

REGIONAL WEED MANAGEMENT PLAN

1.1 PLAN TITLE: Sydney Bitou bush / Boneseed Regional Management Plan

1.2 PLAN PROPONENTS

Regional Weeds Advisory Committee: **South West Sydney Regional Weeds Committee, Sydney North Regional Weeds Committee, Sydney Central Regional Weeds Committee.**

Contact person: **David Croft - Noxious Weeds Officer**

Address: **Sutherland Shire Council, Locked Bag 17 Sutherland NSW 1499**

Telephone number: **9710 5733**

Facsimile number: **9710 5721**

Email address: **dcroft@ssc.nsw.gov.au**

Signature: Date:

1.3 NAME OF PLANT(S)

WONS Y✓

Botanical name(s);

Chrysanthemoides monilifera ssp monilifera

Chrysanthemoides monilifera ssp rotundata

Common name(s):

boneseed

bitou bush

1.4 PLAN PERIOD (not to exceed five years)

Starting date: **July 2004** Completion date: **June 2009**

1.5 AREA OF OPERATION: This plan extends in the Sydney Region from Pittwater Local Control Authority (LCA) in the north to Sutherland LCA in the south, and as far west as Wollondilly LCA, covering the South West Sydney, Sydney Central and Sydney North Regional Weeds Committees' LCA's.

1.6 AIM:

To control the spread and reduce the impacts of a Weed of National Significance (WONS), bitou bush and boneseed on biodiversity (including threatened Species) in the Sydney region of NSW.

1.7 OBJECTIVES (On Ground).

1. Inspections and mapping to be undertaken in any areas not previously surveyed within 1 year.
2. Treating 100% of light infestations within two years and 50% of medium infestations within five years will reduce the spread of bitou bush and boneseed. Heavy infestations are to be contained and prevented from spreading beyond current locations and biological control agents will be released.
3. Any areas infested with bitou bush or boneseed, which are burnt through hazard reduction or wildfire, will be treated to remove seedlings no more than 12 months after the fire event.
4. Undertake Actions outlined in the Bitou Threat Abatement Plan at priority sites

1.7 OBJECTIVES CONT (Strategic).

5. Raise and maintain community awareness in issues relating to Bitou bush and Boneseed control and to actively involve the community in management decisions and control activities.
6. Create and improve linkages between different stakeholders and land managers and encourage a cooperative approach to the control of Bitou bush and Boneseed.
7. Control and reduce the impact of the Key Threatening Process “Invasion of native plant communities by bitou bush and boneseed” as listed on Part 2 of Schedule 3 of the *Threatened Species Conservation Act 1995*. Priority is to be given to sites listed in the Threat Abatement Plan (TAP) or otherwise listed/or acknowledged as threatened from the infestation of bitou bush or Boneseed.
8. Prevent new infestations by continuously monitoring areas, which are currently, weed free but which are considered at risk of invasion. Special priority is to be given to areas that have had previously controlled infestations.
9. Use best practice control techniques when undertaking bitou bush or boneseed control and ensure that management is undertaken with long term biodiversity outcomes in mind.
10. Development and implement Local Control Plans (LCP’s) in all LCA’s involved in this regional plan.
11. Undertake strategic private property inspections and notifications under the Noxious Weeds Act to facilitate coordinated bitou bush and boneseed control.

2.0 STAKEHOLDERS

2.1 Signatories

Sutherland Council, Campbelltown Council, Camden Council, Fairfield Council, Fairfield Council, Liverpool Council, Wollondilly Council, Bankstown Council, Randwick council, Botany Council, Manly Council, Warringah Council, Pittwater council, Waverley Council, Rockdale Council
Department of Environment and Conservation-Parks Service (Formerly NPWS).

2.2 Other stakeholders.

Sydney Water Corporation, the Department of Infrastructure, Planning and Natural Resources (formerly DLWC), The Department of Environment and Conservation (formerly EPA), the La Perouse Aboriginal Land Council, NSW Agriculture, Department of Lands, Rail Infrastructure Corporation, Bushcare Coastcare Reefcare and Landcare community groups and private landholders.

3.0 BACKGROUND and GENERAL FACTS

Bitou bush and boneseed are native to the coastal regions of South Africa. The exact date and manner of introduction of bitou bush into Australia is unknown. The introduction was probably accidental through dumping of ballast by ships arriving from South Africa. The earliest records of bitou bush come from Stockton near Newcastle in 1908. From 1946 to 1968 Bitou bush was planted along the NSW coast by the NSW Soil Conservation Service to reduce soil erosion and assist in post sandmining rehabilitation.

Boneseed was introduced as an ornamental garden plant in the 1850’s in Sydney, Melbourne and Adelaide. It was considered naturalised by 1910.

Both subspecies are now naturalised over extensive areas within the Sydney region. Both are declared noxious weeds under the *Noxious Weeds Act 1993*, and as a Weed Of National Significance (WONS) outlined in the National Weed Strategy, and bitou bush/boneseed is listed as a Key Threatening Process under *Threatened Species Conservation Act 1995*, for which a draft Threat Abatement Plan (TAP) has been prepared

3.1 Weed Biology/Ecology

Characteristic	Shared	Bitou Bush	Boneseed
Leaves	Alternate and 3 to 8 cm long and tapering at the base. Irregularly serrated and shortly storked. The leaves are practically hairless except for a fine cottony down on juvenile plants and leaves.	Leaves ovate to circular and margins less distinctly serrated or toothed.	Leaves ovate to spatulate. Margins coarsely and irregularly serrated or toothed.
Flowers	Florets bright yellow with heads 2-3cm in diameter. They form clusters at the end of branches.	11-13 Ray florets (petals).	5-8 Ray florets (petals).
Fruit	Green and fleshy at first becoming black and succulent. Eventually the outer coating flakes off to reveal a single seed for each fruit		
Seed		Ovoid 5-7mm long and 3-4mm across. Dark brown or black	Globular 6-8mm in diameter with a hard whitish inner coat
Roots	Shallow with no distinct tap root	Produces roots on prostrate stems that come in contact with the ground.	
Habit	Woody perennial Shrubs	A sprawling shrub with long decumbent branches. Unsupported it grows to a height of 2 meters but can grow to 10 meters if supported by other vegetation	An erect shrub to three meters tall. Grows to 1-2 meters wide.
Habitat		Coastal areas of NSW including fore-dunes, hind-dunes, coastal bluffs grasslands heathlands, woodlands and rainforests. Areas that receive summer rainfall.	Coastal and mallee woodlands and drier woodlands and forests. In the Sydney region is present inland from the coast on sandstone ridgelines.

Life Cycle	Seeds germinate at any time of the year with a peak in Autumn. Growth is during winter. In certain conditions plants can flower in the first year but generally plants are at least 18 months old before flowering. About 60% of seed is viable and seeds can remain dormant in the soil for up to 10 years.	Flowers year round but with a peak in April to June.	Flowers formed in late winter to spring. Seeds shed in summer.
-------------------	--	--	--

3.2 Method of Spread

Bitou bush and Boneseed have a range of vectors, which greatly aid seed dispersal. The fruits are easily dispersed by a range of wildlife including native and introduced birds, cattle, rabbits and foxes which have all been known to spread seed, sometimes over considerable distances. Human vectors form the other most significant cause of seed transport, including contaminated soil (seed bank can contain up to 5000 seeds/sq m), attachment to clothing, footwear and vehicles and in dumped garden refuse. Natural vectors such as wind and water dispersion (including sea currents) also occur and in steeper areas seeds tumbling downhill will also result in the gradual spread of these plants.

3.3 Description of the Problem

In the Sydney region, Bitou bush and Boneseed have invaded a variety of natural ecosystems from Pittwater in the north to the Sutherland Shire in the south. Bitou bush has predominantly invaded coastal ecosystems and has become a dominant species in some areas. Boneseed is found further inland in the south around Sutherland where it is found on exposed ridgelines and degraded industrial areas. Boneseed is also found in some coastal areas in the Sydney Harbour National Park and around Avalon where the two species have been known to hybridise.

Bitou bush and Boneseed have invaded headland and dunes (fore and hind). They invade many vegetation types including, dune heathlands and grasslands, coastal woodlands, dune forests, littoral rainforests and estuarine swamp forests many of which are endangered ecological communities in the Sydney region. Severe Bitou bush or Boneseed infestations have detrimental effects on these ecosystems by reducing floral diversity through the creation of a weed monoculture, causing a reduction in faunal habitat thus reducing the habitat and numbers of fauna, and by acting as harbour for pest animal and bird species. Severe infestations have negative impacts on local economies by increasing maintenance costs required to maintain access paths, and tourism can be affected in areas if the visual amenity and floristic diversity are reduced by infestations. Bitou bush poses a threat to several threatened species and ecological communities (listed under the TSC Act), that lead to its listing as a Key Threatening Process under the TSC Act in 1999.

3.4 Reason for the Plan

This plan has been developed to coordinate the regional, strategic management of Bitou bush and Boneseed in the Sydney region and to integrate control practices with the national and state strategies. Threatened species and ecological communities are likely to receive priority for control in the draft bitou bush Threat Abatement Plan (TAP) Bitou bush. The strategies contained in this plan will also contribute to achieving some of the outcomes of the bitou bush TAP.

Currently, Bitou bush has infested approximately 1270 Ha (NPWS BBMPR 2001) of land to varying degrees in the Sydney area. Public awareness of Bitou bush is high in comparison with other weeds but control has often been on an ad hoc basis with little cooperation between various government and non-government organisations and uncertainty concerning the availability of funding year to year. Infestations can return to severe levels within years at sites where control is stopped due to lack of funding. This plan will allow greater cooperation and coordination between different organisations. It will also increase the effectiveness of funding, for example promotional and educational material can be created for the whole region rather than each organisation having to devote time and resources.

Enhanced control and management of Bitou bush and Boneseed will also assist in the conservation of Endangered Ecological Communities (EEC's) listed under the *Threatened Species Conservation Act 1995*, such as the Eastern Suburbs Banksia Scrub, Sydney Freshwater Wetlands and Kurnell Dune Forest, as well as the many threatened plant and animal species which occur in these areas.

3.5 Distribution of the infestations

South West Sydney Region

Sutherland LGA

Infestations of bitou bush in Sutherland shire centre around the Kurnell peninsula with scattered infestations in coastal areas of Cronulla. Areas as surveyed by the NPWS are:

- 213.94 ha – light infestation (<10% cover)
- 315.82 ha – medium infestation (10-40% cover)
- 298.18 ha – heavy infestation (>40% cover)

Boneseed is scattered on ridgelines and wasteland throughout the shire concentrated in the suburbs of Alford's Point, Menai, Heathcote and Sutherland.

Campbelltown LGA

To date no infestations of either Bitou bush or Boneseed have been recorded in Campbelltown LGA. Monitoring will continue.

Camden LGA

Camden has had two isolated plants in the past.
Werombi Road, Elis Lane. Area infested - 5m sq
Alma Road, Leppington. Area infested - 6m sq

Fairfield LGA

To date no infestations of either Bitou bush or Boneseed have been recorded in Fairfield LGA. Monitoring will continue.

Liverpool LGA

To date no infestations of Bitou bush have been recorded in Liverpool LGA. A population of Boneseed exists at Voyager point. This infestation is approximately one hectare in size and is scheduled to be treated in late 2003.

Wollondilly LGA

Bankstown LGA

Boneseed has been recorded at Potts Hill Reservoir and several sites along the Bankstown Railway line. More than half of these sites contained mature plants. Bitou bush has not been recorded in the Bankstown LGA.

Department of Environment and Conservation-Parks Service.

There is a scattered infestation of Boneseed plants on the edge of the Royal National Park in Heathcote.

Sydney Central Region

Randwick LGA

Based on NPWS Mapping Report 2001 for Bitou Bush, Randwick LGA has an estimated 303ha of infested lands.

- 159ha – light infestation (<10% cover)
- 78ha – medium infestation (10-40% cover)
- 66ha – heavy infestation (>40% cover)

Most of the infestations occur on private property and other statutory lands. Randwick Council has been working pro-actively with various stakeholders to ensure additional containment of Bitou Bush on non - Council managed lands occurs, including Malabar Headland, Lake Malabar and the Chifley Bushland Remnant.

Within Council managed lands, Bitou Bush is known to occur in most Council reserves south of Lurline Bay, including Jack Vanny Memorial Reserve, Arthur Byrne Reserve, Pioneers Park, Cromwell Park, Randwick Golf Course, Frenchmans Bay, Yarra Bay and Bicentennial Park.

All major reserves have received initial primary treatment, and are receiving secondary and follow up treatments by bushland regenerators and weed control operators.

La perouse has also one of the highest recorded populations of the *Tortrix* leaf-roller moth on the NSW coast, and it is anticipated that the agent will continue to have a significant impact on surrounding bitou infestations.

Botany LGA

Significant infestations occur in Sir Joseph Banks Park.

Waverley LGA

Infestations occur in council reserves along the coast south of Bronte Beach, at Tamarama, south of Bondi Beach and at Diamond Bay.

Department of Environment and Conservation-Parks Service.

1. Boneseed

Present in Nielsen Park, Green Point (aka Laings Point), Hermitage Foreshore, and all part of Sydney Harbour NP. These are all occasional scattered plants.

2. Bitou. "Light to heavy infestations. Control measures have been used since the 1980s, which have gradually reduced the density over many areas of the National Park. Control measures currently include aerial spraying, hand removal and biological control agents."

Sydney Water Corporation

Sydney North Region

Manly LGA

There are minor scattered plants in the reserves Tania Park, Nolans Bush and Sangrado Reserve in Manly LGA. These reserves have on going bush regeneration programs.

Warringah LGA

Bitou bush infestations in Warringah are now confined to Long Reef headland where it covers about a hectare. This infestation has been halved in the last three years as a result of the activities of a local Reefcare group.

Pittwater LGA

Infestations in Pittwater LGA are at Newport Beach, Newport Beach Track, South Bilgola Headland, North Bilgola Headland, South Avalon Bluff, North Avalon Headland, Norma Reserve, Whale Beach, Whale Beach Rd (Headland below 295 Whale Beach Road), Bungan Beach, Bushrangers Hill and Governor Philip Park. Many of these sites have active community groups.

Department of Environment and Conservation-Parks Service.

1. Lion Island Nature Reserve. Eastern side on lower cliffs. Medium infestation. 1 hectare in size. It was treated at the end of June 2003 by aerial spraying. Follow-up work will be undertaken with funds received from an external grant.

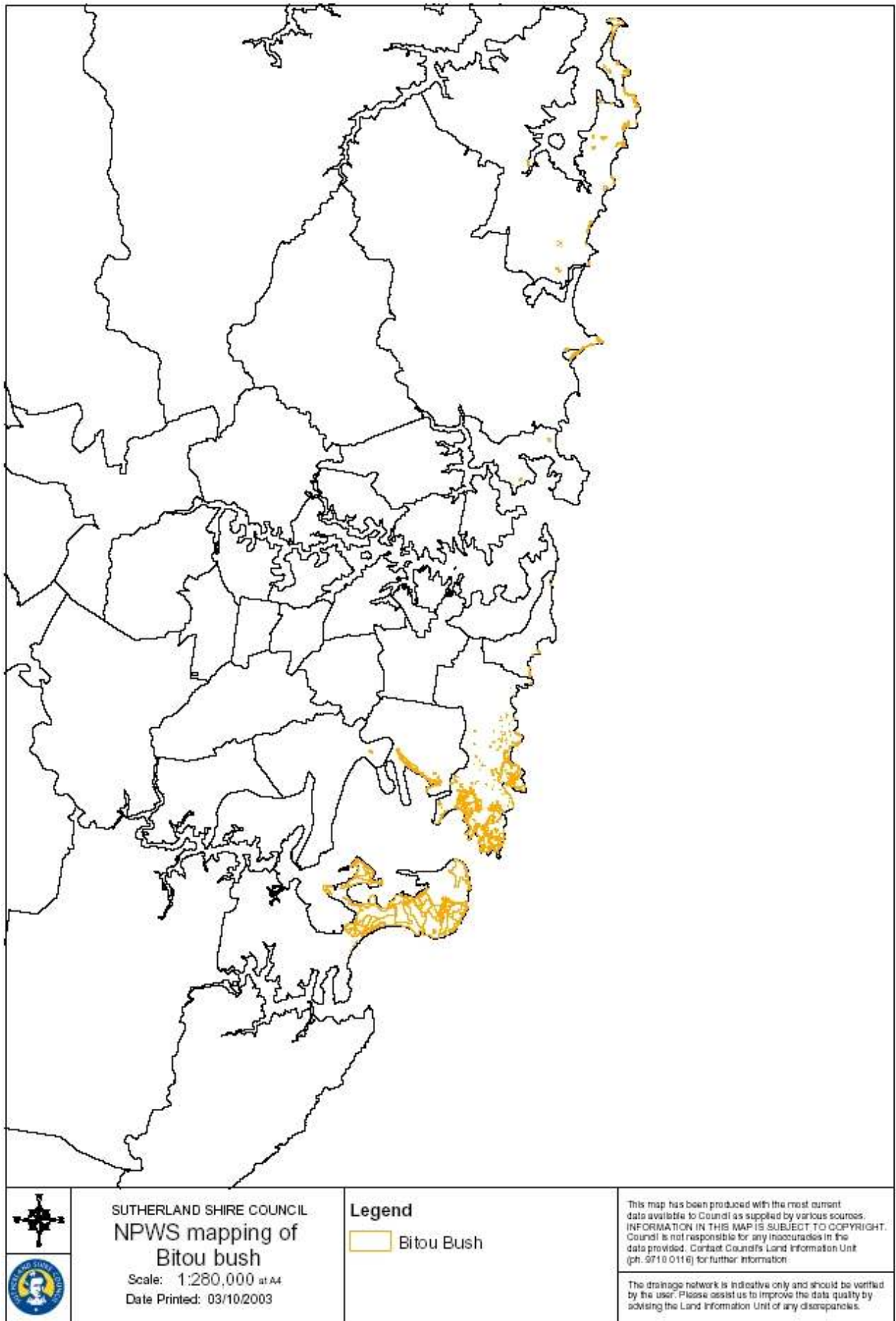
2. Barrenjoey headland within Ku-ring-gai Chase National Park. Southern base of headland on the sandspit. Medium infestation. 2 hectares in size. It was treated at the end of June 2003 by aerial spraying. This site links to an approx. 7hectare Bitou bush infestation (Low to Medium) within Governor Phillip Park, which is managed by Pittwater Council. That area was also treated by aerial spraying at the same time.

Individual Bitou bush plants have also been sighted and controlled on the northern base of Barrenjoey headland, as part of bush regeneration contract works over a number of years.

Rail Infrastructure Corporation.

There are scattered infestation of boneseed on railway land along on the north shore line.

The most recent mapping of Bitou bush provided by the NSW NPWS for the Sydney region is shown on the map below. Yellow outlines indicate the extent of infestations in the different LCA's.



4.0 LEGISLATIVE and REGULATORY SITUATION

4.1 Current Declaration

Sydney Regional Bitou Bush / Boneseed Management Plan (draft)

Chrysanthemoides monilifera is a declared W3 noxious weed under the *Noxious Weeds Act 1993* in all the LCA's in the South West Sydney and Sydney Central regions except for Camden, Campbelltown and Wollondilly. A W3 weed 'must be prevented from spreading and its numbers and distribution reduced'.

Chrysanthemoides monilifera is a declared W2 noxious weed under the *Noxious Weeds Act 1993* in all the LCAs in the Sydney North region except Manly. A W2 'must be fully and continuously suppressed and destroyed'.

Invasion of native plant communities by *Chrysanthemoides monilifera* is listed as a Key Threatening Process under the NSW Threatened Species Conservation Act 1995. Currently, a Threat Abatement Plan (TAP) is being prepared in accordance with the statutory requirements of the Act.

4.2 Declaration Changes

It is proposed that *Chrysanthemoides monilifera* ssp *rotundata* and *monilifera* be declared W2 noxious weeds in all LGA's where it is currently listed as a W3 and in Campbelltown, Camden and Wollondilly LGA's, so that the declarations are consistent Sydney wide.

5.0 CONSIDERATIONS and OPPORTUNITIES

5.1 Opportunities to be exploited

To assist in the implementation of this plan, various sources of funding will continue to be sought from state and federal government agencies, including;

- NSW Agriculture;
- relevant regional funding programs for Catchment Blueprint implementation through the Department of Infrastructure, Planning and natural Resources (DIPNR) and the Catchment Management Authorities;
- the Department of Lands through the Crown Land weed control grant scheme, (where Bitou Bush control has been listed as a priority);
- Environment Australia through any WONS or National Weeds Strategy grants; and
- The Department of Environment and Conservation through any TAP or Threatened species funding which may become available.

5.2 Species Management

Control Options

There are various methods to control Bitou bush/Boneseed, primarily chemical, mechanical and biological control. In areas with small, isolated infestations the most effective strategy is to physically remove the plants, roots and all. Larger infestations can be sprayed with non selective herbicides such as Glyphosate 360g/L. Bitou bush can be sprayed at lower than label rates (eg 1:200) in winter when the plant is actively growing with a high kill rate and reduced off target damage to desirable native species. Large areas can also be sprayed by helicopter using Glyphosate at a rate of 2 litres per hectare or Brush-Off at a rate of 30g in 30L per HA in winter months. Several Biological controls are available for Bitou bush

More comprehensive Information on the control of Bitou bush and Boneseed is available in the Best Practice Management Guides prepared by the CRC for Weed Management Systems (below).



BitouBPMG.pdf



bpmgbbone.pdf

5.3 Extension and Education

Education and extension activities will be undertaken to increase the skills of relevant council staff, community and private landholders in the identification and control of Bitou and Boneseed, and make them aware of the problems. This will be carried out by:

- Participating in regional weed field days and training workshops;
- Training staff and volunteers;
- Media articles in local newspapers;
- On-site advice to private landholders with Bitou bush/Boneseed infestations;
- Production and distribution of weed brochures to private landholders with potential for Bitou bush/Boneseed infestations.

5.4 Links to other Strategies

Weeds of National Significance National Strategy – Bitou bush / Boneseed

This regional plan assists in achieving the following three desired outcomes of the national strategy for Bitou bush and Boneseed:

1. The further introduction and spread of Bitou bush and boneseed is prevented.
2. The adverse impacts of Bitou bush and boneseed on biodiversity are minimised.
3. The national commitment to the coordination and management of Bitou bush and boneseed is maintained.

NSW Bitou bush Strategy:

The desired outcomes of the NSW Bitou bush strategy are largely identical to the aims of the National Strategy. This plan will assist to achieve the aims of the NSW Bitou bush Strategy.

Bitou bush Threat Abatement Plan (TAP)

A draft Threat Abatement Plan (TAP) is currently being prepared by NPWS in order to meet the statutory requirements associated with listing a Key Threatening Process (KTP) under the *NSW Threatened Species Conservation Act 1995* (TSC Act). In order to be listed as a KTP under the TSC Act a threat must meet the requirements of the Act, which include posing a threat two or more threatened species or ecological communities and causing non-threatened species to become threatened. Thus, the draft bitou bush TAP is likely to include the threatened species and endangered ecological communities which are threatened by bitou bush in the Sydney region. As Kurnell Dune Forest, Eastern Suburbs Banksia Scrub and Sutherland Shire Littoral Rainforest are listed as endangered ecological communities under the TSC Act and are within the distribution of bitou bush in the Sydney region it is likely that they will be considered in the draft TAP (P. Downey *pers. comm.* 2003).

Other Plans/strategies

The draft Eastern Suburbs Banksia Scrub Recovery Plan (NPWS 2003) lists bitou bush as a threat.

This Plan also assists in the implementation of the following Catchment Blueprints:

Southern Sydney Catchment Blueprint:

Catchment Targets

CT2 By 2013, land areas are used within their capability to ensure that natural resources of the land are protected or enhanced.

Management targets.

MT14 By 2013, the threats posed to aquatic and terrestrial ecosystems by pest species are measurably reduced.

MT20 From 2003, support encourage and facilitate community groups in remediation, study and management of natural areas.

Management Actions by priority (Action Priority)

AP4 “Implement closely linked strategies and effective action plans supported by government for all major aquatic and terrestrial weeds pests and pathogens using environmentally appropriate management practices and develop contingency plans for potential invasive weeds and pests”.

AP5 “Identify all remaining areas of those aquatic and terrestrial ecological communities which have less than 30% of their original extent remaining” “encourage the active management of these remnants to maintain their long term viability and if possible encourage their expansion”.

AP8 “Prepare and implement education strategies to increase community awareness and understanding of biodiversity and its conservation including key threatening processes”.

Sydney Harbour Catchment Blueprint:

- Management Action No. 33: Develop and implement integrated pest/weed/pathogen management plans for the Board area (aquatic and terrestrial).

Hawkesbury Lower Nepean Catchment Blueprint:

- Management Target 12: Weeds and pests: By 2006 implement adequately funded and closely linked strategies and effective actions plans for all major and potential terrestrial and aquatic weed/pest species.
- Prioritised Management Actions for Biodiversity 6: Resource and implement closely linked strategies and effective action plans developed on a catchment basis for all major aquatic and terrestrial weeds and pests using environmentally appropriate management practices, and develop contingency plans for potential invasive weeds and pests.

5.5 Barriers and Contingencies

Effective management of Bitou bush / Boneseed will be achieved by overcoming the following barriers through the implementation of the respective Actions detailed in Section 6.0:

1. Many members of the public do not recognise Bitou bush or Boneseed.
2. Many members of the public do not realise how these weeds affect the broader public and the environment.

Contingency. Public awareness of the effects of Bitou bush and Boneseed need to be raised.

3. Private property owners can be reluctant to undertake control programs.
4. Control activities undertaken by public authorities are often undertaken in isolation.

Contingency. Agencies need to coordinate weed control activities to ensure that weed control in an area is undertaken by all landholders in the area, enforcing noxious weeds legislation if necessary.

5. Control programs can be hampered by a lack of funding, resources or a guarantee of funding year to year.

Contingency. Land managers need to examine more funding opportunities including private sponsorship programs, volunteer groups and funding from various government organisations. This plan will assist with funding applications submitted on a regional level.

6.0 ACTIONS and PERFORMANCE INDICATORS

ACTION PLAN FOR CONTROL	PERFORMANCE INDICATOR	WHO	ADDRESSES WHICH OBJECTIVES
6.1 Undertake mapping and recording of new and existing infestations and determine priorities.	Number of infestations recorded. Number of areas surveyed. Number of Maps produced	LCA's Public Authorities	1. Inspections and mapping to be undertaken in any areas not previously surveyed within 1 year
6.2 Develop and implement local control plans if not already in place	Plans written and adopted	LCA's Public Authorities	10. To develop and implement Local Control Plans (LCP's) in all LCA's involved in this regional plan
6.3 Conduct public awareness campaigns and information nights prior to large-scale weed control operations (eg helicopter spray).	Number of campaigns conducted. Number of information sessions conducted.	LCA's Public Authorities Community Groups	5. To raise and maintain community awareness in issues relating to Bitou bush and Boneseed control and to actively involve the community in management decisions and control activities
6.4 Raise public awareness and involve them in all levels of decision making and control.	Number of Brochures distributed. Number of field days held.	LCA's Public Authorities Community Groups	5. To raise and maintain community awareness in issues relating to Bitou bush and Boneseed control and to actively involve the community in management decisions and control activities
6.5 Target new, light and medium infestations as a priority.	Measurable reduction in infestations (measured against originally mapped extent)	LCA's Public Authorities Community Groups Private	2. Treating 100% of light infestations within two years and 50% of medium infestations within five years will reduce the spread of Bitou bush and Boneseed. Heavy infestations are to be contained and prevented from spreading beyond current locations and biological control agents will be released

		landholders.	<p>3. Any areas infested with Bitou bush or Boneseed which are burnt through hazard reduction or wildfire will be treated to remove seedlings no more than 12 months after the fire event</p> <p>8. To prevent new infestations by continuously monitoring areas which are currently weed free but which are considered at risk of invasion.</p>
6.6 Re-treat new, light and medium infestations within two years.	Numbers of sites treated	LCA's Public Authorities Community Groups Private landholders.	2. Treating 100% of light infestations within two years and 50% of medium infestations within five years will reduce the spread of Bitou bush and Boneseed. Heavy infestations are to be contained and prevented from spreading beyond current locations and biological control agents will be released.
6.7 Treat suitable infestations with helicopter every two years	Infestations treated	LCA's Public Authorities Private landholders.	2. Treating 100% of light infestations within two years and 50% of medium infestations within five years will reduce the spread of Bitou bush and Boneseed. Heavy infestations are to be contained and prevented from spreading beyond current locations and biological control agents will be released.
6.8 Reseed and Revegetate treated areas and ensure that Bitou bush control does not create other weed invasion opportunities.	Medium and heavy infestations replaced with a diversity of locally native species. This should not be necessary in areas treated for light infestations.	LCA's Public Authorities Community Groups Private landholders.	9. To use best practice control techniques when undertaking Bitou bush or Boneseed control and ensure that management is undertaken with long term biodiversity outcomes in mind
6.9 Promote the use of integrated control measures (herbicide, biological hand removal etc)	Number of Field days Number of Biological agent release sites.	LCA's Public Authorities Community Groups Private landholders.	9. To use best practice control techniques when undertaking Bitou bush or Boneseed control and ensure that management is undertaken with long term biodiversity outcomes in mind
6.10 Priority is to be given to areas of significance or as listed in the TAP.	Significant areas located and mapped. Number of treatments undertaken.	LCA's Public Authorities Community Groups Private landholders.	7. To control and reduce the impact of a Key Threatening Process as listed under the <i>Threatened Species Conservation Act 1995</i> . Priority is to be given to species, populations and ecological communities and sites listed in the bitou bush Threat Abatement Plan (TAP) or otherwise listed, or acknowledged as

			threatened as a result of bitou bush or boneseed infestation
6.11 Promote linkages between government organisations, NGO's and private landholders to ensure coordinated control.	Number of new programs Volunteer hours worked Weed officer hours involved in community coordination	LCA's Public Authorities	6. To create and improve linkages between different stakeholders and land managers and encourage a cooperative approach to the control of Bitou bush and Boneseed
6.12 Promote and encourage control on private land, and undertake inspections and notifications under the Noxious Weeds Act.	Number of inspections undertaken Number of reinspections Number of notices sent Number of Prosecutions	LCA's	11. To undertake strategic private property inspections and notifications under the Noxious Weeds Act to facilitate coordinated Bitou bush and Boneseed control
6.13 Provide training in identification and control to staff and members of the public who are involved in weed control programs.	Number of training courses attended Hours of Training Number of volunteer courses run	LCA's Public Authorities	5. To raise and maintain community awareness in issues relating to Bitou bush and Boneseed control and to actively involve the community in management decisions and control activities
6.14 Submit funding applications to relevant funding bodies to ensure that maximum resources can be allocated to this high priority weed.	Number of applications submitted Number of new applications submitted.	LCA's Public Authorities	2. Treating 100% of light infestations within two years and 50% of medium infestations within five years will reduce the spread of Bitou bush and Boneseed. Heavy infestations are to be contained and prevented from spreading beyond current locations and biological control agents will be released.

7.0 MONITOR and REVIEW PROCESS

All participants in this plan will monitor and review the progress of the plan in their area, against the performance indicators, in their annual reports. The plan will also be reviewed annually to allow for any additional/new information.

All known infestation sites will be monitored, and follow-up treatments undertaken where required, as part of the on-going implementation of the action plan. The effectiveness of the control techniques will also be monitored and modified as required. Monitoring of the sites identified in the draft bitou bush TAP will be a key objective of the TAP. Therefore, monitoring of any sites identified in the TAP within the Sydney region should be given priority in this plan.

Follow up inspections and mapping will be undertaken annually to measure changes in the extent of Bitou bush / Boneseed infestations and if there has been a reduction in size and numbers of infestations. Mapping should be undertaken in accordance with other mapping strategies and methods previously (and presently) used by other agencies (ie. the former NPWS) to map bitou bush and boneseed (as highlighted in a WONS discussion paper: see Thackway *et al.* 2003), so that the data can be integrated into a bigger data set (ie. that compiled by NPWS: see NPWS 2001).

8.0 BENEFITS

Bitou bush and Boneseed infestations cause various levels degrees of ecological, economic and social impacts for many areas in the Sydney region. Implementation of the objectives of this and other related plans, which result in the reduction of the impacts of these plants on natural areas, will result in significant benefits to the environment and community. Reducing the effects of Bitou bush and boneseed will result in an increase of ecological diversity and health in natural areas of the Sydney region and significantly improve the aesthetic appeal of these regions. This will have a flow on effect through such industries as tourism and will improve not only environmental values in the region but also economic and social. This plan will also complement existing regional plans on the South Coast and North Coast of NSW and lead to better bitou bush control in the Sydney region and NSW as a whole.

Specific benefits will include:

- The plan will guide the control and management of these pest plants in the Sydney region and provide a practical assessment of the effectiveness of those efforts.
- Local land managers and other stakeholders will receive guidelines for management at a local level especially relating to the preparation of regional plans.
- The plan will reinforce the need for and emphasise the value of existing control activities and stimulate further control programs in areas not previously treated.
- The plan will build on community knowledge and support of Bitou bush and Boneseed control and encourage increased participation in future programs.
- Long-term costs will be reduced through effective and targeted control programs and the potential for the centralisation of promotional and educational resources.

9.0 RESOURCES

Parsons, W.T. and Cuthbertson, E.G. (1992). **Noxious Weeds of Australia**. Melbourne: Inkata press.

Control of Noxious Weeds Handbook (1999). published by NSW Agriculture.

Agriculture & Resource Management Council of Australia & New Zealand, Australian & New Zealand Environment & Conservation Council and Forestry Ministers, (2000). **Weeds of National Significance Bitou bush and Boneseed (*Chrysanthemoides monilifera* ssp. *rotundata* and *monilifera*) Strategic Plan**. National Weeds Strategy Executive Committee, Launceston.

NSW National Parks and Wildlife Service (2001). **NSW Bitou bush Strategy**. NSW National Parks and Wildlife Service, Sydney.

NPWS (National Parks and Wildlife Service) (2003). *Eastern Suburbs Banksia Scrub Endangered Ecological Community Draft Recovery Plan*. NSW National Parks and Wildlife Service, Hurstville.

Thackway, R., Yapp, G., Cunningham, D., McNaught, I., (2003) *Towards a national set of core attributes for mapping Weeds of National Significance (WONS)*. Discussion paper, September 2003. Bureau of Rural Sciences, Canberra.