the appropriate use, understanding and enjoyment by the public.

1.3 Location and Regional Setting

Torrington SCA is located on the north western fall of the New England Tableland within close proximity to the Queensland-New South Wales border. It adjoins Torrington village, and is approximately 65 kilometres north west of Glen Innes and 70 kilometres south-west of Tenterfield. The SCA adjoins and surrounds Torrington State Forest (refer to the map), which forms a major component of the granite batholith known as the Mole Tableland.

The SCA encompasses 30,030 hectares of land on the north-eastern side of the Beardy River, extending northwards to the plains leading into the Dumaresq River. The SCA is essentially a plateau that is surrounded by low range hills and landscapes modified for agriculture.

It is an important vegetation remnant of the New England Tableland and provides protection for rare or endangered plant species (refer to appendix 1) and fauna species of high conservation status (refer to appendix 2). At a bio-regional level there are no other continuous areas of vegetation, which remain uncleared (Clarke *et al.* 1998), that link the northern forests of the Northern Tablelands to the open woodlands of the North-western Slopes and Plains.

Torrington SCA contains outstanding heritage conservation values encompassing nature conservation, wilderness, scenic, recreation, Aboriginal and European historic values (NPWS 1991a & b). The Binghi Identified Wilderness constitutes approximately 80% of the SCA, however, it has not been gazetted despite fulfilling the assessment requirements under the *Wilderness Act 1987*.

1.4 Reservation of Torrington SCA

The move to provide protected area status to the SCA began in 1969 when the Severn Shire Council wrote to the NPWS suggesting that parts of Mole Tableland lent itself to the establishment of a national park (Stewart 1991).

Since that time there have been several attempts to have the natural and cultural heritage values of the Mole Tableland reserved as a protected area. For instance, in 1977 a recommendation for the Mole Tableland to be listed on the Register of the National Estate was rejected due to stakeholder opposition. In 1976 and 1988, similar proposals to have the Mole Tableland gazetted as the Beardy River National Park and the Binghi Wilderness Area were also opposed.

The Binghi Wilderness Assessment report (NPWS 1991) concluded that the natural and cultural heritage values of the area are of such significance that the greater land mass merits

a national park with declaration of a central wilderness core. However, the recommendation to gazette the Binghi Wilderness Area was not implemented because of the mining potential, rural uses and other economic considerations associated with the area.

With such diversity of land use requirements for the Mole Tableland, the Department of Lands commissioned a land assessment and capability study of the Mole Tableland. The study (Stewart 1991) recommended that the Torrington Regional Reserve be established as a multiple use area under the *Crown Lands Act, 1989*. The Regional Reserve was gazetted in 1992 and managed by a Trust made up of industry groups, government departments (including the NPWS), local community, conservation organisations and other stakeholders.

Under the NSW Government's new parks program, Torrington State Conservation Area was gazetted in April 1996. As a state conservation area the multiple use management philosophy is maintained, but within the context of recognising and managing for conservation, recreation and existing interests. While mineral prospecting and mining operations may be permitted under certain circumstances in the SCA, timber harvesting is prohibited.

Regional Forest Agreements

Regional Forest Agreements are one of the principle means of implementing the National Forest Policy Statement of 1992. Under this Statement the Commonwealth, State and Territory governments agreed to maintain native forest estate, manage it in an ecologically sustainable manner and develop sustainable forest-based industries. The Statement provided for joint comprehensive assessments of the natural, cultural, economic and social values of forests. These assessments formed the basis for negotiation of Regional Forest Agreements that provide, amongst other things, for Ecologically Sustainable Forest Management.

The process leading up to the RFA provided for major additions to the reserve system, including establishment of Torrington SCA. The SCA was established during the process leading up to the Regional Forest Agreement (RFA) for North East NSW. Under this agreement, all forest managers including NPWS must demonstrate ecologically sustainable forest management (ESFM).

2.0 Values of Torrington SCA

2.1 Natural Values

2.1.1 Geology and geomorphology

Torrington SCA is situated almost entirely upon a granite pluton of late Permian age known as the Mole granite batholith. The batholith covers approximately 800km² and forms part of the greater geological landmass, referred to as the Mole Tableland, that rises to 450m above the surrounding country. It is a northern, almost isolated, extension of the larger New England batholith that outcrops discontinuously from Tamworth to Stanthorpe (James *et al.* 1976).

A unique feature of the Mole granite is its strongly jointed structure that traverses the batholith in a number of directions (James *et al.* 1976). The existence of this highly jointed structure in association with the metallogenic nature of granite has produced significant mineralisation.

There are in excess of 150 mineral deposits situated within and around the Mole granite batholith including: tin, wolframite, silver, arsenic, bismuth, fluorite, beryl, molybdenite, emerald, sapphire, garnet, topaz, minor uranium and nickel-cobalt deposits (James *et al.* 1976). Consequently, the SCA's rich mineral deposits have been identified as an important mineral exploration and potential mining area for New South Wales.

The Mole Tableland is capped by a central sedimentary landmass referred to as the Torrington Sedimentary Pendant. The Pendant and surrounding poorly drained granites gradually rises above the Mole granite batholith, reaching 1150m on its eastern boundary. Composed of conglomerate, mudstones, siltstones and quartzite greisen; it also contains the worlds largest known substantial silexite (industrial topaz) deposits.

Permo-carboniferous sedimentary intrusions occur in the southern margin of the granite batholith and towards the western and northern boundaries of the Tableland. There are two formations of early Permian rocks, known as the Silver Spur and the Riverton Beds, both of which steeply fall away from the Tableland, forming a fringe around the granite batholith (James *et al.* 1976).

2.1.2 Landscape and catchment values

The rugged terrain of the granite batholith is dominated by a series of parallel, massive granite ridges with exposed rocky outcrops. The strongly jointed nature of this granite and its lithology are responsible for the development of unusually rough terrain that is rare in NSW (James *et al.* 1976).

The valley floors, low relief and rugged areas of the batholith contain high scenic and aesthetic values consisting of large monolithic outcrops and granite boulder fields. These areas provide panoramic views from many vantage-points in the SCA.

The terrain around the edge of the central sedimentary area and throughout the Catarrh Creek catchment (in the north eastern section of the SCA) is undulating to almost flat, while actual ground relief is rocky and uneven. Drainage from a small number of streams in the sedimentary areas has resulted in floristically rich sedge-heath and riparian vegetation types in these areas.

The flat terrain is confined to the Torrington Pendant. It has the highest land surface with mean maximum height of 1100m and is flat or gently undulating. In contrast to the other landforms,

drainage is extremely poor and it is characterised by swamp and grassy forest vegetation types that are not reserved in any other protected area.

The steeply dissected terrain corresponds with the sedimentary and meta-sedimentary rock outcrops on the boundaries of the SCA. Forming a broken belt around the edge of the granite batholith, this terrain is hilly with predominantly steep slopes forming v-shaped valleys. The rugged nature of this landscape and the forested ridges that are cut by deep rocky gorges and rapid flowing watercourses, provide outstanding scenic qualities.

The SCA provides protection for large parts of stream systems and sub-catchments that drain off the Mole Tableland into the Beardy and Mole Rivers, both of which are tributaries of the Dumaresq River. The rugged topography of the granite batholith contains watercourses that flow rapidly through steep gorges and valleys. The forested catchments of the SCA reduce the likelihood of flash flooding downstream and susceptibility to erosion.

2.1.3 Native vegetation

Situated in the transitional zone between the Northern Tablelands and North-western Slopes, the SCA is the only reserve providing protection for regionally significant vegetation associations and habitats in the gradation of those biogeographic zones.

The flora of the SCA is exceptionally rich with in excess of 750 vascular plant species having been recorded (Clarke *et al.* 1998). In a regional context, this compares with 709 vascular plant species recorded in Girraween and Bald Rock National Parks, 407 in Kwiambal National Park (Hunter 1998a) and 806 in the Washpool National Park additions (Hunter 1998b). Thus the presence of more than 750 vascular plant species indicates the SCAs importance in containing a large proportion of the plant species occurring on the north-western slopes and Northern Tablelands.

The presence of 45 nationally listed rare or threatened plant species (ROTAP) indicates the high conservation significance of the SCA (refer to appendix 1). This list also contains a number of species identified in the *TSC Act* that includes eight endangered species, five vulnerable species and one species thought to be extinct. Two of these ROTAP species, *Babingtonia odontocalyx* and *Prostanthera staurophylla*, are endemic to the Torrington area.

Six species new to science require taxonomic description and naming (refer to appendix 1) and are likely to be classified as ROTAP species (Clarke *et al.* 1998), including *Callistemon* sp. Aff. *flavovirens* which is listed as vulnerable in the *TSC Act*. Amongst these six new species, those in the genera *Homoranthus*, *Boronia*, *Eucalyptus* and *Plectantherus* appear to be restricted to the Torrington area. A full list of rare, vulnerable, endangered and significant plants is contained in appendix 1.

Twelve vegetation types (refer to appendix 3) have been identified on the Mole Tableland by Clarke *et al.* (1998), many of which are not well represented in the NSW protected area system. Two vegetation types, the mole granite outcrops and sedge-heath swamps, are only reserved in the SCA.

Species accumulation observations by Clarke *et al.* (1998) showed that species richness in all of the vegetation types in the Torrington area is remarkably high for a sub-humid climatic region. The most species-rich areas are found in the riparian woodlands and forest vegetation types. Containing rare or threatened plants, these vegetation types are poorly represented in the protected area system and make up less than two percent of the total SCA area.

In contrast to the riparian woodlands, the wet heaths and grassy forests associated with the poorly drained granites and metasediments (respectively) are less species-rich possibly due to the dominance of grass and tussock species. Both of these vegetation types are not well represented in the SCA or any other protected area, and mostly occur on private lands, in Torrington State Forest and in the Catarrh Creek catchment around the Torrington village.

The sharpest differentiation in species composition occurs between the rocky outcrops and surrounding woodland vegetation. These outcrops contain distinct shrub species that are restricted in these areas possibly due to the microhabitats on rocky outcrops that allow differential survival of species in response to moisture stress and frequency of fire. The outcrops are considered to be highly significant for the species they contain, including a large proportion of the ROTAPs recorded in the SCA.

2.1.4 Native animals

Torrington SCA has important zoogeographical significance because it contains a diversity of environments offering habitat for a variety of fauna. These habitats are relatively intact and provide an important faunal refuge amongst the extensively modified landscapes of the Northern Tablelands and North-western Slopes of northern NSW.

The SCA's importance as habitat refuge is attributed to transitional climatic patterns across the reserve, from the moist Northern Tablelands to the drier and hotter North-western Slopes (Smith and Smith 1991). This transition has allowed a range of fauna species to occur here, with the dominant species being associated with the humid temperate, humid tropical and sub-tropical regions of Australia. Less well-represented are those species associated with more arid areas and the eastern rainforest regions.

The SCA and the surrounding Mole Tableland has a diverse fauna, with large numbers of species recorded relative to the amount of survey work carried out. The Binghi (Mole Tableland) Fauna Survey recorded 21 mammals, 135 birds, 29 reptiles and 13 native frog species (Smith and Smith 1991).

An associated feature of the climate patterns in the SCA is that many species are at or near their distribution limits. Sixty-five, or one third, of the species recorded by Smith and Smith (1991) fall into this category. Species such as the yellow-tufted honeyeater, regent honeyeater, powerful owl, tiger quoll, rufous bettong, Northern brown bandicoot, large forest epitesicus and litter skink are at their western distributional limits, while the turquoise parrot, cockatiel, hooded robin, white-browed babbler, prickly gecko and tree dtella are at their eastern distributional limits. There are also several species that are at their latitudinal distributional limits. Each of the significant fauna species identified in the SCA (refer to appendix 2) have special habitat requirements and threats to their future existence in the area (refer appendix 4).

2.2 Cultural Heritage Values

2.2.1 Aboriginal heritage values

The territory of the Ngarrabul people extends north from Glen Innes well into the Mole Tableland area and according to the Ngarrabul people includes the entire SCA. Although Erskine and Moorhouse's (1999) research has not been able to confirm this, other Aboriginal groups that may claim interests are the Marbul in the north-eastern areas of the SCA and the Bigambul and the Jucumbul further west. Torrington SCA lies within the Moonbahlene Local

Aboriginal Land Council's area of responsibility, however Glen Innes Local Aboriginal Land Council also has strong interests in the area.

English (1998) suggests that Aboriginal occupation on the Mole Tableland was largely influenced by resource abundance, availability of shelters, ephemeral water sources, accessibility and climate. Ceremonial activities also appear to have been a basis for occupation and members of the Aboriginal community have indicated that sections of the Mole Tableland were associated with death and burial in the pre-contact period.

It is thought that the central and eastern sections of the Mole Tableland were primarily occupied during summer, when temperatures were warmer and a wide variety of edible plants were available. These areas, particularly around Carpet Snake and Back Creeks, had suitable water sources, level ground for camping, open vegetation and large populations of macropods. Given the seasonal variation in the availability of food and water and the cold winter climate on the Tableland, it is unlikely that the planning area was permanently occupied, although it was probably used as travelling routes allowing access to the Mole and Beardy Rivers.

The Aboriginal site survey of the SCA (English 1998) recorded open camp sites, isolated finds, rock art sites, shelters with deposit, shelters with potential deposit and a scarred tree. The open sites are located within the creek valleys and on some sections of the plateau. They are generally small areas that contain high quality quartz with some mudstone. Volcanic and siliceous artefacts are also present in some of these sites. The shelters are also found within creek valleys not far from water sources. Some of these shelter sites contain artefact material and are potential areas for further archaeological research. Many of the rock art sites share similar characteristics with others recorded on the Northern Tablelands, such as the use of red ochre and the representation of human forms and bird figures.

2.2.2 European and Chinese heritage values

Patterns of exploration and settlement across the Mole Tableland are associated with opening up the landscape initially for large-scale pastoral use by absentee landowners, followed by more permanent populations attracted by the mineral wealth. Burke (1998) identified numerous historical sites in the SCA which included stockyards, alluvial and lode mines worked by Europeans and Chinese miners, and associated settlement sites.

These sites are significant for the archaeological, historical, aesthetic and social values that they contain. Burke (1998) indicates that many of the sites within the SCA have national and state significance through their compliance with Australian and NSW heritage themes, particularly those associated with exploiting natural resources and remote settlements.

The mine sites are of State significance because they are amongst the earliest Australian tin fields. At least one site in the SCA was the first excavated lode tin deposit in NSW and contained the first tin crushing equipment in the Colony. During the nineteenth and early twentieth centuries, the Torrington area was situated within the largest tin producing mining division in NSW and supplied large quantities for international markets.

Many sites are considered to be archaeologically rare or regionally significant because they indicate unusual land use patterns, are not known to be protected in any other reserve or provide glimpses of previous human occupation. Many sites are historically significant but have been affected by deterioration and vandalism, including the water race used to divert

Blather Creek; Chinese domestic sites at the Gulf; Roaring Meggs stockyards; Turner's house and farm at Bismuth and items of mining infrastructure.

Many facets of the technology used at these sites demonstrate distinctive solutions to problems encountered in working and processing tin, and later wolfram, deposits (Burke 1998). The adaptation of traditional mining techniques to other kinds of deposits and situations demonstrates the twin processes of transferring technology between countries (Cornwall to Australia) and industries (gold and tin production techniques). The Flagstone and Cartwheel lodes, Back and Wall Creek lodes and Oppenheimer's all contain evidence of extraction and production techniques that were adapted from other techniques to suit specific local conditions.

The existing township of Torrington and the three former mining settlements of Bismuth, Tungsten and The Gulf are representative of the kinds of small-scale but largely self-sufficient communities typical of isolated mining towns. Their location demonstrates the practices of founding communities for goods and services in association with major mines.

2.3 Recreational Values

Torrington SCA is an integral component in a regional system of public and private lands offering a range of nature-based recreational opportunities. The SCA provides recreation opportunities in a variety of landscapes and settings towards the more remote end of the recreation opportunity spectrum where there is less emphasis on facility development. This recreation focus complements recreation opportunities provided in other nearby protected areas such as Kings Plains, Kwiambal, Boonoo Boonoo, Bald Rock, Girraween and Sundown National Parks as well as Pindari Dam and Copeton Waters State Park.

Accessibility and existing patterns of visitor use have resulted in more intensive recreation in the south-eastern section of the SCA. This part of the SCA is within an hour's travelling time, on mostly sealed roads, from Inverell, Glen Innes and Tenterfield making it a popular day trip destination for local communities. Its proximity to regional centres in northern New South Wales and south-eastern Queensland, easy access and accommodation available in the Torrington village and nearby towns increases its recreational values for the wider community.

Existing recreational facilities are centrally located around the south-eastern section of the SCA. The Blatherarm Camping Areas, Nomads Picnic Area and walking tracks to popular features such as Mystery Face and Thunderbolts Lookout are all accessible by vehicle and are within 5km of the Torrington village.

The Mole Tableland is nationally known for its semi-precious gemstones that are found in alluvial deposits along streamlines and in the tailings of abandoned mine sites. Fossicking is an attraction for visitors to the SCA with a large recreation catchment extending across much of eastern Australia. Fossicking activities are concentrated in Blather Creek and in the abandoned mine sites adjacent to the Duck Creek Trail, Dingo Gully and Fords Hill.

The northern perimeter of the SCA is only accessible for extended bushwalking trips due to the remoteness of these areas. These areas provide spectacular scenery of a landscape dominated by unusually shaped granite tors, rocky outcrops and deeply incised creeks with permanent water. Torrington SCA is the largest and least disturbed natural environment on the North-western Slopes and the western areas of the Northern Tablelands that is capable of providing self-reliant, remote recreation.

Nature-based tourism and recreation in the SCA is beneficial to the local and regional economy. Recreation and commercial tourism activities, such as fossicking and commercial horse riding tours, directly benefits the Torrington township through accommodation and other visitor services provided. Nearby towns and communities also benefit through expenditure on goods and services associated with recreation.

2.4 Scientific and Educational Values

The combination of the geology, climate, fire and vegetation clearing patterns on the Mole Tableland has produced a unique vegetation remnant that contains many flora and fauna species at their distributional limits. The occurrence of these species and those that are nationally listed as rare or threatened, including plant species new to science, raises many scientific questions prompting numerous opportunities for ecological research.

Torrington SCA contains an archaeological record which reflects many significant aspects of pre-contact Aboriginal use and occupation. These places have contemporary significance to Aboriginal people and can provide anthropological information to identify links with their ancestry. They also contain archaeological information that has the capacity to provide further information to the post-contact history of Aboriginal occupation on the Northern Tablelands region.

European and Chinese settlement of the Mole Tableland area lies in its association with the tin mining industry of the late nineteenth and early twentieth centuries. The sites contained within the SCA can provide information on living conditions, diet, acculturation and methods of working the deposits. The information gathered from such research can be used in interpretation displays to better educate future visitors to the SCA about the history of the Mole Tableland.

3.0 Management Direction

3.1 Management Vision

The primary management priority for the SCA is to protect its landscape, natural and cultural heritage values while providing ecologically sustainable nature-based recreational opportunities.

Torrington SCA forms part of an integral system of public and private lands, collectively providing a range of nature-based recreation opportunities for visitors. The SCA will provide visitor facilities and recreation opportunities with an emphasis on the development of low key visitor facilities.

The continuation of existing interests such as mining, mineral exploration, rural activities and fossicking is recognised and managed for. Management of the SCA will need to balance the demands of existing uses with the protection of the landscape and the natural, cultural and recreational values. Best environmental practice of existing uses will be required if they are to be ecologically sustainable.

3.2 Management Objectives

Management of Torrington SCA will be comply with the following specific objectives:

- (a) recognise and protect the SCA as a nationally significant vegetation remnant on the Northern Tablelands and North-western slopes of New South Wales;
- (b) recognise and protect the SCA as a nationally significant geoheritage site;
- (c) establish cooperative partnerships and working relationships with Torrington village residents, neighbours, visitors, tourism organisations, relevant government departments, rural users and mining interests;
- (d) encourage public awareness, appreciation and understanding of the natural values, with an emphasis on its flora and fauna species that are nationally significant, endangered, threatened or are at the limits of their geographic range;
- (e) in cooperation with local Aboriginal communities, protect and promote Aboriginal heritage values;
- (f) protect and promote European and Chinese heritage values in partnership with the local community;
- (g) protect and promote the outstanding geological, biological, and scenic features;
- (h) provide ecologically sustainable, low key nature-based recreation opportunities and facilities for visitors to enjoy and appreciate the SCA;
- (i) manage existing rural activities, fossicking, mineral exploration and mining interests to ensure best environmental practice and ecological sustainability; and,
- (j) encourage and facilitate scientific research and monitoring programs with an emphasis on incorporating their outcomes into management operations of the SCA.

4.0 Management Framework

This section provides a framework for managing Torrington State Conservation Area during the operation period of this plan. The objectives and actions established are based on management issues raised through the community consultation process, anticipated community trends over the next five to ten years, NPWS legislative responsibilities and anticipated resources available to the NPWS for managing the SCA.

The framework comprises a brief description which identifies the existing or potential processes or activities that may compromise or threaten resource values, their implications for management and proposed strategies to minimise such threats.

Where not specifically provided for in this plan, management will be in accordance with the *NPW Act* and NPWS policies. Management objectives and strategies relating to the conservation and protection of resources and use of the SCA are outlined in the following sub-sections.

4.1 Management for Resource Conservation

4.1.1 Geology, geomorphology and catchments

Geologically, the SCA is unusual because of its diversity of geological, geomorphological and mineralogical environments. It could be considered as one of the premier geodiversity sites in the NSW. Interpretation should therefore contain information on its geological values.

The granite batholith contains natural and cultural heritage values of high conservation significance, however, extensive open cut and underground mining activity has occurred as evidenced by the abandoned mine shafts, large quarries and vegetation clearing. Many of these landscape disturbances have not been restored or stabilised and are now popular areas for recreational fossickers. Soil erosion, poor water quality, site restoration and public safety are the principal management concerns in these areas.

The lower altitude and poorly drained areas of the granite batholith and the central sedimentary area contain significant Aboriginal sites and vegetation types. Past and present mining operations have adversely affected water quality, damaged Aboriginal sites and disturbed significant vegetation types. These areas are particularly susceptible to disturbance from mining, mineral exploration, grazing and inappropriate recreation.

The Catarrh Creek catchment, which includes the Torrington village, has been extensively developed and cleared to facilitate pasture production. It contains the most significant vegetation community found on the Mole Tableland, the sedge-heath complex, but vegetation type represents less than 1% of the SCA. Inappropriate recreation activities and unregulated fossicking in the north-eastern area of the SCA, around Blather Creek, can threaten this poorly represented vegetation community in the SCA.

The sediment and metasedimentary areas on the edges of the granite batholith contain significant plant species and vegetation types that are not well represented in the SCA. Disturbance to sensitive vegetation and habitat from mining, introduced pest species and grazing continue to be a management concern in these areas.

A water monitoring program is required to determine its quality given disturbance of the area by mining, grazing and fossicking. Until this occurs a cautious approach needs to be instituted whereby signs are installed at visitor use areas recommending the water is not suitable for drinking.

Management objectives

- ◇ Preserve and protect the natural landscape quality and integrity of the SCA.
- ◇ Ensure management activities are carried out in an ecologically sustainable manner that minimises soil erosion, siltation and water pollution.
- ◇ Ensure that activities within the SCA do not threaten the landscape values or conflict with the purpose of the SCA's reservation.

Management strategies

- ◆ Management activities and management trail maintenance works will be consistent with erosion mitigation, sediment control and clean water standards and guidelines developed by the Department of Land and Water Conservation (DLWC) and the Environmental Protection Authority (EPA).
- ◆ Areas of landscape disturbance will be identified and measures implemented to stabilise disturbance. Restoration and rehabilitation will be undertaken in areas where there are significant effects on landscape, hydrological, scenic, aesthetic or other values.
- ◆ The NPWS will liaise with other government agencies, local authorities, SCA neighbours and other relevant persons to encourage land management practices on the Mole Tableland that protect the landscape, scenic and aesthetic values of the SCA.
- ◆ In areas disturbed by previous mining and fossicking activities, and where not identified as significant cultural heritage sites, the NPWS will liaise with the DMR, DLWC, EPA and mining interests to develop rehabilitation programs and to seek assistance for their implementation.
- ◆ Interpretation displays will be developed to enhance public awareness of the geological and landscape values of the SCA.
- ◆ Pending further information on the quality of the water in the SCA, the NPWS will advise that the water in the creeks is not suitable for drinking.
- ◆ Water quality monitoring will be undertaken at strategic locations where required to assess the condition of the waterways in the SCA, especially where there is recreation, mining, mineral exploration, fossicking or sensitive environments.

4.1.2 Native vegetation

Seven major vegetation groups have been identified on the Mole Tableland (refer to appendix 3). Of these groups, five are further subdivided giving twelve vegetation types in total (Clarke *et al.*, 1998).

Forty-five rare or threatened plant (ROTAP) species, classified as nationally significant by Briggs and Leigh (1996), have been recorded in the SCA (appendix 1). While there is no legislative obligation associated with this classification or listing, the NPWS recognises that ROTAP species have high conservation significance that warrants specific management considerations to ensure their protection.

Of these ROTAP species, eight endangered species, five vulnerable species and one species thought to be extinct are also listed under the *TSC Act*. This listing legislates a requirement to employ management prescriptions to ensure that any processes that may threaten the survival of these species is controlled, reduced or removed.

Native vegetation management involves maintaining species, types and structural diversity, protecting significant plant species and types, and avoiding disruption to natural patterns and ecological processes. Management needs to be responsive to monitoring and research programs (refer to section 4.6) that provide feedback to better manage vegetation.

It is essential to minimise the potentially damaging effects of inappropriate fire regimes, introduced species and domestic stock grazing, mining and some recreation activities to allow natural ecological process to continue and to prevent species decline.

Large sections of the SCA, particularly in the eastern sections from the Duck Creek catchment through to the south-eastern boundary, show disturbance from mining and fossicking activities, land clearing, grazing of domestic stock and feral goats and too frequent fire regimes. The effects of these disturbances need to be assessed and reduced using specific management programs and techniques that can be adapted as required.

Management objectives

- ◇ Protect and preserve native vegetation types and natural ecological processes in the SCA.
- ◇ Protect plant species that are nationally listed as ROTAP, listed as endangered or vulnerable in the *TSC Act* or are of regional significance.
- ◇ Ensure appropriate protection and management to control, reduce or remove threats to vegetation types and species.
- ◇ Encourage research programs on ecosystem functions, plant and fire ecology and threatening processes in the SCA.

Management strategies

- ◆ An environmental assessment will be carried out for all future activities that are likely to have an impact on significant vegetation types and species in the SCA.
- ◆ A vegetation monitoring program will be established to provide information on the distribution and abundance of ROTAP and key indicator species.
- ◆ Vegetation monitoring programs will be established in popular fossicking areas along Blather Creek and the poorly drained areas of the granite batholith, to assess the impact of fossicking on ROTAP species and the aquatic environment.
- ◆ The NPWS will pursue opportunities to continue the fire ecology research program established in 1998 which provided information on fire responses and plant biology of the ROTAP and indicator species.
- ◆ Periodic and targeted vegetation surveys, conducted in all seasons, will be encouraged to monitor and update the species database.
- ◆ Interpretation displays and material will be developed to enhance public awareness of the ecological values of the SCA.

4.1.3 Native animals

Torrington SCA has a diverse fauna with high numbers of species having been recorded despite the limited survey work carried out to date. Over 200 species were recorded by Smith and Smith (1991) in the Mole Tableland area with an additional 74 species being recorded within a 25km radius, many of which are likely to occur in the SCA.

Management of species that are of special significance (refer appendix 2) requires an understanding of habitat requirements, species ecology and threats to populations. Appendix 4 identifies the habitat requirements and threats for those fauna species, based on available information. Other threats identified by Smith and Smith (1991) include inappropriate fire regimes, competition and predation by introduced animals, mining operations and gradual clearing of native vegetation (especially selective tree removal). Additional information is required on the distribution, ecological requirements and the impact of threats on significant fauna species to ensure that appropriate management strategies can be undertaken to protect these species.

Conservation of native fauna depends upon maintaining suitable habitats to support genetically viable populations. Many species require large home ranges and have specific habitat requirements that occur only on the fringes or even outside of the SCA. For instance Smith and Smith (1991) identified that the central sedimentary and riparian areas, which are largely outside the SCA, support the richest diversity of fauna. Fauna conservation and species management in the SCA can be enhanced through cooperative habitat management programs between adjacent public or private lands. Opportunities for cooperative management, perhaps through Voluntary Conservation Agreements, should be investigated.

Management objectives

- ◇ Protect and preserve the diversity of native fauna, their habitats and natural ecological processes in the SCA.
- ◇ Protect fauna species that are nationally listed as rare or threatened, listed as endangered or vulnerable in the *TSC Act*, at their distributional limits or are of regional significance.
- ◇ Improve current knowledge of fauna populations, ecological processes, threats and management requirements for native fauna in the SCA.
- ◇ Ensure appropriate protection and management to control, reduce or remove threats to native fauna, and where relevant cooperate with and assist neighbours to enhance the level of protection for significant species of native fauna.

Management strategies

- ◆ Collate available information on distribution, habitat requirements and potential threats for the threatened and significant fauna species in the SCA as well as any management recommendations. Where required, research programs will be encouraged (refer to section 4.6).
- ◆ A fauna survey with particular emphasis on significant species will be undertaken in the SCA to update information provided in the Smith and Smith (1991) report.
- ◆ Targeted fauna surveys will be encouraged for:
 - Fawn-footed Melomys *Melomys cervinipes* to determine habitat requirements in the SCA given that it is unusual for this species to occur here;

- Tiger Quoll *Dasyurus maculatus* to determine population levels, habitat requirements and whether the population has been affected by the 1080 wild dog baiting program; and
 - Eastern Long-eared Bat *Nyctophilus bifax* to determine habitat requirements with respect to preference for understorey or canopy vegetation.
- ◆ For threatened and significant species occurring within the SCA, appropriate management will be undertaken to reduce or eliminate threats to these species.
 - ◆ Interpretation displays and material will be developed to enhance public awareness of the native fauna species, their management requirements and other ecological values of the Mole Tableland and the SCA.

4.2 Management for cultural heritage conservation

4.2.1 Aboriginal heritage

The Archaeological Survey of Aboriginal Sites undertaken in Torrington State Conservation Area (English 1998) provides an insight into Aboriginal people's land use practices and occupation patterns which would have occurred on lands now within the SCA. English (1998) also identified management guidelines for conserving Aboriginal cultural landscape values recorded in the region.

The survey identified open campsites, isolated artefacts, rock art sites, shelters with deposit, shelters with potential deposit and a scarred tree. However, English (1998) points out that many of these sites have been disturbed and damaged by natural processes as well as land clearing, construction of fire trails, introduced animals, fossicking and mining. These factors continue to threaten the integrity of many areas that contain Aboriginal sites in the SCA.

The NPWS recognises the importance of establishing cooperative management with the local Aboriginal community to protect and manage Aboriginal cultural values in the SCA.

Cooperative management between the NPWS and the Aboriginal community will involve sharing knowledge as well as jointly planning and implementing heritage management programs. This approach to management will help ensure that the cultural values of the landscape will be respected and better understood by the wider community.

Management objectives

- ◇ Protect and preserve Aboriginal cultural landscape values in the SCA.
- ◇ Minimise potential threats and disturbances to Aboriginal heritage values.
- ◇ Recognise and respect contemporary Aboriginal cultural landscape values associated with the SCA.
- ◇ Establish cooperative management of Aboriginal heritage values with the local and regional Aboriginal community.
- ◇ Promote awareness, understanding and appreciation of Aboriginal heritage values and Aboriginal culture to visitors of the SCA.
- ◇ Encourage further survey work throughout the SCA, including conducting archaeological, historical and anthropological investigation.

Management strategies

- ◆ Aboriginal cultural values in the SCA will be protected and managed in accordance with NPWS policies and in consultation with the Moonbahlene and Glen Innes Local Aboriginal Land Councils.
- ◆ As far as practicable, Aboriginal sites will be protected from disturbance or damage. Priority will be given to essential protection works for rock art sites, open campsites and archaeological deposits in particularly vulnerable areas.
- ◆ Any site management or monitoring programs will be undertaken in cooperation with the relevant Local Aboriginal Land Council.
- ◆ Proposed new development programs will be preceded by an assessment of the archaeological and historical values, in cooperation with the Moonbahlene and Glen Innes Local Aboriginal Land Councils.
- ◆ The NPWS will investigate the feasibility of providing on-site interpretation for selected sites in the SCA. Interpretation of Aboriginal heritage values will be designed and promoted in conjunction with the Aboriginal community to ensure that information is culturally correct and appropriate.
- ◆ Further survey work will be encouraged throughout the SCA and consideration will be given to conducting further archaeological and historical investigation. All future research and survey work will be developed, designed and implemented in cooperation with the Moombahlene and Glen Innes Local Aboriginal Land Councils.

4.2.2 European and Chinese heritage

Determination of significance provides a basis from which to assess the range of conservation management programs appropriate to protect cultural heritage places and sites. It also allows an assessment of priority to be undertaken based on degree of rarity, that is whether the place or site is unusual or endangered, and representativeness, which involves an assessment of its current condition. Burke's (1998) assessment of significance of sites and places in the SCA has provided a basis from which to identify conservation issues and develop priorities for management programs aimed at preserving the cultural heritage values.

The Historical Archaeological Assessment of European Cultural Heritage Sites (Burke 1998) has identified that heritage sites in the SCA, and the surrounding area, are of significance both individually and as a collection.

The European and Chinese heritage sites are in various stages of deterioration and many require active management programs to ensure that the fabric and significance of these places and sites is maintained and preserved. Management and monitoring programs (refer to section 4.6) will be directed towards reducing threats from vandalism, theft, fire, introduced species, and natural deterioration of the fabric and structures.

Burke (1998) recommended that all sites and places in the SCA should be retained in their current state with periodic monitoring of their condition to ensure there is no loss of fabric or values from the threats identified above. Where there are perceived threats to these values, maintenance and stabilisation work will be carried out. However, the introduction of new material to sites should only occur where public safety is a concern. For any site management that involves maintenance or stabilisation, the provisions of the Australian ICOMOS Burra Charter will be observed.

Torrington SCA contains heritage values of significance to the local and regional community. It is important to increase public understanding and appreciation of the historical and contemporary cultural heritage values. Through cooperative management with the community and promoting cultural heritage values to visitors, a greater respect for these values will assist in their conservation and preservation.

Management objectives

- ◇ Protect European and Chinese heritage values in the SCA.
- ◇ Minimise potential threats and disturbances to European and Chinese heritage sites.
- ◇ Establish cooperative management of European and Chinese cultural heritage values with the community.
- ◇ Promote awareness, understanding and appreciation of European and Chinese cultural sites and heritage values.
- ◇ Encourage further archaeological, historical and anthropological survey work, using a variety of survey techniques, in the SCA.

Management strategies

- ◆ The provisions of the Australian ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter) will guide the management of European and Chinese heritage places in Torrington SCA.
- ◆ The NPWS will provide interpretative information for visitors to the area to gain an understanding and appreciation of the European and Chinese heritage values.
- ◆ The NPWS will provide on-site interpretation for selected sites in the SCA. Priority will be given to those sites that are in close proximity to public access areas.
- ◆ Appropriate fire management operations will be carried out to reduce the risk of bushfire damage to cultural sites and places (refer to section 4.3.1).
- ◆ Proposed new developments will be preceded by an assessment of the archaeological, historical and anthropological values.
- ◆ The management recommendations for site protection made by Burke (1998) will be evaluated and an implementation program developed. Priority will be given to site management programs (including those for mine sites) requiring conservation plans, minimising threats or where public safety is a concern.
- ◆ The NPWS will liaise with the Torrington community with regard to the management of European and Chinese cultural heritage places and sites.
- ◆ Further archaeological and historical investigation will be encouraged in the SCA.

4.3 Management for Reserve Protection

4.3.1 Fire management

The NPWS recognises that fire is an important natural phenomenon in the SCA and is essential for maintaining species and habitat diversity. The frequency of fire and the season in which it occurs are some of the major factors influencing the abundance, distribution, composition and survival of many plant and animal communities.

Fire management, however, is complex and not fully understood, and inappropriate fire regimes and practices may cause localised extinction or population reduction of many plant and animal species. Fire can also have detrimental effects on cultural heritage and recreational values as well as threaten visitor safety and neighbouring properties.

A fire management plan will be prepared for the SCA, but until this is completed, fire management within the SCA will operate under the principles identified in the *Rural Fires Act* and NPWS policies. Priority for fire management will be given to the protection of life and property, suppression of wildfire, conservation of both plant and animal communities that require specific fire regimes, and the maintenance of species and habitat diversity.

(i) Fire management obligations

Under *the Rural Fires Act, 1997* the NPWS is a recognised fire authority and is responsible for the control and suppression of all fires on its estate. This responsibility extends to the implementation of fuel management programs designed to protect life and property, as well as the natural and cultural heritage of its reserves. The NPWS may, under its Act, suppress or assist in the control of fires within eight kilometres of any land which it manages.

(ii) Fire history

Fire history records for the Mole Tableland are scarce, however, it is known that major wildfires occurred in the SCA in 1965, 1975, 1985, 1990 and 2002 (TRRT 1995b). This provides a preliminary indication that large wildfires appear to occur every 10 years due to lightning strikes, arson and hazard reduction burns escaping from adjacent areas. However it is likely that the overall fire frequency is much higher due to the occurrence of many small fires that are undetected, do not require suppression activities or are prescribed burns within grazing license areas (TRRT 1995b).

(iii) Life and property protection

The Torrington village is recognised as an area that requires enhanced protection from wildfire as it is in the path of hot westerly winds associated with high fire danger (TRRT, 1995b). An integrated system of fire trails has been constructed. These will be used to establish two fuel reduction zones around the village perimeter. It is proposed that prescribed burning in these zones will be undertaken, subject to risk, hazard and environmental assessment, and in conjunction with fuel reduction strategies on neighbouring properties.

(iv) Fire management planning for ecological requirements

In order to meet ecological responsibilities, fire regimes need to be established that will integrate natural and cultural heritage conservation with life and property protection. Contemporary ecological research in fire prone areas has established broad principles about fire regimes that are required to avoid the extinction of species and thus conserve biological diversity.

Management objectives

- ◇ Reduce the bushfire threat in order to protect life and property within, and immediately adjacent to, the SCA.
- ◇ Effectively manage bushfires to maintain species and habitat diversity and to conserve natural, cultural and recreational values in the SCA.

- ◇ Develop an integrated approach to fire management and establish cooperative fire management practices and operations on the Mole Tableland with both the Rural Fire Service and neighbours.
- ◇ Enhance existing knowledge of the fire ecology of plant and animal species occurring in the SCA.

Management strategies

- ◆ A fire management plan for the SCA will be prepared by 2004.
- ◆ The NPWS will pursue opportunities to continue the fire ecology research program established in 1998, to provide critical information on fire responses and the biology of ROTAP and indicator species.
- ◆ Subject to the bushfire hazard and an environmental assessment, prescribed burning programs will be undertaken where necessary to protect life and property.
- ◆ Research programs on the fire ecology of significant plant and animal species, or vegetation communities occurring in the SCA, will be encouraged.
- ◆ Bushfire risk mapping will be undertaken to identify areas of potential high fire risk.
- ◆ Environmental assessment is unlikely to be required for emergency fire suppression activities, however such activities will be planned in order to minimise impacts on sensitive ecological, cultural and recreational areas.
- ◆ Fire management activities will be managed in accordance with the SCA fire management plan and Northern Tablelands Region Incident Response procedures.
- ◆ The use of heavy machinery for fire suppression will, where possible, avoid sensitive areas such as significant plant populations, vegetation types that are under represented in the SCA and known areas of Aboriginal, European and Chinese heritage values.
- ◆ All new tracks and/or other areas disturbed by fire suppression activities will be rehabilitated as soon as possible after the fire event. Preparation of site rehabilitation plans will be encouraged as part of the fire incident action plan.
- ◆ Prescribed burning programs will be undertaken on a priority basis to protect life and property subject to bushfire hazard, risk and environmental assessment. Where possible, control of introduced animal populations and weed species will precede and follow prescribed burning programs.
- ◆ Fire management will aim to establish non-uniform fire frequencies across the SCA, based on the management recommendations by Clarke and Fulloon (1999).
- ◆ Monitoring programs will be developed to assess the response of rare plant populations after fire, based on the management recommendations by Clarke and Fulloon (1999). Results from these programs will be used to assist in conserving rare plant populations.
- ◆ Prescribed burning, trail maintenance and other fuel management programs will be reviewed before each fire season in accordance with this plan of management and the proposed reserve fire management plan.
- ◆ Management trails and any other access routes will be assessed for their strategic value for fire management. Trails that are considered to be non-essential for fire suppression, and are not required for recreational purposes or access to apiculture or mining interest areas, will be closed and rehabilitated.

- ◆ Obtain and map records of fire history and bushfire risk to determine priority areas for prescribed burning programs, protect life and property and maintain ecological diversity.
- ◆ The NPWS will liaise with the Rural Fire Service, relevant stakeholders and neighbours to establish an integrated approach to fire management to protect life and property and to maintain ecological diversity.

4.3.2 Introduced species

A Draft Pest Species Management Plan (PSMP) has been prepared. The PSMP provides operational direction and identifies best-practice management techniques that are based on current scientific information. It contains information on the range of pest species, likely impacts and the methods of management for introduced plants and animals species. It was prepared using current knowledge of best practice control strategies in terms of effectiveness and approved animal ethics. Principles of adaptive management will be employed, and should new information or techniques arise amendments will be carried out. Revisions of the PSMP will include input from the Rural Lands Pasture Protection Board and the Torrington Wild Dog Association.

The NPWS has established cooperative pest management control programs around the SCA, and will continue to manage pest species in liaison with the Torrington Wild Dog Association, Rural Lands Pasture Protection Board and rural landholders

(i) Introduced plants

Introduced plants in the SCA are the result of disturbance to natural ecosystems from past agricultural practices, disturbance from mining activities and land clearing. Most of the species known to occur in the SCA are concentrated in these areas as well as the peripheral areas around Torrington village, adjacent lands and along the most frequently used public access fire trails.

Information on the distribution and abundance of introduced plant species in the SCA is limited. Clarke *et al.* (1998) recorded 34 weed species in the SCA, although these numbers are expected to be much higher. While many of these species may not be particularly invasive they have the potential to threaten the integrity of native vegetation and the survival of some species.

Of the species known to occur, blackberry (*Rubus fruticosus*), prickly pear species (*Opuntia* spp), sweet briar (*Rosa rubiginosa* spp.agg) and Noogoora burr (*Xanthium occidentale*) are listed in the NSW *Noxious Weeds Act 1993*. This places an obligation upon the NPWS to control these species to the extent necessary to prevent such weeds spreading to adjoining lands. These infestations will be controlled to prevent the likelihood of further invasions, although complete eradication is rarely possible.

(ii) Introduced animals

In addition to providing a refuge for native animals a variety of introduced species are also found in the SCA. Introduced animals known to occur throughout the SCA include wild dogs, foxes, feral pigs, horses, goats, cats and rabbits. These species present a significant threat to native plants and animals through predation and competition for habitat.

The Tenterfield Rural Lands Protection Board (RLPB) in conjunction with the Torrington Wild Dog Control Association has performed annual aerial baiting programs to control wild dogs in the SCA for over twenty years up until 1996. In accordance with the NPWS policy, aerial baiting ceased in 1996 because its impact on susceptible native species, such as the

Spotted Tail Tiger Quoll, is uncertain. A cooperative approach with landholders is required in order to minimise impacts on the rural community, however, the role and function of wild dogs in the ecosystem should also be properly and fully considered.

Since the cessation of aerial baiting in the SCA, the NPWS has conducted biannual fox and wild dog programs using mound baiting techniques. These programs are conducted in conjunction with baiting programs conducted by the Rural Lands Protection Board on adjoining private property. Mound baiting programs are target specific and provide data on visitation patterns of target species and susceptible native fauna. This data can then be compared from year to year to provide indications of relative rises or declines in the visitation patterns of target and non-target species.

Feral goat populations inhabit rocky outcrop areas throughout the SCA. Clarke *et al.* (1998) reported that a majority of the ROTAP species recorded in the SCA are located in areas where goats significantly impact upon these plant species. English (1998) also reported that goats have been observed sheltering in Aboriginal rock art sites and may potentially damage delicate artwork.

The NPWS has performed strategic helicopter shooting programs that have had varying success. Consequently, a program which involves radio tracking feral goats has been established within the SCA. This program involves regular helicopter shooting programs, and when feral goat densities are reduced to very low levels, these aerial shooting operations will be more cost-effective and efficient due to reduced aerial search time. This program will continue.

Wild horses are present in the SCA and they can have significant impacts on ROTAP species and Aboriginal sites, and as such are considered a pest species. To improve the management of this species, radio collared horses will be released to assist in the location of feral horse herds in the SCA. Horse numbers will be monitored and, if they reach population levels where they are having a measurable impact on the natural or cultural values of the SCA, the NPWS will implement a control strategy in consultation with the local community.

There is very limited information on the vertebrate pest populations throughout the SCA. There is a large rabbit population around Nomads picnic area, and pigs are present in most of the open riparian vegetation types throughout the SCA. Best practice management for these species will be considered in the pest management strategy currently being prepared for the SCA.

The NPWS will investigate opportunities for contracting pest species management programs.

Management objectives

- ◇ Minimise damage caused to natural vegetation, fauna communities and water quality in the SCA from introduced pest species.
- ◇ Minimise distribution and density of introduced pest species in the SCA.
- ◇ Priority for control of introduced species will be given to species which are aggressive competitors or predators known to impact on native species, damage cultural heritage sites, affect neighbouring lands, have a high capacity for dispersal, or are new isolated occurrences.

Management strategies

- ◆ A pest species management plan has been prepared. Should new information or techniques arise, amendments to the pest species management plan will be undertaken.

- ◆ Introduced pest species management programs will be developed to minimise effects on non-target species. Preference will be given to management techniques which have minimum environmental impact.
- ◆ Weed control programs will be undertaken in disturbed areas such as mine sites, management trails and popular recreation areas.
- ◆ The known occurrence, distribution and density of introduced pest species will be periodically mapped as part of the monitoring strategy.
- ◆ Priority programs for controlling introduced animals that will be addressed in the proposed Pest Species Management Plan will include:
 - Continuation of the fox and wild dog monitoring and mound baiting programs in accordance with the NPWS wild dog policy.
 - Continuation of the radio-collared goat program in conjunction with helicopter shooting. Neighbours will be notified of shooting programs and precautions will be taken to ensure that firearms are not discharged in the vicinity of cultural sites and adjoining lands.
 - Radio collared horses may be used to assist in the detection and management of the feral horse population in the SCA. If horse numbers reach population levels where they are having a measurable impact on the natural or cultural values of the SCA, the NPWS will implement a control strategy in consultation with the local community.
 - Rabbit and pig control programs.
- ◆ Liaise with the RLPB, Torrington Wild Dog Control Association and neighbouring landowners concerning the cooperative management of pest species in and around the SCA.

4.4 Management for visitor use

4.4.1 Recreation opportunities

The SCA is well known as a location for fossicking, but it is becoming increasingly popular for other recreation activities. Many recreational uses impact on protected areas and need to be managed within sustainable limits to ensure there is no significant loss of natural or cultural values.

Due to the topography and access, visitor facilities such as walking tracks, picnic areas and camping grounds are concentrated in the south-east. The more remote areas of the SCA are undeveloped and provide for those visitors seeking more remote experiences away from other users. These areas tend to be used for bushwalking, horse riding and four wheel driving.

The primary management objective for providing recreation opportunities in the SCA is to ensure they are compatible with its conservation values and complement opportunities provided on other public lands and on private land within the Region.

While a SCA aims to provide for a diverse range of recreational activities it is important that these activities do not threaten the natural and cultural values of the SCA and are compatible with other recreational users. Table 1 outlines the recreation activities that are permitted in the SCA and any conditions that apply:

Table 1: Permissible recreation activities, their location and conditions of use

Permitted recreational activities	Location/s where activity is permissible	Conditions applying
Picnicking	Facilities provided at: - • Nomads Picnic Area; • Mystery Face; and • Blatherarm	Picnicking permitted elsewhere provided no fires are lit.
Car-based camping	Facilities provided at Blatherarm (3 areas).	No.
Remote area camping	Throughout the SCA.	Not within 200m of an existing visitor facility or roads open to the public. No fires permitted.
Scenic driving- 2WD vehicle	Major unsealed track (see map).	No.
Scenic driving – 4WD vehicle	Major unsealed tracks. Minor unsealed tracks (see map).	Permissible on minor unsealed roads in dry weather only.
Nature study, photography and/or cultural awareness	Throughout the SCA.	No.
Horse riding	Major unsealed tracks. Minor unsealed tracks (see map).	Must be on designated roads and trails – not permitted away from roads and trails or on walking tracks.
Cycling	Major unsealed tracks. Minor unsealed tracks (see map).	Must be on designated roads and trails – not permitted away from roads and trails or on walking tracks.
Bushwalking on designated tracks.	Walking tracks provided to Thunderbolts Lookout and Mystery Face.	No.
Remote area bushwalking	Throughout the SCA.	No.
Fossicking	Throughout the SCA.	Must be carried out within minimal impact guidelines described in section 4.4.6.
Adventure activities	Permissibility subject to Regional Manager's approval.	Must have consent under the <i>NPW Act</i> , and additional conditions will apply.
Group activities (including military)	Permissibility subject to Regional Manager's approval.	Must have consent under the <i>NPW Act</i> , and additional conditions will apply.
Commercial recreation	Permissibility subject to Regional Manager's approval.	Must have licence under the <i>NPW Act</i> and additional conditions will apply.

Management objectives

- ◇ Provide an appropriate range of ecologically sustainable, nature-based recreation opportunities to cater for a variety of visitor preferences.
- ◇ Minimise conflict between different types of recreation opportunities offered in the SCA.
- ◇ Manage recreation activities so that they do not compromise the landscape, natural and cultural values of the SCA.
- ◇ Promote the SCA as part of a regional system of public and private lands providing recreational opportunities.

Management strategies

- ◆ Undertake visitor surveys in the SCA to determine visitor profiles, use patterns, visitor numbers and/or recreation preferences.
- ◆ Promote minimum impact recreation practices through brochures and other interpretative material.

- ◆ Monitor visitor use for unacceptable environmental impacts. Where there are unacceptable impacts the NPWS may temporarily close these areas to carry out necessary repair and/or rehabilitation programs.
- ◆ Promote the SCA as part of a regional system of public and private lands offering nature based recreation activities.

4.4.2 Visitor facilities and activities

(i) Camping and picnic areas

Visitor facilities are provided in the peripheral areas of the SCA at Blather Creek, Thunderbolts lookout, Nomads picnic area and Mystery Face. Site development for these areas has already been carried out and it is proposed that the current level and type of facility development will be retained.

Camping at Blather Creek has been formalised to reduce environmental impacts. There are three small camping areas at Blatherarm: two accessible to two-wheel drive vehicles and one that is accessible only to four-wheel drive vehicles. Designated sites, picnic tables, sealed pit toilets, fire places, barbecues and an interpretation display are provided.

Nomads picnic area has picnic tables, barbecues, toilets, a cooking galley, an interpretation display and formalised car park. The garbage pit is below the watertable and will need to be removed. In keeping with a minimum impact recreation philosophy, visitors will be required to take their rubbish with them.

Walk in camping will be permitted in the SCA, provided it is not within 200m of roads available to public vehicles, walking tracks or visitor facilities, although its popularity as a recreational activity is unknown. Visitors will be encouraged to adopt minimal impact camping practices.

Camping and caravan sites are also provided in Torrington and Emmaville.

(ii) Roads and trails

Access in the SCA is required for recreation, fire management, search and rescue, pest species management, servicing facilities and to provide access to apiculture sites and private property. The SCA has an access network that consists of two-wheel drive roads, four-wheel drive roads, fire trails, old mining and apiary access trails and walking tracks.

Butler and Blatherarm Roads provide all weather, two-wheel drive access. These unsealed roads service the key recreation areas in the SCA. Four wheel drive access is provided by Butler Mine Road and Carpet Snake Creek Trail. The Butler Mine Road provides access to Butler Mine and the Carpet Snake Creek Trail provides through access to the Gulf Road. Carpet Snake Creek Fire Trail currently has two gates that will be locked in wet weather. These gates are signposted and the NPWS will put an additional sign in Torrington so that the community and visitors know when the trail is closed.

Thunderbolts Management Trail has a gate near its intersection with Silent Grove Road that can be locked in wet weather or as required (see the map). This trail will be available to walkers, cyclists, horse riders and authorised vehicles. Public vehicles will not be permitted. A sign will be erected at the gate to this effect. In the event of continuing use of the trail by public vehicles, the NPWS will reassess permitted access to determine an appropriate strategy, which may include locking the gate, in consultation with the community.

The existing Blather Falls Trail will become the Ugly Corner walking track. As agreed to by the representatives of the community, the chain will be removed and replaced with a barrier such as bollards. This trail will be open to walkers but closed to vehicle access.

The Duck Creek Fire Trail has no through access, does not service any designated recreational area, contains sensitive Aboriginal sites within its margins, is highly erodible and costly to maintain. The trail will be closed to public vehicular access, but will be retained as a fire trail with access being permitted to apiarists.

Public vehicular access will not be permitted on the closed fire or management trails. These trails provide access for fire protection and other management purposes. Frequent use of these trails would cause surface deterioration and compromise their use for emergency situations.

Blatherarm Road is a public road that passes through the SCA, providing access to recreation facilities, apiary sites in the SCA and private property. The NPWS, in consultation with Tenterfield Council, has carried out essential maintenance works to improve the standard of access for SCA users.

Eight locked gates are currently in place on the boundaries where access trails lead in and out of the SCA onto private property. These gates are the responsibility of the private landholders and may be locked at their discretion.

Table 2 identifies the permissible access for the roads and management trails in the SCA.

Table 2: Permissible recreational access

Name of track / trail	2WD vehicle Access	4WD vehicle access	Bus/coach access	Bicycle access	Horse riding	Walking	Comment
Blatherarm Road	Y	Y	Y	Y	Y	Y	Public road, not within the SCA.
Butler Road (to Mystery Face)	Y	Y	Y	Y	Y	Y	Public road, not within the SCA.
Butler Mine Road	N	Y	N	Y	Y	Y	Provides access to Butler Mine Fire Trail and to private property.
Carpet Snake Trail	N	Y	N	Y	Y	Y	Provides through access to Gulf Road. Closed during wet weather except to walkers.
Torrington Town Trail	N	Y	N	Y	Y	Y	Provides through access around the town.
Duck Creek Fire Trail	N	N	N	Y	Y	Y	Provides access to private property. Closed during wet weather except to walkers.
Butler Mine Fire Trail	N	N	N	Y	Y	Y	Provides through access but via private property.
Thunderbolts Fire Trail	N	N	N	Y	Y	Y	Fire Trail also includes walking track from Nomads Picnic Area.
Marven Fire Trail	N	N	N	Y	Y	Y	Provides access to private property, is otherwise no through access.
Ballards Peak Fire Trail	N	N	N	Y	Y	Y	Previous mining trail that is now overgrown.

(iii) Walking tracks

Torrington SCA provides excellent opportunities for walkers, especially those who are self-reliant and seek solitude. Most of the special landscape features of the SCA can only be reached by walking. Visitors may walk anywhere in the SCA, including fire trails and off the track network.

There are currently two constructed walking tracks in the SCA, at Mystery Face and Thunderbolts lookout. A lookout platform and walking track was constructed to Thunderbolts lookout to ensure public safety and ease of access to the area. The walking track will be maintained to its current standard. Currently, there is no interpretation at the lookout, where it is proposed to develop an interpretation display to indicate key landscape features.

Community consultation has indicated that there are other popular features, such as Blather falls and Bismuth falls, which have frequent visitation. The NPWS will investigate these areas to determine public demand for additional walking tracks to such features.

(iv) Horse riding

Horse riding occurs in the SCA, although levels of use are thought to be low. Horse riding may have adverse impacts on some areas of the SCA. These include areas with erodible or wet soils, steep slopes as well as potential impacts on endangered flora and the spread of weeds.

Horse riding will continue to be undertaken in the SCA in accordance with the NPWS horse riding policy. Horse riding will be permitted on those trails outlined in table 2, but will not be permitted on walking tracks or off trails. This should ensure any adverse impacts from horse riding, or potential risk to walkers and the horse riders themselves, is minimised.

(v) Cycling

Cycling is a minor activity in the SCA. Cycling will be permitted on the roads and management trails in the SCA, including those not available for public vehicle or horse access, unless otherwise indicated by sign or notice. Cycling will not be permitted on walking tracks or off-road.

Management objectives (for section 4.4.2)

- ◇ Provide appropriate access for a range of nature-based recreation opportunities.
- ◇ Provide appropriate facilities consistent with the recreational setting and level of use.
- ◇ Manage visitor use and access to minimise environmental impacts and maintenance costs.
- ◇ Promote the principles of minimum impact recreation.

Management strategies (for section 4.4.2)

- ◆ The NPWS will maintain the road and trail network for which it is responsible (see map).
- ◆ Trails that are considered to be non-essential for fire suppression and other management purposes, and are not required for recreational purposes or access to apiculture or mining interest areas, will be closed and rehabilitated (refer section 4.3.1).
- ◆ Public vehicular use will only be permitted on the roads and trails shown on the map (refer section 4.3.1). Locked gates will be installed on trails where shown on the map. The gates

on Carpet Snake Fire Trail will be temporarily closed during wet weather to prevent damage to the trail.

- ◆ The NPWS will notify the community of any trail closures due to wet weather or fire by erecting temporary signs in Torrington.
- ◆ Old mining trails will not be available for public access and may be closed and regenerated.
- ◆ Subject to a walking track feasibility study and appropriate environmental assessment, tracks may be constructed to Chinese cultural sites, Ugly Corner and/or Bismuth Falls.
- ◆ The current level of visitor facilities will be maintained. Any proposed increase will require an assessment of current visitor use and projected needs, environmental assessment and a cost-benefit analysis of providing and maintaining additional facilities. Any significant expansion of existing visitor facilities, or the development of any new facility area, will require an amendment to this plan of management.
- ◆ The NPWS will not provide rubbish receptacles in the SCA and will develop an education campaign so that visitors are better informed about minimal impact recreation activities and locations where rubbish disposal facilities are available.
- ◆ Horse riding will continue in the SCA on those roads and trails indicated in table 2.
- ◆ Horses are not permitted into recreation sites (such as the camping areas along Blatherarm Road), on walking tracks, or off roads or trails.
- ◆ Cycling will be permitted on the roads and fire trails in the SCA unless otherwise indicated by sign or notice.
- ◆ Cycling will not be permitted on walking tracks or off the road and trail network, but may use management trails precluded from public vehicular use unless indicated by sign or notice.
- ◆ Relevant interpretation material will contain educational information on minimal impact recreation practices, SCA regulations and management intentions for the SCA.
- ◆ Interpretation displays at camping and picnic areas will include advice against drinking water from the creeks, as water collected from the SCA may not be suitable for human consumption.

4.4.3 Fossicking

Many visitors are attracted to the SCA because of its fossicking potential. Fossicking is a popular recreational activity within the region with many commercial operators offering fossicking opportunities on private land. Therefore an integrated regional approach to the provision of fossicking opportunities and other recreation activities will be pursued with local tourist centres, promotions boards, commercial operators and fossicking groups.

Recreational fossicking can potentially impact upon the natural, cultural and other recreational values of the SCA. Threats to water quality and soil erosion are also a concern, particularly in Blather Creek.

Fossickers will be required to adhere to the minimal impact fossicking guidelines contained in the *Mining (General) Regulation 1992*. NPWS will promote ecologically sustainable recreational use through interpretive material such as displays and other visitor literature.

Management objectives

- ◇ Minimise the impacts from fossicking on the natural, cultural and other recreational values of the SCA.
- ◇ Establish a coordinated approach to managing and providing fossicking activities throughout the region.

Management strategies

- ◆ A program will be established to monitor the impacts of fossicking on the values of the SCA, and based on the outcomes of the monitoring program, appropriate management decisions will be made in consultation with park user groups (refer to section 4.6).
- ◆ The NPWS will provide information on fossicking site locations and minimal impact guidelines, outlined in *Mining (General) Regulation 1992*, for best-practice fossicking techniques.
- ◆ The NPWS will liaise with local councils, tourism promotions boards, tourist information centres and the Glen Innes Gem and Mineral Club to look at additional opportunities for promoting and providing fossicking activities across the region.
- ◆ In areas disturbed by previous mining and fossicking activities, and where not identified as significant cultural heritage sites, the NPWS will liaise with the DMR, DLWC, EPA and mining interests to develop rehabilitation programs and to seek assistance for their implementation.
- ◆ In areas with high nature conservation values, cultural heritage values, or threatened species, fossicking will be monitored to ensure impacts are managed within appropriate guidelines.
- ◆ The NPWS will conduct risk assessments of existing mining, mineral exploration and fossicking sites where there is a potential risk to public and staff safety.

4.4.4 Group activities and commercial operators

The trend towards nature-based tourism and other commercial uses of protected areas is steadily increasing on the Northern Tablelands, largely due to the promotional efforts by regional based tourism committees. Torrington SCA has a valuable role to play in the provision of regional tourism opportunities, however, tourism adds to the demand on management resources through increased visitation and the need to manage visitor impacts.

The NPWS requires all businesses, community organisations and groups who conduct various types of commercial recreation programs, outdoor adventure activities, military training exercises and emergency services training in the SCA, to submit a license application in accordance with NPWS policy and the *NPW Act*. Operating guidelines need to be developed in consultation with the commercial tourism industry to ensure recreation activities and programs are consistent with the management objectives of the SCA.

Commercial activities occurring in the SCA include horse riding, fossicking, orienteering, bush navigation and walking tours to Thunderbolts lookout and Mystery Face.

There are also a number of organisations and groups who conduct various types of outdoor adventure activities, military training exercises and emergency services training in the SCA. These types of activities can create significant localised environmental and social impacts due to the scale of operations and type of activity. In accordance with NPWS policies, these

organisations and groups are required to have consent authority and conditions of conduct will apply.

Management objectives

- ◇ Cooperate with the local tourism industry in the provision of information and recreational opportunities.
- ◇ Ensure commercial activities are consistent with the protection of natural and cultural values.
- ◇ Encourage commercial tour operators to promote an appreciation and understanding of those values.
- ◇ Minimise the social and environmental impacts resulting from group activities and commercial recreation tours.

Management strategies

- ◆ If necessary, limits may be placed on the number of commercial operators and passengers, and the frequency and location of tours. This will be done to avoid unacceptable impacts on the natural, cultural and recreational values or setting of the SCA, where identified in a visitor, or visitor impact, monitoring program.
- ◆ Applications for new or renewed commercial tourism operations will need to be consistent with this plan. Licences will not be approved if they are likely to cause unacceptable environmental impacts or conflict with the purpose of management or other SCA users.
- ◆ Where practical, the NPWS will provide information and training to commercial operators, regional tourist authorities, Glen Innes and Severn Tourism Promotion Boards and regional tourist information centres to enhance the quality of commercial tours conducted in the SCA and to ensure natural and cultural values are protected.

4.4.5 Interpretation programs and provision of information

Interpretation programs can enrich the experiences of visitors by promoting a better understanding of the SCA's values and features. It is an important aspect of reserve management because of its potential to influence attitudes and behaviour, resulting in support for management programs, which will assist in achieving management objectives.

Interpretation displays in key recreation locations in the SCA will emphasise important natural and cultural values and management programs aimed at protecting these values. Displays will incorporate reserve regulations and minimum impact practices to reduce potential threats to the environment as well as reducing incompatibility between different types of recreation activities. These interpretation displays will also provide visitor safety information, such as warnings of mine shafts, apiary sites and unsafe drinking water.

An important aspect of providing information is to ensure that neighbours, the local community and other stakeholders are informed of reserve management programs. Of particular importance to the rural community are fire and pest species management programs.

Management objectives

- ◇ Establish interpretative material that promotes understanding, appreciation and enjoyment of the natural and cultural values and conservation objectives of the SCA.
- ◇ Provide information that promotes the management of the SCA and the role of the NPWS.

Management strategies

- ◆ Promotion, interpretation and education programs will incorporate the following themes:
 - natural and cultural values and significance of the SCA;
 - management programs and options to protect those values;
 - Aboriginal, Chinese and European cultural history;
 - principles and purpose of ecologically sustainable resource use and the need to adopt minimal impact recreation activities in Torrington SCA and
 - nature-based recreation opportunities.
- ◆ Information will be provided to stakeholders and neighbours conveying information on management issues, objectives and programs in the SCA.
- ◆ Torrington SCA will be promoted as part of a regional system of reserves in cooperation with local tourism authorities. If required, information displays will be developed for the Glen Innes, Inverell and Tenterfield information centres.
- ◆ The feasibility of conducting NPWS Discovery Ranger and NPWS Aboriginal Discovery Ranger programs in the SCA will be investigated.
- ◆ Interpretative signs will be provided at Blatherarm camping area, Nomads picnic area, Mystery Face track, Thunderbolts lookout and the town of Torrington.
- ◆ All interpretive materials will include a statement to alert visitors to the potential danger of mine shafts when walking through the area.
- ◆ A self-guided educational walk will be developed on the Mystery Face track to provide visitors with natural and cultural heritage information.

4.5 Management of Existing Uses

4.5.1 Mining and mineral exploration

Torrington SCA's rich mineral and semi-precious gemstone deposits have been identified as an important mineral exploration and potential mining area in New South Wales. Approximately 10,000 hectares, or 30%, of the SCA is covered by historical mining leases, current mining leases, applications for mining leases, mineral exploration leases and areas surveyed for mining potential.

As an existing interest there are various exemptions under the EPA Act, NPW Act and the Mining Act with respect to environmental assessment requirements and reporting protocols of the DMR to the NPWS. The DMR is required under the EPA Act to undertake an environmental assessment for mining activities in consultation with the NPWS through the issuing and reissuing of licences for mineral exploration and mining.

DMR and DLWC are the lead authorities for mining, mineral exploration and mine site rehabilitation. NPWS will liaise with these departments to have input into any mining, exploration and rehabilitation activities within the SCA. To assist with this NPWS will seek information on leases and the lease conditions for any mineral exploration and mining activity within Torrington SCA.

Management objectives

- ◇ The Glen Innes Area, DMR, other relevant agencies, mining companies and the community work cooperatively to ensure that mining and mineral exploration activities are undertaken using best-practice environmental management.

Management strategies

- ◆ The NPWS will seek to obtain information on the existing and future interest areas for mining and mineral exploration operations in the SCA.
- ◆ The NPWS will investigate public safety implications and responsibilities for the DMR and the NPWS with respect to current and historical mine sites in the SCA. Where risks to public safety are identified, remedial action will be undertaken.
- ◆ In cooperation with mining companies, DLWC and DMR, the NPWS will establish a framework to exchange information and ensure best-practice management of mining and mineral exploration activities in the SCA.

4.5.2 Grazing

When Torrington SCA was dedicated in April 1996 the NPWS acquired 12 grazing licences of which nine remain. These licences are located in the peripheral areas of the SCA. Grazing in the SCA is managed in accordance with licence conditions.

Existing interests, which include grazing licences, are recognised in the NPW Act. Prior to the dedication of the SCA, the Department of Land and Water Conservation issued annual licences. The NPWS agreed to honour the term of these grazing licences and they have continued to be issued annually subject to compliance with licence conditions.

Stock grazing can contribute to soil compaction, increased soil erosion, introduction of weed species, pollution of waterways, damage to threatened plant species and changes in vegetation composition. Therefore, in accordance with the *NPW (Land Management) Regulations*, grazing of domestic stock is not an appropriate activity in the SCA. The NPWS will phase out grazing in the SCA by January 2005.

Management objectives

- ◇ Manage grazing in accordance with NPWS policy and licence conditions.
- ◇ Remove grazing from the SCA by January 2005.
- ◇ Develop cooperative management arrangements with the local graziers to ensure that activities are carried out in a manner that reduces impacts on the natural ecology of the SCA.

Management strategies

- ◆ The NPWS will liaise with the Department of Agriculture, DLWC and grazing licensees to determine appropriate stock carrying capacity for each licensed area.
- ◆ Graziers will be required to report site use details, such as the period of use and stock numbers to the NPWS.
- ◆ No new grazing licences will be issued, and when existing licences are surrendered they will not be renewed.
- ◆ Grazing will not be permitted in the SCA following a phasing out program concluding in January 2005.

- ◆ A grazing licence may be cancelled at any time if licence conditions are not complied with.

4.5.3 Apiculture

There are 41 apiary sites located along many of the management trails throughout the SCA. Apiary leases will be managed in accordance with NPWS policy.

Apiarists will be provided with access to their apiary sites along those trails where gates have been installed to prevent public access.

The NPWS will liaise with the relevant Apiarists Association to ensure that potential impacts to the environment and public safety are minimised.

Management objectives

- ◇ Manage apiculture in accordance with NPWS policy and licence conditions.
- ◇ Develop cooperative management arrangements with the Inverell Apiarist Association to ensure that activities are carried out in an ecologically sustainable manner.

Management strategies

- ◆ In consultation with the licensee the NPWS will seek to relocate the apiary site where apiary sites are close to established recreation sites, or where the provision of access to sites is difficult or costly to maintain.
- ◆ Where appropriate, the NPWS will install public warning signs to indicate that apiary sites are located in the SCA.
- ◆ Signs will be placed at each apiary site for site identification purposes where practicable.
- ◆ Where vehicle access to apiary sites is required away from the existing road and fire trail network, specific approval must be obtained from the Service to use and/or maintain these access routes.
- ◆ A list of leaseholders will be included in the Northern Tablelands Region Incident Procedures so that they can be notified of any prescribed burning programs or wildfire occurrences.
- ◆ The NPWS will liaise with the Inverell Apiarists Association and the Department of Agriculture to establish cooperative approaches to managing apiculture in the SCA.
- ◆ No new apiary leases or licences will be issued in the SCA in accordance with NPWS policy.

4.6 Research and monitoring

The function of research and monitoring in the SCA is to assist in the understanding of its resources and values, ecological processes and to identify any threats. The outcomes of research and monitoring are important for future management programs as well as providing a mechanism to measure management performance.

The SCA contains valuable research opportunities, and its proximity to the University of New England and Southern Cross University makes it an attractive and convenient area to study. Programs may include recreational use patterns and user impacts, hazard or risk assessment and fire behaviour, threatened species ecology, habitat requirements and distribution, cultural heritage survey and assessment, adequacy of conservation programs, and impacts of grazing and introduced honey bees on the natural environment.

Management objectives

- ◇ Encourage relevant research opportunities, particularly those that can benefit the management of the SCA.
- ◇ Improve the management of the SCA by incorporating the relevant outcomes of research and monitoring programs into management programs.

Management strategies

- ◆ NPWS will undertake and/or encourage research and monitoring programs to update knowledge and information on the natural and cultural values of the SCA, identify potential threats and adjust management prescriptions as required.
- ◆ The NPWS will seek expressions of interest from appropriate tertiary institutions to undertake research programs in the SCA.
- ◆ Priority for research and monitoring programs will be given to areas identified in this plan as benefiting from such research.
- ◆ Where appropriate, the data and findings from research will be recorded in the NPWS Wildlife Atlas database.
- ◆ Fossicking (and any other recreational use if considered necessary) will be monitored (refer to sections 4.4.1, 4.4.3 and 4.4.4).

4.7 Management of Reserve Operations

4.7.1 Acquisition of unformed Crown roads

There are three unformed Crown Roads that occur within the SCA but are excised from it. They are located in remote areas of the SCA and do not provide any strategic access or essential fire management zones. The addition of these areas into the SCA would consolidate the boundary and provide additional protection to the SCA.

Management objective

- ◇ Pursue the acquisition of unformed Crown Roads for inclusion into the SCA.

Management strategy

- ◆ The NPWS will pursue acquisition of the unformed Crown Roads that were not included in the original reservation of the SCA.

4.7.2 Domestic animals

Domestic stock currently access the SCA from the Torrington Town Common along the Dutchmans and Emmaville Roads as well as from some neighbouring properties. Domestic stock can have a significant impact on threatened plant species, damage cultural sites and disturb visitors (refer to section 4.5.2).

Where unlicensed domestic stock are found in the SCA, the NPWS may take necessary steps to remove the stock from the SCA.

Unless consent has been given, domestic dogs and cats are prohibited from entering the SCA under the *NPW Act* and Regulations. They can have unacceptable impacts in protected areas by disturbing or killing native wildlife, threatening public safety, reducing visitor

enjoyment and dogs may affect neighbouring domestic stock. Consequently domestic dogs (other than seeing eye and assistance dogs) and cats are not permitted in the SCA.

Management objectives

- ◇ Prevent unlicensed domestic stock entering the SCA from the Town Common and neighbouring properties.
- ◇ Manage activities and environmental impacts so that they do not conflict with the natural, cultural and recreational values of the SCA.

Management strategies

- ◆ Boundary fencing will be constructed along Dutchmans Road and along Emmaville Road to prevent domestic stock from entering the SCA.
- ◆ The NPWS will provide fencing assistance to neighbouring landholders in accordance with NPWS fencing policy.
- ◆ Domestic dogs, other than seeing eye and assistance dogs, will not be permitted in the SCA.
- ◆ The use of dogs may be permitted for mustering or other authorised management operations provided written authorisation has been obtained from the NPWS Manager.

4.7.3 NPWS storage facility

To facilitate management of the SCA, a storage facility has been established on Rural Fire Service land in Torrington village.

A loading ramp has been established on Torrington town fire trail. This site is also an emergency helipad, but will not become the focal point for helicopter operations. Previous aerial operations have been conducted from neighbouring lands within Torrington township. The NPWS will liaise with the relevant landowners to continue to use these areas for future aerial operations.

Management objective

- ◇ Maintain NPWS management infrastructure for the SCA.

Management strategies

- ◆ The NPWS will liaise with the Rural Fire Service to continue to use the storage facility in Torrington village.

4.7.4 Torrington land-fill tip

Property surveys have found that the Torrington town land-fill tip along Silent Grove Road is partly located in the SCA. Severn Shire Council has closed this site and is currently regenerating the area. A new landfill has been constructed outside the SCA. The NPWS will continue to liaise with Council to ensure that potential impacts from the both sites are minimised. No new landfills will be permitted to be constructed within the SCA.

Management objective

- ◇ Manage activities and environmental impacts so that they do not conflict with the natural, cultural and recreational values of the SCA.

Management strategies

- ◆ The NPWS will liaise with Severn Shire Council to ensure that its interests concerning soil and water contamination, site re-vegetation and rubbish dumping are adequately addressed in rehabilitating the existing Torrington tip site.
- ◆ The SCA will not be used for any future land-fill tip sites.

4.7.5 Gravel extraction pits

There are two small gravel extraction sites located in the SCA along the Emmaville Road that have been used by the Severn Shire Council (TRRT 1995a). The NPWS will investigate and evaluate these sites for continued use. Where it is determined that closure is required, the NPWS will liaise with Council to identify appropriate management strategies for cessation of operations and site rehabilitation.

Management objective

- ◇ Manage activities and environmental impacts so that they do not conflict with the natural and cultural values of the SCA.

Management strategies

- ◆ The NPWS will evaluate gravel extraction operations and, if required, will liaise with Severn Shire Council to identify appropriate management strategies for cessation of operations and site rehabilitation.
- ◆ No new gravel extraction sites will be permitted in the SCA.

4.7.6 Public roads adjoining Torrington SCA

Public road maintenance operations on Silent Grove Road in the northern part of the SCA have encroached upon the SCA. Gravel extraction sites, excessive removal of vegetation and poor drainage structures in these areas have contributed to significant road damage and sedimentation in the SCA.

Management objective

- ◇ Minimise the environmental impact from road construction and maintenance operations.

Management strategies

- ◆ The NPWS will install park boundary identification signs in key areas around the periphery of the SCA to assist Shire road maintenance crews.
- ◆ The NPWS will liaise with Severn and Tenterfield Shire Councils and the DLWC to ensure that road maintenance operations are carried out in accordance with the EPA guidelines and with minimal disturbance to roadside vegetation.

5.0 Plan Implementation

This plan is part of a system of management developed by the NPWS. The systems includes the NPW Act, the NPWS Corporate Plan, the NPWS Field Management Policies, established conservation and recreation policies and strategic planning at Corporate, Regional and Area levels.

The implementation of this plan of management will be undertaken within the annual programs of the NPWS Northern Tablelands Region. Priorities are subject to on-going review within which works and other activities carried out in the SCA will be evaluated in relation Regional and Area priorities as well as any specific requirements of the Minister for the Environment and/or the Director-General NPWS and the objectives set out in this plan.

The environmental impact of all development proposals will continue to be assessed at all stages of the development and any necessary investigations will be undertaken in accordance with established environmental assessment procedures.

In accordance with section 81 of the *NPW Act*, the NPWS shall implement this plan, and operations that do not comply with this plan will not be permitted in the SCA. However, if after adequate investigation, operations not included in the plan are found to be justified, this plan may be amended in accordance with Section 75A(6) of the Act.

As a guide to the orderly implementation of this plan, relative priorities for identified activities are summarised below. Priorities are based on:

High Those actions which are imperative to the achievement of the management objectives set out in this Plan and/or which need to be implemented in the near future on the basis that not to undertake the work will result in:

- unacceptable degradation of the natural and cultural values or physical resources of the SCA;
- significant additional costs associated with rehabilitation at a later date, or
- an unacceptable risk to public safety.

Medium Those actions that are necessary to achieve the management objectives set out in this Plan, but will be undertaken as resources become available since the time frame for their implementation is not so critical.

Low Those actions which are desirable to achieving the management objectives set out in this Plan, but can wait until resources are available.

Implementation of key actions

Plan ref.	Summary of key actions arising from this plan (refer to plan for full wording)	Priority
4.1.1	Landscape disturbance will be identified and stabilised in the SCA.	Med
4.1.1	Monitor water quality at strategic locations in the SCA	High
4.1.2	An environmental assessment will be carried out for all future activities that are likely to have an impact on significant vegetation types and species in the SCA.	High
4.1.2	A vegetation monitoring program will be established to provide information on the distribution and abundance of ROTAP and key indicator species.	Med
4.1.2	Vegetation monitoring programs will be established in popular fossicking areas to assess the impact of fossicking on ROTAP species and the aquatic environment.	Med
4.1.2	Interpretation displays and material will be developed to enhance public awareness of the ecological values of the SCA.	Med
4.1.3	Collate available information on distribution, habitat requirements and potential threats for the threatened and significant fauna species in the SCA.	Med
4.1.3	A fauna survey with particular emphasis on significant species will be undertaken in the SCA to update information provided in the Smith and Smith (1991) report.	Med
4.1.3	Target fauna surveys will be encouraged for Fawn-footed Melomys, Tiger Quoll, and Eastern Long-eared Bat.	Med
4.1.3	Interpretation displays and material will be developed to enhance public awareness of the native fauna species, their management requirements and other ecological values.	Med
4.2.1	The NPWS will investigate the feasibility of providing on-site interpretation for selected sites in the SCA.	Med
4.2.2	The NPWS will provide interpretative information for visitors to the area to gain an understanding and appreciation of the European and Chinese heritage values.	Med
4.2.2	The NPWS will provide on-site interpretation for selected sites in the SCA. Priority will be given to those sites that are within close proximity to public access areas.	Med
4.2.2	Appropriate fire management operations will be carried out to reduce the risk of bushfire damage to cultural sites and places.	High
4.2.2	The management recommendations for site protection made by Burke (1998) will be evaluated and an implementation program developed..	High
4.3.1	A reserve fire management plan for the SCA will be prepared.	High
4.3.1	The NPWS will pursue opportunities to continue the fire ecology research program established in 1998, to provide critical information on fire responses and plant biology of the ROTAP and indicator species.	Med
4.3.1	Detailed fire history information for the SCA will be obtained.	Med
4.3.1	Subject to the bushfire hazard and an environmental assessment, prescribed burning programs will be undertaken where necessary to protect life and property.	High
4.3.1	Bushfire risk mapping will be undertaken to identify areas of potential high fire risk.	High
4.3.1	All new tracks and/or other areas disturbed by fire suppression activities will be rehabilitated as soon as possible after the fire event.	High
4.3.1	Prescribed burning programs will be undertaken on a priority basis to protect life and property subject to bushfire hazard, risk and environmental assessment.	High
4.3.1	Monitoring programs will be developed to assess the response of rare plant populations after fire, based on the management recommendations by Clarke and Fulloon (1999).	Med
4.3.1	Management trails and any other access routes will be assessed for their strategic value for fire management. Trails that are considered to be non-essential for fire suppression, and are not required for recreational purposes or access to apiculture or mining interest areas, will be closed and rehabilitated.	High
4.3.1	Obtain and map records of fire history and bushfire risk to determine priority areas for prescribed burning programs, protect life and property and maintain ecological diversity.	High
4.3.2	A pest species management plan will be prepared for the SCA.	High
4.3.2	Weed control programs will be undertaken in disturbed areas such as mine sites, management trails and popular recreation areas.	Med
4.3.2	The known occurrence, distribution and density of pest species will be periodically mapped as part of the monitoring strategy.	Med

4.4.1	Undertake visitor surveys in the SCA to determine visitor profiles, use patterns, visitor numbers and/or recreation preferences.	Low
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Plan ref.	Summary of key actions arising from this plan (refer to plan for full wording)	Priority
4.4.1	Monitor visitor use for unacceptable environmental impacts. Where there are unacceptable impacts the NPWS may temporarily close these areas to carry out necessary repair and or rehabilitation programs.	Med
4.4.2	The NPWS will maintain the road and trail network for which it is responsible (see map).	High
4.4.2	Trails that are considered to be non-essential for fire suppression and other appropriate purposes will be closed and rehabilitated.	Med
4.4.2	Public vehicular use will only be permitted on the roads and trails shown on the map. Locked gates will be installed on roads and trails where shown on the map. The gates on Carpet Snake Creek Trail will be only temporarily closed during wet weather.	High
4.4.2	Old mining trails will not be available for public access and may be closed and regenerated.	Med
4.4.2	Subject to a walking track feasibility study and appropriate environmental assessment, tracks may be constructed to Chinese cultural sites, Ugly Corner and/or Bismuth Falls.	Low
4.4.2	The current level of visitor facilities will be maintained. Any proposed increase will require an assessment of current visitor use and projected needs, environmental assessment and a cost-benefit analysis of providing and maintaining additional facilities.	High
4.4.2	The NPWS will not provide rubbish receptacles in the SCA and will develop an education campaign so that visitors are better informed about minimal impact recreation activities and locations where rubbish disposal facilities are available.	High
4.4.3	A program will be established to monitor the impacts of fossicking on the values of the SCA, and based on the outcomes of the monitoring program, appropriate management decisions will be made in consultation with park user groups.	Med
4.4.3	The NPWS will conduct risk assessments of existing mining, mineral exploration and fossicking sites where there is a potential risk to public and staff safety.	High
4.4.4	Where practical, the NPWS will provide information and training to commercial operators, local government, relevant tourist bodies and tourist information.	Med
4.4.5	Information will be provided to stakeholders and neighbours conveying information on management issues, objectives and programs in the SCA.	Med
4.4.5	Torrington SCA will be promoted as part of a regional system of reserves in cooperation with local tourism authorities. If required, information displays will be developed for the Glen Innes, Inverell and Tenterfield information centres.	High
4.4.5	The feasibility of conducting NPWS Discovery Ranger and NPWS Aboriginal Discovery Ranger programs in the SCA will be investigated.	Low
4.4.5	Interpretative signs will be provided at Blatherarm camping area, Nomads picnic area, Mystery Face track, Thunderbolts lookout and the town of Torrington.	High
4.4.5	A self-guided educational walk will be developed on the Mystery Face track to provide visitors with natural and cultural heritage information.	Med
4.5.1	The NPWS will investigate public safety implications and responsibilities for the DMR and the NPWS with respect to current and historical mine sites in the SCA. Where risks to public safety are identified, remedial action will be undertaken.	High
4.5.1	In cooperation with mining companies, DLWC and DMR, the NPWS will establish a framework to exchange information and ensure best-practice management of mining and mineral exploration activities in the SCA.	Med
4.5.3	In consultation with the licensee the NPWS will seek to relocate the apiary site where apiary sites are close to established recreation sites, or where the provision of access to sites is difficult or costly to maintain.	Med
4.5.3	Where appropriate, the NPWS will install public warning signs to indicate that apiary sites are located in the SCA.	High
4.5.3	Signs will be placed at each apiary site for site identification purposes.	Low
4.6	The NPWS will seek expressions of interest from appropriate tertiary institutions to undertake research programs in the SCA.	Low
4.6	Where appropriate, the data and findings from research will be recorded in the NPWS Wildlife Atlas database.	Med
4.6	Fossicking (and any other recreational use if considered necessary) will be monitored.	Med

Plan ref.	Summary of key actions arising from this plan (refer to plan sections for full wording)	Priority
4.7.1	The NPWS will pursue acquisition of the unformed Crown Roads that were not included in the original reservation of the SCA.	Med
4.7.2	Boundary fencing will be constructed along Dutchmans Road and along Emmaville Road to prevent domestic stock from entering the SCA.	Med
4.7.5	The NPWS will evaluate gravel extraction operations and, if required, will liaise with Severn Shire Council to identify appropriate management strategies for cessation of operations and site rehabilitation.	High
4.7.6	The NPWS will install park boundary identification signs in key areas around the periphery of the SCA to assist Shire road maintenance crews.	High

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Appendix 1 Significant plant species recorded in Torrington State Conservation Area (Clarke *et al.* 1998).

Species name	TSC Act	ROTAP code
<i>Acacia brunioides ssp. granitica</i>		3RC-
<i>Acacia burbridgeae</i>		3RC
<i>Acacia alatisepala</i>		3RC
<i>Acacia macnuttiana</i>	E	2VCi
<i>Acacia pubifolia</i>	E	2VC-
<i>Acacia williamsiana(ms)</i>		2RCa
<i>Almaleea cambagei</i>	E	2V
<i>Babingtonia odontocalyx</i>		2V
<i>Boronia granitica</i>	E	3VC-
<i>Brachyloma saxicola</i>		3RCa
<i>Callistemon pungens</i>		3R
<i>Cryptandra lanosiflora</i>		3RCa
<i>Derwentia arenaria</i>		3RC-
<i>Dodonaea hirsuta</i>		3RC-
<i>Eriostemon myoporoides ssp. epilosus</i>		3RCa
<i>Eucalyptus caleyi subsp. ovoidenii</i>		2V
<i>Eucalyptus mckieana</i>	E	2V
<i>Eucalyptus youmanii</i>		2R
<i>Grevillia beadleana</i>	E	3ECi
<i>Hakea macrorrhyncha</i>		3RC-
<i>Hibbertia sp. B</i>	V	2K
<i>Homoranthus lunatus</i>	V	2VCi
<i>Kunzea bracteolata</i>		3RC-
<i>Macrozamia plurinervia</i>		3RC-
<i>Olearia gravis</i>		3KC-
<i>Persoonia terminalis subsp. terminalis</i>		2R
<i>Phebalium ambiens</i>		3RC
<i>Phebalium glandulosum ssp. eglandulosum</i>	E	2Vci
<i>Phebalium rotundifolium</i>		3RC-
<i>Prostanthera staurophylla</i>	V	2R
<i>Pomaderris queenslandica</i>	E	-
<i>Pseudanthus ovalifolius</i>	E	-
<i>Pultenaea stuartiana</i>	V	3VC-
<i>Rulingia hermanniifolia</i>		3Rca
<i>Rutidosia heterogama</i>	V	2Vca
<i>Thelionema grande</i>		3RC-
New taxa (specimen backed)		
<i>Boronia sp. aff. bipinnata</i>		3VC-
<i>Boronia sp. aff. microphylla</i>		2RC-
<i>Callistemon sp. aff. flavovirens</i>	V	2RC-
<i>Homoranthus sp. nov.</i>		2EC-
<i>Plectranthus sp. nov.</i>		2EC-
<i>Eucalyptus sp. nov.</i>		2EC-
Requires specimen confirmation		
<i>Cynanchum elegans</i>	E	3Eci

<i>Leucopogon confertus</i>	E	3E
<i>Melaleuca groveana</i>	V	3RC-

Appendix 2 Significant vertebrate fauna species recorded in Torrington SCA and surrounding lands (Smith and Smith 1991).

Scientific name	Common name	Conservation significance
<i>Xanthomyza phrygia</i> *	Regent Honeyeater	Endangered
<i>Poephila cincta ssp cincta</i> *	Black-throated finch	Endangered
<i>Ninox strenua</i>	Powerful Owl	Vulnerable
<i>Neophema pulchella</i>	Turquoise Parrot	Vulnerable
<i>Falco peregrinus</i>	Peregrine Falcon	Vulnerable
<i>Lophoictinia isura</i> *	Square-tailed Kite	Vulnerable
<i>Calyptorhynchus lathami</i>	Glossy Black Cockatoo	Vulnerable
<i>Aepyprymnus rufescens</i> *	Rufous Bettong	Vulnerable
<i>Dasyurus maculatus</i>	Tiger Quoll	Vulnerable
<i>Phascolarctos cinereus</i>	Koala	Vulnerable
<i>Nyctophilus bifax</i>	Eastern Long-eared Bat	Vulnerable
<i>Macropus dorsalis</i> *	Black-striped Wallaby	State significance
<i>Aviceda subcristata</i>	Pacific Baza	State significance
<i>Cyclorana brevipes</i> *	Short-footed Frog	State significance
<i>Corvus tasmanicus</i>	Forest Raven	Regional significance
<i>Underwoodisaurus sphyrurus</i>	Border thick-tailed gecko	Vulnerable
<i>Melomys cervinipes</i>	Fawn-footed Melomys	Regional significance

Notes: Endangered refers to, Schedule 1 of the *Threatened Species Conservation Act 1996*.

Vulnerable refers to, Schedule 2 of the *Threatened Species Conservation Act 1996*.

State and regional significance are terms used by Smith and Smith (1991).

* = Recorded in the area but not specifically recorded in the SCA.

Appendix 3: Vegetation types recorded in Torrington SCA - their descriptions and threats.

Community	Description	Threats
<p>Sedge - heath complex on poorly drained soils. <u>Sedge-heath complex.</u></p>	<p>This vegetation type is associated with the poorly drained areas of the granite batholith on the edge of the central sedimentary area. It is restricted to this area above 1000m mostly on flat country but occasionally on hillslopes and makes up less than 0.5% of the SCA. The sedge-heath complex is thought to be the most westerly wet heaths that have floristic affinities with those in the east and extending down the great divide.</p>	<p>Several heaths have been disturbed by mining, draining and introduced animals. Grazing by introduced animals threatens <i>Almaleea cambagei</i> populations. Too frequent or infrequent fires are also a threat to this community. Many heaths occur outside the SCA.</p>
<p>Grassy forest complex on metasediments. <u>Pendant grassy forest:</u> <i>Eucalyptus brunnea</i> & <i>E. caliginosa</i>. <u>Pendant grassy forest:</u> <i>Eucalyptus melliodora</i> & <i>E. caliginosa</i></p>	<p>This vegetation type is associated with the metasediments of the central sedimentary area and Torrington Pendant. Grassy forests are poorly reserved on the New England Tableland, only about 1.4% of type 2b is contained in the SCA while type 2a is found in the State Forest and is not represented in the SCA.</p>	<p>Most of this vegetation type occurs outside the SCA on private land and State Forest. Threats include; timber collection, mining, land clearing and grazing. Invasion by exotic perennial grasses may threaten the integrity of this community.</p>
<p>Shrubby forests and woodlands on granite. <u>Shrubby forest:</u> <i>Eucalyptus andrewsii</i>, <i>E. brunnea</i> & <i>E. williamsiana</i>. <u>Shrubby low forest:</u> <i>Eucalyptus andrewsii</i> & <i>mixed stringybark</i>. <u>Shrubby woodland:</u> <i>Eucalyptus andrewsii</i>, <i>E. prava</i> & <i>Callitris endlicheri</i>.</p>	<p>Type 3a is associated with the acidic sandy soils adjacent to the swamps in the poorly drained granite areas. Types 3b and 3c are found in coarse sandy soils on the low relief and dissected landscapes of the granite batholith with a marginal occurrence of type 3b in the Catarrh Creek catchment. These vegetation types contain several species listed in the TSC Act such as; <i>Acacia macnuttiana</i> and <i>Boronia granitica</i> as well as the new taxa <i>Homoranthus sp. nov</i> and <i>Callistemon sp. aff. flavovirens</i>.</p>	<p>Frequent fires and introduced animals appear to threaten species in type 3b. Introduced animals are common on type 3b. Large areas of these vegetation types are outside the SCA and would be threatened by agricultural and land clearing activities.</p>
<p>Riparian woodlands and forests. <u>Shrubby creeklines:</u> <i>Angophora floribunda</i>, <i>Eucalyptus brunnea</i> & <i>Allocasuarina littoralis</i>. <u>Grassy creeklines:</u> <i>Angophora floribunda</i> & <i>Eucalyptus blakelyi</i>.</p>	<p>This vegetation type is found in valley floors of the granite batholith and is poorly represented in the SCA. Type 4a occurs mainly in the broader valleys, creeklines and drainage channels of the Binghi, Beardy and Oakey Creeks catchments. Type 4b is found in the Black Creek catchment associated with the sedimentary areas on the edge of granite batholith and is poorly represented in protected areas. These types contain many rare and threatened plant species including; <i>Pultenaea stuartiana</i>, <i>Callistemon pungens</i> and <i>Acacia burbidgeae</i>.</p>	<p>Fossicking activities have disturbed some areas. High incidence of grazing by introduced animals and domestic stock pose threats to some plant populations.</p>

Appendix 3 (cont): Vegetation types recorded in Torrington SCA - their descriptions and threats.

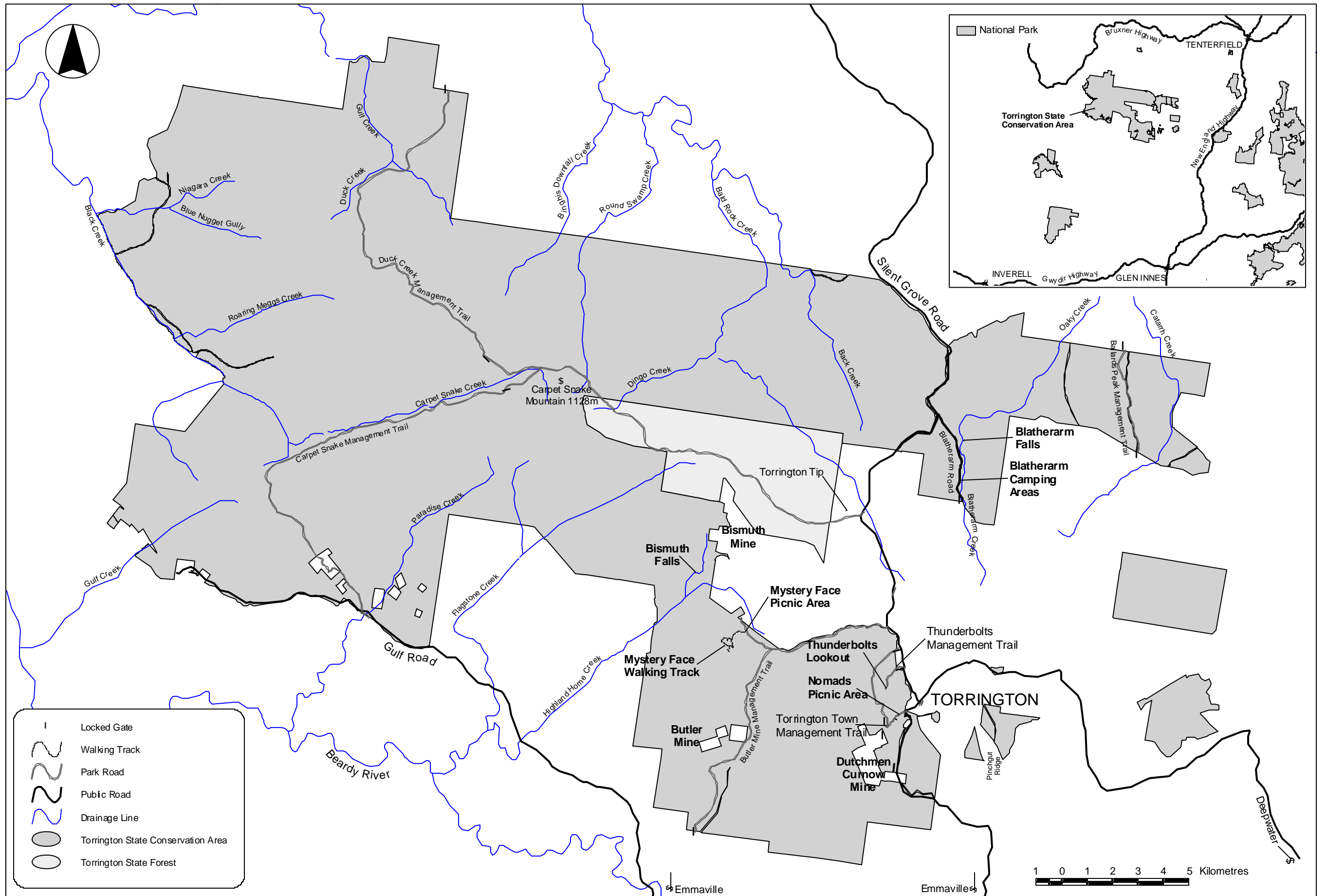
Community	Description	Threats
<p>Woodlands on granite. <u>Ironbark & Callitris woodlands:</u> <i>Eucalyptus dealbata</i>, <i>E. caleyi</i> & <i>Callitris endlicheri</i>. <u>Redgum & Apple woodlands:</u> <i>Angophora floribunda</i> & <i>Eucalyptus</i> <i>blakelyi</i></p>	<p>This vegetation type occurs in the western drainage basin around Black Creek and is poorly represented in the SCA. Type 5a is associated with the rugged and low relief landscapes of the granite batholith on exposed slopes interspersed with rocky outcrops, while type 5b is found in the valley floors on lower slopes with deeper soils. These woodlands contain several rare or threatened plant species including; <i>Hakea macrorrhyncha</i>, <i>Eucalyptus caleyi</i> spp. <i>ovendenii</i> and <i>Macrozamia plurinervia</i> which has important Aboriginal heritage significance as well as the endangered <i>Leucopogon confertus</i></p>	<p>Domestic stock and introduced animals are common in the vegetation type and threaten some plant populations. Invasion by exotic perennial grasses may threaten the integrity of this community.</p>
<p>Mole Tableland rocky outcrops <u>Outcrop heaths:</u> <i>Eucalyptus prava</i>, <i>Callitris endlicheri</i> & <i>E. andrewsii</i></p>	<p>This vegetation type is found on rocky outcrops and rock shelves in high altitudes locations in the Binghi, Beady and Oakey creek catchments. This vegetation type is only reserved in the SCA and contains many of the rare or threatened and significant plant species recorded in the Torrington area.</p>	<p>This vegetation type is only found in the SCA, introduced goats and inappropriate fire regimes threaten significant plant populations.</p>
<p>Western Rocky outcrops <u>Outcrop woodlands:</u> <i>Eucalyptus prava</i> & <i>Callitris endlicheri</i>. <u>Outcrop grassy heaths:</u> <i>Eucalyptus</i> <i>prava</i>, <i>E. dealbata</i> & <i>Callitris</i> <i>endlicheri</i>.</p>	<p>These vegetation types are associated with the rocky outcrops of the granite batholith and are only reserved in the SCA. Type 7a is found in the Western Binghi and Western Beady River catchments, while type 7b is located on more exposed outcrops in the Gulf and Black Creek catchments. There are several rare or threatened species occurring in these outcrops including; <i>Babingtonia odontocalyx</i> and <i>Phebalium rotundifolium</i>.</p>	<p>Like type 6, this vegetation type is only found in the SCA, introduced goats and inappropriate fire regimes threaten significant plant populations.</p>

Appendix 4: Habitat requirements and threats to significant fauna species recorded in Torrington SCA.

Species	Conservation Status	Habitat Requirements ¹	Threats
Regent Honeyeater <i>Xanthomyza phrygia</i>	Endangered Sch 1 <i>TSC Act</i>	Inhabits Eucalypt woodlands and open forest, migrating to regions with reliable nectar flows. Recorded in the western section of the SCA in 1979. It is still thought to occur in the SCA.	Fragmentation of habitat, land clearing for agriculture, selective removal of mature trees and competition for nectar from other large honeyeaters and introduced bees.
Powerful Owl <i>Ninox strenua</i>	Vulnerable / Rare Sch 2 <i>TSC Act</i>	Inhabits dense Eucalypt forests around the Torrington pendant. Occurring in pairs and roosting during the day in large trees. They require a large home range feeding on possums, gliders and rabbits.	Clearing and fragmentation of its forest habitat and large scale high intensity fires, where old growth trees with hollows are destroyed, will reduce availability of preferred nesting sites for the species and its prey.
Turquoise Parrot <i>Neophema pulchella</i>	Vulnerable / Rare Sch 2 <i>TSC Act</i>	Inhabits Eucalypt woodlands and drier forests, on the edges of clearings. Occurs widely in relatively large numbers throughout the SCA.	Subject to population crashes in 1880 and 1920, it has become re-established over much of its former range. Habitat areas require relatively frequent burning to stimulate plant germination of food trees.
Peregrine Falcon <i>Falco peregrinus</i>	Vulnerable / Rare Sch 2 <i>TSC Act</i>	Inhabits Eucalypt woodlands on the granite batholith and roosts in cliffs or high exposed branches near its nesting sites. Requiring a large home range, they return to regular nesting sites.	Fragmentation of forest habitat, removal of old growth trees, ingestion of pesticides causing the birds to produce thinner egg-shells. High intensity fires that destroy large areas of forage habitat, mosaic fire regimes is required.
Glossy Black-Cockatoo <i>Calyptorhynchus lathami</i>	Vulnerable / Rare Sch 2 <i>TSC Act</i>	Feeds on <i>Allocasuarina</i> and <i>Casuarina</i> species seeds in the open woodlands of the granite batholith and Catarrh Creek catchment. They require large tree hollows for nesting. Lack of suitable habitat in the SCA suggests that population numbers are relatively low.	Highly specialised species susceptible to habitat change, recorded in low numbers in the SCA due to lack of suitable habitat. Retaining habitat areas is critical. Mosaic burning required to stimulate differing age classes of <i>Allocasuarina</i> species.
Rufous Bettong <i>Aepyprymnus rufescens</i>	Vulnerable / Rare Sch 2 <i>TSC Act</i>	Inhabits dry open woodlands with a grassy understorey, particularly where dense patches of <i>Imperata cylindrica</i> occurs. Favoured areas are on the interface between cleared pastures and bushland. Hairs were recorded in predator scats by Smith and Smith (1991)	Predation by foxes and dogs, removal of habitat for grazing. High intensity fires over large areas will destroy habitat areas.

Appendix 4 (cont): Habitat requirements and threats to significant fauna species recorded in Torrington SCA.

Species	Conservation Status	Habitat Requirements ¹¹	Threats
Tiger Quoll <i>Dasyurus maculatus</i>	Vulnerable / Rare Sch 2 <i>TSC Act</i>	Inhabits Eucalypt forests and dense woodlands. The records in the SCA are close to its western distributional limit.	Competition for prey from dogs, foxes and cats, possibly susceptible to poisoning from aerial and mound baiting for dogs, foxes and cats. Loss of habitat from large scale fires.
Koala <i>Phascolarctos cinereus</i>	Sch 2 <i>TSC Act</i>	Suitable habitat exists throughout the SCA on the granite batholith, although no recordings were made by Smith and Smith (1991). Likely to occur due to the relatively high numbers recorded south-west of the Mole Tableland area.	Loss of habitat through clearing, especially selective clearing of forests on higher nutrient soils. High intensity fires over large areas can destroy mature trees.
Eastern Long-eared Bat <i>Nyctophilus bifax</i>	State Significance	Occurs in a range of habitats from rainforest to riparian woodlands. Recorded in the SCA, this represents a significant extension to its known range. This is the first recording west of the Great Dividing Range.	Little known information on biology or habitat requirements. Radio-tracking has provided evidence that the species roost in tree hollows or dense foliage, habitat retention is essential. Threats include; loss of old growth trees, predation by cats and loss of understorey habitat from too frequent fires.
Fawn-footed Melomys <i>Melomys cervinipes</i>	Regional Significance	Usually found in moist Eucalypt forests in coastal areas, it has been recorded on the dry rocky hillsides in the western section of the SCA. It is not known to occur anywhere else west of the Great Dividing range.	Predation by foxes and cats. Lack of knowledge about habitat requirements in this area.



MAP: TORRINGTON STATE CONSERVATION AREA AND LOCALITY

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