

NSW North Coast Weeds Advisory Committee
REGIONAL WEED MANAGEMENT PLAN

1.1 PLAN TITLE: Coastal weeds

1.1 PLAN PROPONENTS

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NSW North Coast Weeds Advisory Committee
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Date:

1.3 NAME OF PLANT

Botanical name

Gloriosa superba

Asparagus spp.

Ochna serrulata

Ipomoea spp.

Schefflera actinophylla

Senna spp.

Acetosa sagittata

Sphagneticola trilobata

Euphorbia cyathophora

Cenchrus echinatus

Weed Of National Significance: No

Common names

Glory lily, Gloriosa lily, Superb lily

Ground & climbing asparagus & Asparagus fern

Mickey mouse plant, Ochna

Common & purple morning glory & Mile-a-minute

Umbrella tree

Winter senna & Smooth senna

Turkey rhubarb

Singapore daisy

Painted spurge

Mossman river grass

1.4 PLAN PERIOD

Starting date: January 2005

Completion date: December 2009

1.5 AREA OF OPERATION:

Area of the North Coast Weeds Advisory Committee – Coastal LGAs from Nambucca to the Queensland border

1.6 AIM:

To reduce the impacts of coastal weeds on natural, cultural and recreational values.

1.7 OBJECTIVES:

1. Co-ordinate and plan management at a regional and local level by June 2005.
2. Increase awareness and involvement in management of coastal weeds over the life of the plan.
3. Implement control and regeneration programs in 50% of identified high priority areas by the end of the plan.

2.0 STAKEHOLDERS

2.1 Stakeholder Local Weed Control Authorities

Far North Coast Weeds, Clarence Valley Council, Coffs Harbour City Council, Bellingen Shire Council, Nambucca Shire Council.

2.2 Other Stakeholders

Tweed Shire Council, Byron Shire Council, Ballina Shire Council, Richmond Valley Shire Council, Department of Environment and Conservation (including the former National Parks and Wildlife Service and Environment Protection Authority), Department of Primary Industries (including the former NSW Agriculture, NSW State Forests and NSW Fisheries), Northern Rivers Catchment Management Authority, Department of Infrastructure, Planning and Natural Resources, NSW Department of Lands, Coastal Care Groups e.g Dunecare, Rail Infrastructure Corporation, Roads and Traffic Authority, Australian Association of Bush Regenerators, private land occupiers.

3.0 BACKGROUND AND JUSTIFICATION

Environmental weeds have invaded all coastal vegetation systems across the region. Both disturbed and undisturbed ecosystem types have been impacted on including dune and headland heathlands and grasslands, coastal woodlands, wetlands, forests and littoral rainforests – an endangered ecological community. The weeds also impact on human infrastructure, cultural assets and aesthetics. Continual maintenance of beach access tracks, coastal roads and parks is required to either prevent or reduce invasion and loss of use of these areas to environmental weeds.

The major impact of coastal weeds is their displacement and replacement of native plants to the extent that the resulting ecosystem is much simplified in structure and floristics. Habitat values for fauna are drastically altered.

The most widespread of these weed species is bitou bush, which infests over 90% of the region's coastline. Bitou bush is listed as a weed of national significance, a threatening process under the Threatened Species Conservation Act, and a W3 declared noxious weed throughout the region.

Following control of bitou bush, a number of other serious weeds can take its place. Glory lily, for example, can invade as broad a range of habitats as bitou bush and is harder to control. This plan has been prepared to reduce the spread and increase awareness and control of other high priority environmental weeds in the coastal zone. The plan is to be used in-conjunction with the Bitou Bush Regional Weed Management Plan and other weed and bush regeneration plans for the region.

The environmental weeds described in detail within this plan were selected due to:

- High ranking in the North Coast Environmental Weed Risk Assessment, undertaken in 2002 by the NSW North Coast Weeds Advisory Committee.
- Current rate of spread and distribution within the region, particularly following control of bitou bush.
- Current impacts and future threat to high conservation value lands and biodiversity in general, and;
- Difficulty of control.

The environmental weeds targeted for control at the local level will depend on the individual situation. The environmental weeds listed in this plan are the highest priority for control at the regional level, however, other environmental weeds or other declared noxious weeds such as lantana or broad leaf pepper tree may be the highest priority for control at some sites. Some species included in the plan have a widespread distribution whilst others are only isolated or scattered but have an invasive history in similar environments elsewhere.

3.1 Weed Biology/Ecology

3.1.1 Glory lily *Gloriosa superba*

Glory lily is a herb with annual climbing stems and perennial underground tubers. It is capable of growing prostrate over exposed dunes or as a scrambling vine up to 4m high in rainforest. New annual shoots appear in November-December, depending on the season.



The stemless lime green leaves of glory lily have a tendril at the tip. The wind-pollinated flowers, seen from October to May, have 6 large yellow, orange and red coloured petals. The number of flowers produced is in proportion to the size of underground tubers (Escher *et. al.* 1973, USDA 1995).

Large green capsules turn black and produce numerous bright orange to brown fruits from late summer to winter. Optimum germination rates are achieved with soil temperature at 20-25°C. The seed may be eaten and spread by a wide variety of fauna and has been suspected of poisoning wallabies. Establishment and expansion of infestations is aided by disturbance such as after fire and adjacent to tracks and trails.

Underground tuber networks form a mass of above ground stems belonging to a single plant. The tubers contain 9 alkaloid type substances including colchicine and gloriosine. The seeds are used in the treatment of gout and rheumatism. Glory lily is poisonous to humans and is responsible for 1000's of poisonings in Sri Lanka including 8 deaths. Studies reveal it has allelopathic potential (Harden 1993; BSRLG 2000; Csurhes and Edwards 1998, Coastcare 1998, Fernando and Fernando 1993).

3.1.2 *Asparagus* spp.

Five *Asparagus* species have naturalized in Australia. Of these, the three species listed below have caused the most negative impacts in the NSW north coast region. The three plants do not have leaves; instead narrow scale or fern-like "photosynthetic stems" called cladodes. The cladodes are arranged in clusters and are often accompanied by a sharp spine.

Ground asparagus *Asparagus aethiopicus*

Ground asparagus is a perennial shrub with numerous sprawling green stems growing 2-3m long, creating a thick carpet over the ground and other plants. The stems have axillary spines. It has both tuberous and fibrous roots.



Two to five narrow (2-3mm wide) cladodes are produced per axil. They are flattened and pointed. Small white to pinkish flowers are produced in spring and summer.

Small pale green berries ripen to bright red in summer and autumn. They are readily eaten and spread by birds and other animals.

Asparagus fern *Asparagus africanus*

A perennial sub-shrub or climber with 8-12m long stems. Older stems can have spines to 10mm long. It is capable of growing along the ground, smothering shrubs / regeneration and growing up trees.



The spirally arranged branches have spines at the point where clusters of 7-12 very narrow (0.5mm) cladodes are produced.

Small (5-6mm) orange berries are produced in summer and are readily bird-dispersed. The plant has a fibrous root system.

Climbing asparagus *Asparagus plumosus*

A vine with wiry climbing stems to at least 5m long. Recurved spines on the stems grow to 5mm long. Distinguished from the other two species by the final branches and leaf-like stems (cladodes) growing along one plane.



The plant has 8-15 very narrow (0.5mm) cladodes per axil. Small greenish white flowers are mainly produced in spring and summer. The small black bird-dispersed berries are usually produced in autumn and early winter. The plant has both a fibrous and tuberous root system.

3.1.3 Mickey mouse plant *Ochna serrulata*

A shrub growing 2-3m tall with numerous corky spots and lines on the brown bark. It grows in a range of situations and can form dense thickets.

The leaves are stiff, oblong in shape, 2-6cm long and have numerous small teeth. The plant produces yellow flowers in late winter to spring and round black fruits in late spring and early summer. The fruits are deeply embedded on swollen red receptacles.



3.1.4 Morning glory *Ipomoea* spp.

Ipomoea spp. are annual or perennial herbs with trailing or twining stems. They have characteristic large funnel or trumpet-shaped flowers that are usually purple, pink or white. Several *Ipomoea* spp. have naturalised and are causing substantial negative impacts in the region, however, a number of *Ipomoea* spp. are native to the region.

In addition to the species listed below, other *Ipomoea* spp. could also pose a threat to the NSW north coast coastal zone such as moonflower *Ipomoea alba* (with white trumpet-like flowers). Substantial infestations of the plant are found in the Clarence catchment, e.g Susan Island. *Ipomoea quamoclit* (brilliant red or occasionally white colour flowers) is causing problems in Queensland, Northern Territory and Western Australia.

Mile a minute *Ipomoea cairica*

A perennial herb with trailing and twining stems capable of growing to the tops of trees and forming vine thickets near the ground. One of the plant's common names is five-leaf morning glory, referring to the five-lobed leaves (can be up to 7 lobes).



The stems of the plant are purplish when young; green and wavy when mature and with a milky latex. The large (3.5-6cm) funnel-shaped flowers are violet to purplish violet in colour with a darker coloured throat. The large brown capsules, produced all year, split into 4 valves and produce large hairy seeds.

Blue morning glory *Ipomoea indica*

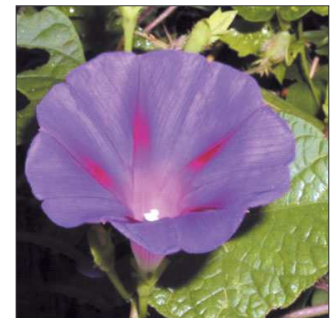
A perennial herb with twining stems, blue morning glory is capable of growing to the tops of trees and forming dense thickets near the ground; smothering other plants. The broad heart-shaped leaves (4-17cm long) are sometimes 3-5 lobed. They are hairy on both sides.



Young stems are purplish and hairy. Mature stems are creamy-grey and exude white latex. The funnel-shaped flowers, produced mainly in spring-autumn, are violet blue in colour, with some lighter coloured bands and a darker coloured throat. Brown capsules can be produced throughout the year, however, fruit has not been known to be set in Australia. Blue morning glory can look similar to the native species *Ipomoea brasiliensis* - it has tough leaves with a notched tip.

Purple morning glory *Ipomoea purpurea*

Annual herb with twinning branches. The large (2-10cm long and wide) green leaves are either heart-shaped or 3-lobed. The long funnel-shaped flowers are white, purplish violet or violet blue in colour and produced throughout the year. The capsule (8-10mm diameter) splits into 3 to reveal the small seeds.

**3.1.5 Umbrella tree *Schefflera actinophylla***

Native to north Queensland, umbrella tree is single or multi-stemmed, and generally grows to 10m tall. It is capable of growing either from the ground or as an epiphyte.



The large leaves are palmately compound; with 7-16 glossy oblong-shaped leaflets 8-30cm long. Stems are creamy grey and woody. The red flowers, often clustered towards the ends of branches, are produced in autumn. The readily bird-dispersed drupes are 3-5mm long, ribbed, dark red in colour and produced in winter. It has an extremely invasive tap root system.

3.1.6 *Senna* spp.**Winter senna *Senna pendula* var. *glabrata***

A spreading or scrambling shrub to 3m tall, it favours a variety of soils and has invaded many areas where bitou bush has been controlled. It has compound leaves (4-8cm long) with 3-6 pairs of leaflets per leaf. The leaflets are rounded with a blunt point and a prominent lighter coloured mid-vein. The hollow stems are dark brown; drying to yellow.



Bright yellow “pea-type” flowers are produced throughout the year but particularly in autumn. Long (10-14cm) brown or straw coloured “pea-type” pods containing hard seeds are produced in autumn. The seeds are readily dispersed by rodents, ants and birds and can remain viable for many years. It has a long tap root.

Smooth senna *Senna septemtrionalis* (previously *Senna X floribunda*)

A 1-3m tall shrub. It has compound leaves 6-8cm long that have 3-5 pairs of leaflets. The leaflets are pointed, 4.5-7cm long, and have gold translucent edges. Mature stems are dark brown but yellow when scraped.



Bright yellow “pea-like” flowers are produced from spring to autumn. Dry straw-coloured cylindrical pods, 7-8cm long, are produced from summer to winter. Germination can be somewhat sporadic but seeds can remain viable for many years. It has both a tap and lateral root system.

3.1.7 Turkey rhubarb *Acetosa sagittata*

A perennial climber with stems growing to 3m or more long. Leaves are spear-shaped, 6-10cm long and 3-5cm wide.

Flowers are small, green or purplish and produced from spring to autumn in dispersed branches at the end of stems.

Fruits are straw to purplish coloured winged capsules. Within each capsule 3-sided nuts are produced about 3 mm long and 1.7 mm wide.

The plant has thick tubers to 10 cm long and is spread by seed, movement of tubers and laterally by rhizomes.



It is diuretic, anti-inflammatory, anti-bacterial and has been used extensively to relieve constipation.

3.1.8 Singapore daisy *Sphagneticola trilobata*

A creeping mat-forming perennial herb growing 10-70cm tall. Its trailing stems grow to 2m long and can take root where the leaves are produced (Csurhes and Edwards 1998).

The leaves are usually fleshy, 3-lobed, irregularly toothed, sparsely hairy and 3-11cm long by 2.5-8cm wide (Csurhes and Edwards 1998 and Weeds Australia 2004).



Flowers are bright yellow, about 2cm across, and grow on stalks 3-14cm long. The flower heads have 4-14 petal-like ray florets (Csurhes and Edwards 1998 and Weeds Australia 2004).



3.1.9 Painted spurge *Euphorbia cyathophora*

Painted spurge is an erect herb growing to 80cm tall. It has green stems. Leaves are mainly 2-4 lobed and 4-7cm long by 1.5-3cm wide.

The flowers, seen most of the year, are dull red in colour and irregularly clustered at the ends of stems and branches. The fruits are small, segmented capsules (Coastcare 1998).



3.1.10 Mossman river grass *Cenchrus echinatus*

An annual grass with prostrate or erect stems forming loose tussocks - 60-90cm high in mature plants (Qld NRME 2004 and Parsons and Cuthbertson 2001).

The leaves are pale green, flat and stiff, tapering towards the tip, and 5-25cm long by 3-12mm wide. There are a few scattered hairs on the leaf margin at the base of the leaf (Qld NRME 2004, Parsons and Cuthbertson 2001).



Seed heads are spike-like clusters of 12 to 14 burrs. Each burr, 0.5-1cm across, is a ball of stout, broad, spiny bristles joined together at the base (Qld NRME 2004).

3.2 Current distribution

Environmental weeds are widespread along the coastal zone and threaten important ecological communities such as littoral rainforest, grassy headlands and wetlands.

Most weed control programs in the coastal zone are focused on bitou bush. Bitou bush infests over 90% of the coastline and is present in a broad range of habitats. When bitou bush control programs occur, many of the species in this plan and others can invade the area. Other common sites where environmental weeds invade in the coastal zone are roadsides, disturbed lands and adjoining urban areas and forests.

Table 1: Summary of the distribution of each priority weed species per LGA.

Key: I = Isolated, S = Scattered, W = Widespread

Twe = Tweed, Byr = Byron, Bal = Ballina, Ric = Richmond Valley, Cla = Clarence, Cof = Coffs Harbour, Bel = Bellingen, Nam = Nambucca

LGA	WEED SPECIES														
	<i>Gloriosa superba</i>	<i>Asparagus aethiopicus</i>	<i>Asparagus africanus</i>	<i>Asparagus plumosus</i>	<i>Ochna serrulata</i>	<i>Schefflera actinophylla</i>	<i>Ipomoea cairica</i>	<i>Ipomoea indica</i>	<i>Ipomoea purpurea</i>	<i>Senna pendula var. glabrata</i>	<i>Senna septentrionalis</i>	<i>Acetosa sagittata</i>	<i>Sphagneticola trilobata</i>	<i>Euphorbia cyathophora</i>	<i>Cenchrus echinatus</i>
Twe	S	S-W	I	I	I-S	S-W	S	S	S	S	S	I	S	I-S	I
Byr	S	S	I	S	I-S	S-W	S	S	S	S	S	I-S	S	I-S	I-S
Bal	S	S	I	S	I-S	S-W	S	S	S	S	I-S	I-S	S	I-S	I
Ric	I-S	I	I	I	I	I-S	I-S	I-S	I	S	I-S	I-S	S	I-S	I
Cla	I-S	I-S	I-S	I	I-S	I	I-S	I-S	I-S	S-W	I-S	I-S	S	I-S	I-S
Cof	W	S	I	I	S-W	S-W	S	S	S	W	I-S	I	S	I-S	I
Bel	S-W	I	I	I	I	I	S	S	S	S	I-S	I	I-S	I	I
Nam	S-W	I	I	I	I	I	S	S	S	S	I-S	I	I-S	I	I

3.2.1 Glory lily *Gloriosa superba*

Glory lily originated from Africa and Southern Asia and was introduced to Australia as an ornamental plant.

In NSW the plant occurs in coastal environments from North Haven to the Queensland border. Only isolated infestations occur between Red Rock and Ballina. In Coffs Harbour LGA all glory lily infestations have received some treatment. Severe infestations of 100 stems / m² have been recorded in Bongil Bongil NP south of Coffs Harbour. The plant has a scattered distribution between Bongil Bongil NP and Scotts Head. The endangered ecological community littoral rainforest is threatened by competition from glory lily.

3.2.2 *Asparagus* spp.

The *Asparagus* species listed in this plan originated from South Africa. All of the species were introduced to Australia as ornamental plants in the late 19th century. Within Australia *A. aethiopicus* is the most widespread; forming a dense groundcover in many coastal dunes and forests. *A. aethiopicus* and *A. plumosus* are both serious coastal weeds, particularly near urban centres, along the south Queensland and northern New South Wales coastline as well as the NSW South West Slopes, Lord Howe Island and in South Australia. Twenty five percent of the rainforest in the World Heritage listed Iluka Nature Reserve was heavily infested before a control program commenced. *A. africanus* is a serious weed in parts of the southern Queensland and northern NSW coastline.

All three species favour warm humid conditions with 500mm to 1500mm rainfall. They prefer nutrient rich sandy or skeletal soils but will grow in a variety of situations from coastal sand dunes to open woodland and rainforest. All three species grow well in shade.

3.2.3 Mickey mouse plant *Ochna serrulata*

Mickey mouse plant is native to Guinea in West Africa. It was introduced to Australia as an ornamental and has naturalised in dry sclerophyll forest and riparian vegetation throughout most of coastal south east Queensland and from Sydney north along the coastline; particularly near urban areas. It tolerates a variety of soils and will grow in deep shade.

Within the region a heavy infestation (~0.5 ha) at Red Cliff near Brooms Head has been the target of control programs by NPWS since the early 1990's. Scattered infestations occur near all urban and most town centres in the region. At a site near Lennox Head in 1999, 442 plants were recorded in a 1m X 1.5m area (Apps, pers. comm.).

3.2.4 *Ipomoea* spp.

The three *Ipomoea* species originate from tropical regions; *I. cairica* from Africa and Asia; *I. indica* and *I. purpurea* from North and South America. All three species grow in a wide variety of soils and situations, however, they particularly favour nutrient enriched disturbed sites around urban areas or on forest edges.

Scattered infestations of all three species are found near urban centres and many towns within the region. *I. cairica* is the most common of the species in the coastal zone – particularly in the lower Clarence catchment. The distribution of *I. indica* has increased markedly in recent years, with occurrences being found in many remote and semi-remote locations.

3.2.5 Umbrella tree *Schefflera actinophylla*

Umbrella tree is native to north Queensland, some South Pacific Islands and New Guinea. It has been planted extensively in southern and eastern Australia and is now naturalising north of Sydney. It is widespread in disturbed rainforest around urban centres such as Coffs Harbour, Ballina, Lismore, Byron Bay and throughout Tweed LGA. It is a major weed in south east Queensland. It favours a variety of soils and habitats including deep shade. It can grow as an epiphyte on rainforest trees.

3.2.6 *Senna* spp.

Senna pendula var. *glabrata* originated from South America. *Senna septemtrionalis* originated from Central America (Mexico). Both species favour a wide variety of soils and habitats, from disturbed rainforests, wet sclerophyll forests, open sand dunes, roadsides and wastelands.

Both species were introduced to Australia as ornamental plants. *Senna pendula* var. *glabrata* has now naturalised in southern Queensland and in NSW in coastal districts, the western slopes and on Lord Howe Island. *Senna septemtrionalis* has naturalised in southern Queensland and in NSW in coastal districts, along the Central Tablelands and on Lord Howe Island.

Within the region both species are common near urban and town centres. *S. pendula* var. *glabrata* is a particularly common invader following control of bitou bush; especially in hind dune vegetation and forest edges. *S. septemtrionalis* occurs mostly in disturbed bushland and roadsides.

3.2.7 Turkey rhubarb *Acetosa sagittata*

Turkey rhubarb originated in South Africa and is now a significant weed in a number of areas including New Zealand, U.S.A and in South America. In Australia it is a problem weed in Queensland, Northern Territory, Victoria, Tasmania and Western Australia. In NSW it has naturalised in various locations along the north, central and south coast's.

Within the north coast region turkey rhubarb has a scattered distribution from Ballina Shire north to the Queensland border and from Coffs Harbour to Nambucca Shire. Isolated to scattered infestations are found in the Clarence catchment. The majority of infestations are in the coastal zone. Although it is capable of growing in a range of environments its tubers grow particularly well in sandy soils. It often infests waste areas or disturbed sites surrounding urban areas.

3.2.8 Singapore daisy *Sphagneticola trilobata*

Singapore daisy is native to the tropics of Central America. It is listed as a weed in Trinidad, Puerto Rico, the Dominican Republic, Jamaica, Panama, Surinam, the Hawaiian Islands, New Zealand and other parts of the Pacific. It is listed in the United States Federal Noxious Weed Act (Csurhes and Edwards, 1998).

Singapore daisy favours open areas with well drained, moist soil but can tolerate dry periods. It is common along the edge of rainforests, on roadsides and other disturbed areas. It has the ability to colonise new places by spreading from discarded stem cuttings (Csurhes and Edwards, 1998).

3.2.9 Painted spurge *Euphorbia cyathophora*

Painted spurge is native to the Americas – specifically Argentina, Chile, Bolivia, Columbia, Ecuador, the Caribbean, Mesoamerica (such as Costa Rica and Guatemala), Mexico and southern United States.

Painted spurge is a problem weed in several countries / areas of the world including Micronesia, Thailand, mainland United States, Hawaii, Fiji and other Pacific Islands.

Within Australia painted spurge is a weed in Queensland, Western Australia, Northern Territory and the NSW north coast coastline. It prefers sandy soils; particularly in disturbed sites. On the NSW north coast painted spurge is particularly a problem north of Coffs Harbour in disturbed hind dune areas.

3.2.10 Mossman river grass *Cenchrus echinatus*

Mossman river grass is native to tropical America, extending from southern United States through the Caribbean region and central America to Columbia, Brazil, Argentina and Chile. It is reported as a weed in tropical Africa, Madagascar, India, Israel and countries bordering the western Pacific Ocean (Parsons and Cuthbertson 2001).

Believed to be introduced to Australia in the 1860s, it is now a serious weed in many inland parts of Queensland, in the south and north of the Northern Territory, Western Australia (particularly the West Kimberleys) and at Lake Boga in Victoria (Parsons and Cuthbertson 2001).

Within NSW mossman river grass is a significant coastal weed in the north coast region; particularly north of the Clarence coastline. It prefers sandy or other light soils. It occurs as

a weed in cultivated fields, pastures, roadsides, lawns, town pathways, river sands and beach margins (Parsons and Cuthbertson 2001).

3.3 Null hypothesis

Pest species are recognised as the second biggest threat to biodiversity after land clearing. The threat that bitou bush poses to biodiversity is recognised through its listing as a “threatening process” on the *Threatened Species Conservation Act 1995* and as one of 20 Weeds of National Significance. Increased resources are now being targeted to reducing the impacts of bitou bush. If other serious environmental weeds were to simply take its place, the impacts on threatened species and significant ecosystems may not be reduced and hence the resources will have been wasted.

If priority environmental weeds in the coastal environment are not controlled they will continue to spread and lead to further impacts on biodiversity, recreation, tourism and physical infrastructure. The weed species covered in this regional plan have been selected due to their high ranking in the NSW north coast environmental weeds risk assessment. The assessment ranked weeds according to their invasiveness, environmental impacts, potential distribution and difficulty of control.

All of the species covered by the plan are already having significant negative impacts in at least a number of locations within the region. All of the species are capable of growing in a range of environments. Most of the species can grow well in shade and pristine environments. Most of the species are difficult to control.

Control programs utilising best management practices are now being undertaken on these priority environmental weeds. These need to be fully supported and expanded. Long term funding is crucial to the success of these programs and the protection of coastal biodiversity.

4.0 LEGISLATIVE AND REGULATORY SITUATION

4.1 Current Declaration

None of the weeds covered by this regional plan are currently declared noxious in the region. A number of the weeds are declared noxious in the greater Sydney region. *Gloriosa superba* is declared noxious on Lord Howe Island. *Asparagus aethiopicus* is declared noxious on Lord Howe Island and 13 other LGAs, *A. plumosus* is declared noxious in a total of 13 LGAs, *Ochna serrulata* is declared noxious on Lord Howe Island and an additional 9 LGAs, *Ipomoea cairica* and *I. indica* are both declared in 9 LGAs and *Senna pendula* var. *glabrata* is declared in 3 LGAs.

4.2 Declaration Changes

No change to declaration is expected.

4.3 Enforcement Strategy

As no declaration is being sought for the weeds, control programs cannot be enforced.

5.0 CONSIDERATIONS and OPPORTUNITIES

5.1 Opportunities to be exploited

Bitou bush control programs in the region are relatively well coordinated following the implementation of the NSW and north coast bitou bush strategies. The framework established during this process will be used to share information and coordinate on-ground control programs for other weeds growing in the same environment. The meetings and quarterly newsletters of the NSW North Coast Weeds Advisory Committee will also be used to help coordinate control activities.

The Draft NSW Threat Abatement Plan for “Invasion of native plant communities by bitou bush / boneseed” prioritised the native species, populations and ecological communities at greatest risk from bitou bush and where management programs are likely to have the most significant outcome for biodiversity (DEC 2004). Twenty eight of the top 60 priority sites in the state are located within the NCWAC region. Coordinated control programs will be continued / initiated at these sites. The sites are therefore also priority locations for control of other important environmental weeds in the coastal zone.

As most stakeholders have been controlling bitou bush in priority areas for a number of years they generally have a good knowledge of the areas most under threat by environmental weeds. In some of these locations all priority environmental weeds have been targeted for control. Existing projects need to be continued and expanded.

Some local weed control authorities and other stakeholders do not have experience at controlling all of the weed species listed in this plan. It is important to ensure that information and expertise is obtained from other stakeholders such as local bush regenerators, Dunecare groups and staff from DEC, Qld NRME and NSW DPI. More formalised training of key staff may be required. A number of bush regeneration and natural resource management courses are available through local TAFEs, DPI and elsewhere.

Coastal weed management in the region generally has excellent community support, with many dunecare groups working on a variety of weed projects. Government-based stakeholders need to encourage, promote and work with these groups to expand their work.

Resources for control of priority environmental weeds in the coastal zone are now available through a range of sources including the Northern Rivers Catchment Management Authority, state noxious weeds funding for control of bitou bush and from stakeholders such as local Councils, DEC, Department of Lands and through community group funding such as Environmental Trust and Envirofund.

Control of priority environmental weeds can be promoted through the NCWAC’s Bushland Friendly Nursery Scheme and associated web site. Promotion of control techniques will also greatly assist the wider community to be involved.

5.2 Industry Sectors

Traditional industry sources for support and assistance do not exist due to the non-commercial nature of infestations and the lack of impacts on agricultural production. There may, however, be value in approaching the tourism, beachwear, coastal development,

coastal use (surfing / fishing) product industries to provide sponsorship for activities in the program.

In the Tweed LGA, resources have been provided for control of coastal weeds by a developer. In the Richmond Valley, resources have been provided by Australian Department of Defence for control on their lands. These projects could be further encouraged and supported to ensure that appropriate methods are used, follow up control of all priority weeds occurs and that it is coordinated with activities from other stakeholders.

The Coffs Harbour City Council environmental levy has enabled significant resources to be targeted to control most priority coastal weeds in the city. This will continue to be promoted in the region to encourage other local Councils to implement environmental or sustainability levies of ratepayers.

In recent years Greencorp, Work for the Dole, Conservation Volunteers Australia (formerly A.T.C.V) and periodic detention service have been used to assist coastal weed control activities and these can continue to be expanded.

5.3 Ecological

Priority areas for control of coastal environmental weeds are assets such as littoral rainforest, grassy headlands and heath, coastal wetlands, visually prominent areas, areas adjacent to current work locations and areas where coastal weeds are impacting on infrastructure and public use areas. A number of priority locations for control of bitou bush (and hence priority environmental weeds) within the region have been listed in the Draft NSW Threat Abatement Plan "Invasion of native plant communities by bitou bush / boneseed" (DEC 2004).



Middle and Iluka Bluff, Bundjalung National Park and Iluka Nature Reserve, north of Clarence mouth.

Bitou bush (yellow flowers seen) and other priority coastal weeds threaten the World Heritage listed Iluka Nature Reserve and the endangered ecological community littoral rainforest.

A bush regeneration approach will be required for control of most of the weed species in most situations. This will generally involve targeting the most environmentally significant areas or other high priority locations first. The techniques used should aim to reduce impacts on native species so that they are encouraged to grow and take the weed's place.

For weeds such as umbrella tree where many thousands of seeds can be produced from a single plant each year, the largest trees should be given priority to reduce seed dispersal to other areas from birds and flying foxes.

In most situations planting will not be required as control will target significant areas where good native regeneration is already present. Planting of appropriate local native species may be required if the site is degraded but supports threatened species, where there are gaps in the native vegetation cover and / or there is good community support.

Biological control research of the weeds included in this plan have not been undertaken in Australia. Some preliminary research of *Asparagus aethiopicus* has been undertaken. In South Africa the species is attacked by a chalcid wasp and a moth larva. A rust fungus severely damages the fruit. Leaves are severely damaged by a thrip and the larvae of a geometrid wasp. Stems are galled by two chalcid species (Parsons and Cuthbertson 2001).

5.4 Species Management

The techniques used to control coastal weeds will depend on the individual situation, the individual weed species, the native species present, the resources available and other factors such as topography, access and experience of the weed controller.

A range of techniques will be required to control the weeds listed in this plan. Some of these techniques will be significantly more time consuming than what may have been previously used on environmental weeds in that part of the coastal zone, such as where only aerial spraying of bitou bush has occurred. The table at the end of this section summarises the best time to control priority coastal weeds.

NCWAC has produced regional Bitou Bush Management Strategies that outline a framework for improved management of coastal weeds within the region. Implementation of the strategies has been greatly improved through the formation of a regional Bitou Bush Taskforce comprising key stakeholders.

Control of backyard infestations of the weeds will be encouraged through media promotions, signage at local shops near priority areas for control and at field days.

Preliminary mapping of some of the priority coastal weeds has been undertaken by member organizations of the NCWAC and the wider community. The mapping has been digitised and entered onto GIS. It now needs to be refined with further ground-truthing at the local level.

Detailed control information for each priority weed species is listed below. A summary is included at the end of this section.

IMPORTANT: Users of herbicides (and other agricultural or veterinary chemical products) must always read the label and any permit before using the product, and strictly comply with the directions on the label and conditions of any permit. Users are not absolved from compliance with the directions on the label or conditions of the permit by reason of any statement made or omitted to be made in this publication.

Glory lily is one of the most difficult coastal weeds to control. The most effective control in the region has been achieved using a foliar spray application in late November or December (depending on the season) when the new annual stems first appear. A follow up application in February or March (depending on the timing of summer / autumn rains which encourage growth) has also proved effective.

Some successful programs within the region have used 1 part glyphosate to 75 water plus 1g per 100L of metsulfuron methyl and addition of a wetting agent. Qld NRME have had success controlling glory lily in pot plants using basal bark application of Starane® and diesel. Whichever method is used, regular follow up control is needed. More research is still required comparing methods used in the region for several years with others being trialled by Qld NRME and NSW DPI.

Asparagus species are generally best controlled using the “crowning” technique where the above ground part of the plant is cut from the root system and hung up off the ground. Tubers can be painted with glyphosate. Runners near the ground can be gathered up and their main root systems removed. Regrowth needs to be controlled whilst it is actively growing (preferably between flowering and fruiting) with such techniques as foliar spraying with glyphosate (1 part glyphosate to 75 parts water) or metsulfuron methyl (1-2g in 10L of water).

Mickey mouse plant can be extremely difficult to control. It's long tap root is screw shaped and generally breaks off when hand pulled. Permits are available for control with glyphosate by foliar spraying (1 part glyphosate in 100 parts water) or cut stump or stem injection (1 part glyphosate to 1.5 parts water) when actively growing. A number of other techniques have been trialled. In Queensland permits are available for basal bark application of starane200® at the rate of 35mL starane200® to 1L of diesel. Control techniques require further refinement and trials within the region. More research is required, and appropriate permits sought, for diesel-based control techniques for the species.

Ipomoea species growing near and along the ground are often controlled by rolling up runners and hand pulling each root system. Regrowth can be foliar sprayed - permits are available to spot spray with glyphosate (1 part glyphosate to 100 parts water). Twining stems can also be controlled under permit by scraping back the stem and painting 1 part glyphosate to 1.5 parts water. Regular follow up is required.

Permits are available for the control of **umbrella trees**, *Senna pendula* var. *glabrata* and *Senna septemtrionalis* by either stem injection or cut stump application of glyphosate (1 part glyphosate to 1.5 parts water). When using cut stump, exposed roots or stems are generally also scraped and painted with the glyphosate mix. For *Senna* spp. seed heads are bagged and removed from the site as they could still germinate. Cut stems of umbrella trees can re-sprout when left on the ground. Seedlings of the three species are easily hand-pulled although the large numbers of them can make it time consuming.

Turkey rhubarb can be difficult to control due to its many tubers that can be hard to locate. Although time consuming, the most commonly used control technique involves manually digging out tubers. Mixed results have been found using glyphosate. Glyphosate (360g/L) is registered for control of the plant by foliar spraying with 1L glyphosate in 100L of water. Permit 4169 allows control of the plant by applying undiluted glyphosate through a stem scrape application.

Singapore daisy can be hand-pulled, however, great care must be taken to ensure all of the plant and each root system is removed otherwise it will regrow – roots can establish at each node. Permits are available for control of singapore daisy using glyphosate. Plants can be foliar sprayed at a rate of 1 part to 100 parts water and the addition of the surfactant Li700. Big Scrub Rainforest Landcare Group also recommend the use of

glyphosate at a rate of 200ml / 10L plus metsulfuron methyl at a rate of 1.5grams / 10L plus 2ml/L of Agral wetting agent (Big Scrub Rainforest Landcare Group 2000).

Painted spurge can be easily hand-pulled. This is quite effective for small infestations, however, it can be time consuming in larger infestations. Big Scrub Rainforest Landcare Group recommend handpulling or control using glyphosate at a rate of 100ml / 10L plus Li700 at a rate of 20ml / 10L (Big Scrub Rainforest Landcare Group 2000).

The most effective control method for **mossman river grass** is to kill young plants before they set seed. This can be done by cultivation, pulling by hand, burning off with heat by flame throwers or steam jets, or by spraying with herbicide (Qld NRME 2004). Permits are available for control of the weed in Queensland using a number of herbicides, however, permits for its control in NSW are currently being prepared. In Queensland glyphosate can be used for control using a range of techniques such as knapsack or rope-wick applicator. The herbicides Dichlobenil and Fluazifop are also available for controlling the weed in Queensland.

Table 2: Summary of the best time to control priority coastal weeds using the most commonly used control techniques (detailed on the following pages)

	January	February	March	April	May	June	July	August	September	October	November	December
Glory lily		X	/								X	X
<i>A. aethiopicus</i>	/	X	X	X	/							
<i>A. africanus</i>	/	X	X	X	/							
<i>A. plumosus</i>	/	X	X	X	X	/						
Mickey mouse	X	X							X	X	X	X
<i>I. cairica</i>	X	X	X	X	X	/	/	/	X	X	X	X
<i>I. indica</i>	X	X	X	X	X	/	/	/	X	X	X	X
<i>I. purpurea</i>	X	X	X	X	X	/	/	/	X	X	X	X
Umbrella tree	X	X	X	X	X	/	/	/	/	X	X	X
Smooth senna	X	X	X	X	X	X	X	X	X	X	X	X
Winter senna	X	X	X	X	X	X	X	X	X	X	X	X
Turkey rhubarb	X	X	X	X	X	X	X	X	X	X	X	X
Singapore daisy	X	X	X	X	X	/	/	/	X	X	X	X
Painted spurge	X	X	X	X	X	X	X	X	X	X	X	X
Mossman River grass	X	X	X	X	X	/	/	/	X	X	X	X

5.5 Community

Fortunately, there is substantial community interest in bitou bush management as evidenced by the many volunteer Dunecare groups along the coastline. Awareness-raising activities are required to encourage the identification and control of other priority weeds growing in the coastal environment.

The involvement of Dunecare groups has limitations in that each group varies in its enthusiasm, knowledge and abilities. For some groups, consistent effort is difficult to

maintain from year to year. There are limits to the size and types of areas that volunteers can reasonably be expected to work on.

In recent years local weed control authorities (LCAs) and other organizations have been working more closely with community groups. Activities include undertaking initial control works to assist in new work areas, purchasing native species for planting by the groups and advising about control techniques. Each LCA area has a bitou bush contact person with all key documents / articles / reports relating to management of bitou bush. Additional information relating to other coastal weeds will be required by them. In some LCA areas coordination has been assisted through the formation of Local Working Groups or Landcare “group of groups”.

5.6 Extension and Education

The concentration of population in coastal areas and the interest in and use of the coastal environment presents a substantial opportunity to gain an extension of community support for the control of coastal weeds.

Existing extension activities have included public meetings to discuss proposed aerial spraying of bitou bush; workshops for local communities about weed control, plant identification and vegetation management and field days at various locations to inspect control activities. These have generally been implemented by LCAs, Community Capacity Building / Landcare Coordinators and a number of other stakeholders. Future extension activities will aim to broaden the knowledge and awareness of coastal weeds within the community.

5.7 Links to other Strategies

The NSW North Coast Weeds Strategy is the umbrella document for all other weed policies and plans in the region. It has helped establish a framework for coordinated strategic weed control programs in the region and encourages control of all priority weeds commencing in high priority locations.

This plan is closely linked to the North Coast Bitou Bush Management Strategies and the Bitou Bush Regional Weed Management Plan. The Plan is also closely linked to the Draft NSW Threat Abatement Plan “Invasion of native plant communities by bitou bush / boneseed”, the NSW Bitou Bush Strategy, the National Bitou Bush / Boneseed Strategy and the NSW Biodiversity Strategy. Local Bitou Bush Strategies linked to the regional Strategy have now been produced for a number of LGAs in the region and adjoining areas including Tweed, Bellingen, Nambucca and Kempsey Shires.



It is important that regional priority environmental weeds are discussed with key DEC staff to ensure that they are considered in any future Threat Abatement Plans for weeds.

The top 3 priority locations for management listed in the Draft Bitou Bush Threat Abatement Plan are Zieria prostrata sites, recorded on headlands north of Coffs Harbour.

5.8 Barriers and contingencies

Several contingencies may impact on the implementation of this plan such as drought and lack of funding. Despite being contingencies, efforts have been made to address these issues through the action plan.

Barriers to be overcome whilst implementing control of coastal weeds include:

- A. The majority of noxious weed control has historically focused on individual weed species rather than control of all problem “declared” and “non-declared” weeds using more of a holistic or landscape approach. There may be a culture in some local weed control authority staff and other stakeholders that is resistant to this different approach. Discussions and circulation of information by NCWAC and the Coastal Weeds Taskforce will help address this issue.
- B. Related to point A; many local noxious weed officers and other stakeholders undertaking “species-specific” control programs would pride themselves in controlling every plant they see of a particular noxious weed. The approach recommended in this plan is to focus more on high priority areas only, and move out from there when success (and appropriate maintenance levels) are being achieved. The NCWAC and the Coastal Weeds Taskforce will help promote the need for strategic holistic control programs.
- C. There are inadequate resources to control currently declared noxious weeds. Expanding the number of species to be controlled may reduce control of currently declared species. This problem is to be partly addressed through increased resources from other sources such as the CMA. The fact that impacts from the original noxious weed are often not reduced if other weeds are left uncontrolled will also be strongly emphasised by the NCWAC and Coastal Weeds Taskforce.
- D. There may be a lack of awareness and experience by some stakeholders in the use of weed control techniques such as scrape and paint, cut scrape and paint and stem injection. Some stakeholders may currently undertake most control programs with a vehicle-based Quickspray® unit and will have little knowledge of bush regeneration approaches. Some education will be provided through the NCWAC and Coastal Weeds Taskforce, however, more formal education and training will be required by some stakeholders.
- E. As bitou bush has historically been the focus of coastal weed control programs, most control programs have been undertaken in winter only. This plan recommends control programs at a number of times through the year to enable all problem weeds to be controlled at the appropriate times. This will require a new approach and increased resources. Adjustments can be made so that these control programs can be coordinated with other control programs occurring at that time of year.
- F. In some areas there have been few field inspections undertaken before bitou bush control programs such as aerial spraying occur. This plan recommends that field inspections and monitoring be undertaken before control to reduce expansion of problem weed infestations already present at the site.
- G. There has been a lack of coordination with regards to control of priority coastal weeds other than bitou bush. The NCWAC and Coastal Weeds Taskforce will aim to address this issue.

H. Within the general community there is a lack of awareness of many coastal weeds other than bitou bush. Some of the weed species such as umbrella trees, mickey mouse plant and *Asparagus* species are widely planted in backyards. Many of those people will not be aware of the threat caused to the environment by the species. Education programs will focus on increasing awareness of the threat caused by the species, knowledge of identification and control techniques and local success stories. Education programs will need to focus on both the regional level and local level where examples of local problems can be seen / promoted. Promotion of the North Coast Bushland Friendly Nursery Scheme will assist in education about problem weeds and their alternatives.

6.0 ACTION PLAN

Abbreviations listed at end.

The key stakeholder responsible for implementation of the action is listed in bold.

Objective 1: Co-ordinate and plan management at a regional and local level by June 2005.		
Action	Performance indicator	Who
1.1 Establish the north coast coastal weeds taskforce, comprising key stakeholders.	<ul style="list-style-type: none"> ▪ Taskforce established by December 2004 ▪ Taskforce meets 3 times / year until December 2005 ▪ Taskforce meets twice / year after January 2005 	Planning Officer , NCWAC, Coastal Weeds Taskforce, NCWAC community members
1.2 Produce then update distribution maps of priority coastal weeds annually	<ul style="list-style-type: none"> ▪ Mud maps produced for priority weeds by February 2005 ▪ 1:100,000 scale maps produced by June 2005 ▪ Maps updated annually 	Planning Officer , NCWAC, Coastal Weeds Taskforce, DEC, LCAs, DoL, Councils, CMA, MNCWAC, Coastal Care groups, community
1.3 Identify high priority locations for control and regeneration programs	<ul style="list-style-type: none"> ▪ High, moderate and low priority locations identified by October 2005 	Coastal Weeds Taskforce , NCWAC, Planning Officer, DEC, LCAs, DPI, DoL, Councils, CMA, MNCWAC, Landcare coordinators, Coastal Care groups, community
1.4 Establish best practices for management of coastal weed species and associated environments	<ul style="list-style-type: none"> ▪ Best practices established for each weed / environment by October 2005 	Coastal Weeds Taskforce , NCWAC, DPI, Planning Officer, Qld NRME, LCAs, CMA, DEC, DoL, Councils, Landcare coordinators, Community groups and individuals
1.5 Develop standardised monitoring practices for control programs in the region	<ul style="list-style-type: none"> ▪ Best practice monitoring procedures established by June 2005 	NCWAC , Coastal Weeds Taskforce, Planning Officer, LCAs, DEC, CMA, DPI, Councils, Qld NRME, MNCWAC, DoL, Landcare coordinators, Coastal Care groups, community

1.6 Seek funding through various sources to implement ongoing control programs	<ul style="list-style-type: none"> Funding sought from federal, state and local sources by October 2005 	Coastal Weeds Taskforce , NCWAC, Planning Officer, CMA, DEC, LCAs, DPI, Landcare coordinators, Councils, DoL
1.7 Develop local action plans specifying what actions will be undertaken at each location with all stakeholders.	<ul style="list-style-type: none"> Local coastal weed action plans developed by October 2005 	Coastal Weeds Taskforce , DEC, LCAs, CMA, DPI, Landcare coordinators, DoL, Community groups & individuals
1.8 Work collaboratively with DEC to ensure that priorities within this plan are considered in the development of future Threat Abatement Plans for weeds	<ul style="list-style-type: none"> Key DEC staff are involved in the Coastal Weeds Taskforce and associated correspondence NCWAC discuss regional priority environmental weeds with DEC over the life of the plan 	NCWAC , Coastal Weeds Taskforce, NCWAC Planning Officer, DEC, other stakeholders
Objective 2: Increase awareness and involvement in management of coastal weeds over the life of the plan.		
Action	Performance indicator	Who
2.1 Develop a community education program for coastal weeds	<ul style="list-style-type: none"> Program developed and implemented by October 2005 	Coastal Weeds Taskforce , NCWAC, Planning Officer, CMA, DPI, DEC, Landcare coordinators
2.2 Promote awareness of the threat posed by coastal weeds	<ul style="list-style-type: none"> Promote the threat of coastal weeds at least biannually over the life of the plan through media, local field days, education programs & promotion of problem areas & success stories 	NCWAC , Coastal Weeds Taskforce, Planning Officer, Landcare coordinators, DPI, CMA, DEC
2.3 Promote management of coastal weeds and community groups implementing control	<ul style="list-style-type: none"> Promote best management and monitoring practices, and successful programs at least biannually over the life of the plan Promote community care groups involved in management at the local level at least annually over the life of the plan Support community care groups over the life of the plan 	Coastal Weeds Taskforce (Regional level), Landcare coordinators (Local level), NCWAC, Planning Officer, CMA, DEC, DPI, Coastal Care groups

Objective 3: Implement control and regeneration programs in 50% of identified high priority areas by the end of the plan.		
Action	Performance indicator	Who
3.1 Undertake pre-control assessments and review progress at least annually	<ul style="list-style-type: none"> Surveys implemented before control programs annually, commencing in high priority locations 	NCWAC , LCAs, Councils, DEC, Coastal care groups, Coastal Weeds Taskforce, CMA, DoL, community, contractors
3.2 Undertake and promote licensed seed collection and propagation of local native species where required	<ul style="list-style-type: none"> Licensed seed collection of local native species encouraged over the life of the plan Areas requiring future plantings identified and initial orders made by August 2005 	Coastal Weeds Taskforce (Regional level), DEC , LCAs , Councils , CMA, DoL, Coastal care groups
3.3 Long-term coordinated management projects developed and implemented, commencing in and adjacent to significant environmental areas and other high priority locations	<ul style="list-style-type: none"> Local plans being implemented in 50% of identified high priority areas by the end of the plan 	NCWAC , Coastal Weeds Taskforce, LCAs, CMA, DEC, DoL, Councils, Coastal care groups
3.4 Implement planting programs including ongoing maintenance where required	<ul style="list-style-type: none"> Planting and maintenance programs implemented as required over life of the plan 	NCWAC , LCAs, CMA, DEC, Councils, Coastal care groups, DoL
3.5 Inspect and treat riparian zones and other high priority locations where coastal weeds move inland	<ul style="list-style-type: none"> Riparian zones treated annually 	NCWAC , LCAs, CMA, DEC, DoL, Councils, Coastal care groups
3.6 Control new infestations annually	<ul style="list-style-type: none"> No new infestations become established 	NCWAC , CMA, DEC, LCAs, DoL, Councils, Coastal care groups

Abbreviations:

DEC	Department of Environment and Conservation (includes NPWS and EPA)
DIPNR	Department of Infrastructure, Planning and Natural Resources
DoL	Department of Lands
DPI	New South Wales Department of Primary Industries
EPA	Environment Protection Authority (now part of DEC)
ID	identification
LCAs	local weed control authorities
MNCWAC	NSW Mid North Coast Weeds Advisory Committee
NCWAC	NSW North Coast Weeds Advisory Committee
NP	national park
NPWS	NSW National Parks and Wildlife Service
NWAC	NSW Noxious Weeds Advisory Committee
Qld NRME	Queensland Department of Natural Resources Mines and Energy
WBW	weed buster week

7.0 MONITOR AND REVIEW PROCESS

Standard monitoring procedures for coastal weed control programs will be developed and implemented with the assistance of the Coastal Weeds Taskforce, NCWAC and stakeholders. Monitoring is especially important due to the overall lack of control of some of the species in the past and hence the ability to obtain base-line information to compare with post-control monitoring. As this is a new regional plan and a new approach for many stakeholders it is important to ensure that control programs are effective and efficient.

LCAs who have active control plans review their progress annually prior to the main control season. Reports to NCWAC will be prepared by each LCA detailing actions undertaken. LCAs will be responsible for including information in the reports about activities undertaken by other stakeholders in their local area.

Preliminary mapping of some of the weed species in this plan has been undertaken. One of the first activities to be undertaken by the regional Coastal Weeds Taskforce will be to produce mud maps highlighting the general distribution of all of the priority weed species. These will be enhanced over time, then digitised and used to help monitor the success of future control programs. Other mapping information to be used by the Taskforce and stakeholders is maps of high conservation value landscapes. This mapping will be used to establish high, medium and low priority areas for control and hence will help ensure that high priority areas are being managed.

This regional plan will be fully reviewed before December 2009.

8.0 BENEFITS

Implementation of this plan will lead to a coordinated strategic approach to managing all high priority weeds in the coastal zone. Specific benefits will be:

- A reduction in threats to biodiversity and important assets in the coastal zones rather than replacement of one weed with another.
- Agreement and promotion of best management practices for the control of high priority coastal weeds.
- Maps showing the distribution and abundance of priority coastal weeds - these will give an understanding of the scale and extent of the problem, and in the future, the success of current management programs.
- Agreement and information sharing between stakeholders to help coordinate control actions between different stakeholders and prepare local control plans or strategies.
- The maintenance and expansion of successful existing control programs that have stakeholder support.
- Expansion of current control programs into strategically important areas.
- Community acceptance, involvement and support for controlling priority coastal weeds, including in their own backyards.

9.0 RESOURCES

Source of photographs used in this plan:

Coastcare: Glory lily, ground asparagus, climbing asparagus, mile a minute, blue morning glory, umbrella tree, winter senna and painted spurge

Qld NRME: asparagus fern, mickey mouse plant, purple morning glory, smooth senna, singapore daisy and mossman river grass

Sainty and Associates: turkey rhubarb. <http://www.sainty.com.au/>

Jeff Thomas: Middle and Iluka Bluff

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