

# REGIONAL WEED MANAGEMENT PLAN

1.1	PLAN TITLE: BLUE HELIOTROPE CONTROL IN THE NEW ENGLAND AND NORTH WEST REGIONS OF NSW
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<b>1.2 PLAN PROPONENTS</b>	
Regional Weeds Advisory Committee:	Northern Inland Weeds Advisory Committee (NIWAC)
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Signature: Chairman	Date: Submitted 30 Oct 2004

<b>1.3 NAME OF PLANT(S)</b>	<b>WONS</b>	<b>NO</b>
Botanical name(s): <i>Heliotropium amlexicaule</i>	Blue heliotrope	

<b>1.4 PLAN PERIOD (not to exceed five years)</b>			
Starting date:	1 <sup>st</sup> July 2005	Completion date:	30 <sup>th</sup> June 2010

**1.5 AREA OF OPERATION**

This plan covers the area of the Northern Inland Weeds Advisory Committee (NIWAC) as indicated in the *attached map*. The total area covered by NIWAC is about 100 000 km<sup>2</sup> extending from the Liverpool Range in the south, to the Queensland border in the north, east to the New England tablelands and west to Moree Plains and Narrabri shires. The LCAs participating in this plan account for about half of the total NIWAC area.

- 1.6 AIM - TO MINIMISE THE SPREAD OF BLUE HELIOTROPE THROUGH THE REGION**
- 1.7 OBJECTIVES**
1. Eradicate rare and isolated infestations of Blue Heliotrope on public land by June 2010.
  2. Limit any further spread of Blue Heliotrope to areas of Public land that are currently not infested.
  3. Contain existing infestations to their current location and reduce by one infestation category by June 2010.
  4. Increase awareness about the threat from Blue Heliotrope and the available management options.

## **2. STAKEHOLDERS**

### **2.1 Signatories - organisations committed to the objectives/performance measures of this plan**

- Glen Innes Severn Council (GISC)
- Gunnedah Shire Council (GSC);
- Gwydir Shire Council (GwSC);
- Inverell Shire Council (ISC);
- Moree Plains Shire Council (MPSC);
- Narrabri Shire Council (NSC); and
- Tamworth Regional Council (TRC)

All of these organisations are within the NIWAC area. These stakeholders contributed to the plan via a regional planning workshop and were given other opportunities for input. Not all listed stakeholders necessarily have Blue heliotrope in their area. Those that don't have it are involved in the plan because they are committed to keeping their area free of Blue heliotrope.

### **2.2 Other stakeholders - interested parties consulted as part of this planning process.**

All Local Control Authorities and Rural Land Protection Boards were invited to be part of this planning process, as was State Forests and the Department of Environment and Conservation (formerly National Parks and Wildlife Service).

## **3. BACKGROUND & JUSTIFICATION**

### **3.1 Plan justification - reason for this plan**

This is the first time that NIWAC has taken a regional approach to Blue Heliotrope. This coordinated approach is necessary to slow the spread of Blue Heliotrope across the region. This is particularly relevant where heavily infested areas/shires adjoin clean areas/shires. These clean shires are keen to ensure that they remain that way and believe that a regional plan will provide a focus to achieve this outcome.

This plan was also prompted by concerns raised by a private landholder about the spread of Blue Heliotrope in the western part of the Liverpool Plains Shire. NIWAC discussed these concerns and agreed that a regional plan is the most appropriate action to manage the existing infestations and avert any further problems.

#### **3.1.1 Description of the problem**

##### **Current and potential impact of the problem**

The current impact of Blue heliotrope varies across the region. In Moree Plains Shire infestations are already having a major impact, particularly at the foothills of the Nandewar Ranges where Blue heliotrope is more widespread, and has more of an impact, than Paterson's Curse (pers comm. Mick Kane, weeds Officer, MPSC).

Given the method of spread and the difficulty in killing the plant, there is huge potential for Blue heliotrope to spread and seriously impact onshires that currently have infestations under control. This includes Gunnedah and Narrabri Shires and the northern part of Tamworth Regional Council area.

Blue heliotrope could potentially infest Kaputar National Park and other natural areas as is the case in Warrumbungle National Park where it is a weed of great concern. It was first observed in the park in the late 1960s and is thought to have been introduced by a visitor's vehicle.

#### **Why it is important that this weed is controlled?**

Blue heliotrope is present in more than 110,000 hectares in NSW alone and has been spreading rapidly in recent years. Herbicides have had limited success in reducing its impact and have not stopped its spread. It is poisonous to stock, particularly young animals. Mildly affected animals can survive but severely affected animals usually die. Humans are also susceptible to poisoning by these hepatotoxic alkaloids. Along roadsides, Blue heliotrope also impacts on biodiversity by competing with, and crowding out, more desirable species

#### **3.2 Do nothing scenario**

Without a coordinated approach, Blue heliotrope could continue to spread from areas which are heavily infested to adjacent areas that are reasonably clean at this stage. Blue heliotrope is a major problem in other parts of NSW, including some shires that adjoin the southern/south western part of the NIWAC region - we want to avoid this situation from developing in our area.

#### **3.3 Distribution of infestations - where it occurs.**

Originally introduced in the 19th century as an ornamental garden plant, Blue heliotrope has now spread from southern Queensland as far south as the Victorian border and into South Australia. Blue heliotrope is found in various situations; common as a weed along roadsides, in fallows and degraded pastures, on a variety of soil types including sandy red earth and is particularly aggressive on the deep red loams.

*The table below gives an overview of distribution of infestations, by LCA, in the NIWAC area.*

Organisation	Extent and location of infestations
Gunnedah Shire Council	Limited to roads with about 5% of the total shire infested. Infestations are largely seasonal and are found along the Namoi River at Carroll and near Premer (Cliff Rd).
Liverpool Plains Shire Council	Similar situation to Gunnedah Shire. There is some concern over roadside spread. On private property, changes in farming practices have limited and influenced the spread.
Moree Plains Shire Council	Widespread with major infestations at Terri Hi Hi, at the foothills of the Nandewar Ranges. Isolated patches are common on the eastern side of the Newell Highway.
Narrabri Shire Council	Infestations limited to Baan Baa and Boggabri. Only 1 property is infested, with some plants also found along the railway at Edgeroi.
North West Weeds	Significant on private property and roads. About 10% of the total area is infested with some heavy infestations, particularly near Warwick on the NSW/QLD border.
Tamworth Regional Council	A massive problem, affecting an estimated 10% of the Tamworth area. Key locations include Woolbrook, Limbri, Piallamore, Loomberah, Kootingal and Nemingha. However, in the upper part of TRC area, there is only one spot west of Barraba.

### 3.4 Biology

Blue heliotrope is a hairy, prostrate perennial herb growing from 15 to 30 cm high.

**Stems** - Dull green, alternate 3 to 7 cm long and 8 to 20 mm wide with wavy margins and thick hair and hairy veins on the underside of the leaves.

**Flowers** - purple or lilac with a yellow centre, tubular, 4 to 5 mm long and 5 to 6 mm in diameter when fully open. Blue heliotrope flowers in late spring and summer and the flowers look similar to Paterson's curse.

**Fruit and seeds** - succulent and roughly globular at first then becoming wrinkled as it matures and then splits into two separate nutlets, each with 2 small, black seeds.

**Roots** - Blue heliotrope has a slender taproot to over 1 metre with a complex system of laterals.

### 3.5 Method and rate of spread

Seeds germinate through summer as long as moisture is available. Blue heliotrope spreads rapidly because of the abundant seed output and the fact that it can grow from root buds and plant fragments. Seeds stick to wool and still remain viable after passing through most animals. Seeds are also moved by water and in mud sticking to hooves, machinery and other vehicles. Blue heliotrope

seed is occasionally found as a contaminant of produce and is readily spread during road maintenance operations. Gravel seems to be the cause of spread in the Liverpool Plains Shire Council area.

### Current rate of spread

LCAs in this plan report that the spread of Blue heliotrope is largely seasonal and varies significantly across the region. Narrabri Shire Council report that it doesn't seem to be spreading while Gunnedah Shire says that it is difficult to determine if it is or isn't spreading. However, plants seem to reappear each year in the same locations.

In the eastern and north eastern section of Tamworth Regional Council the spread has been quite rapid over recent years, spreading from initial infestations in the upper Peel Valley, around Nundle. However, infestations are maintained at their current level in the northern half of the area, around Barraba.

Early in 2004, NIWAC was approached from a landholder in the Liverpool Plains Shire about the explosion of the weed over the last few years; this concern mainly relates to the spread along roadsides in the Premer area.

### 3.6 Species Management

**Physical** - Single plants can be dug out or cut out.

**Mechanical** - cultivation is usually ineffective because it stimulates germination of seeds and encourages regeneration from plant parts.

**Chemical** - herbicides are effective for the control of Blue heliotrope. Actively growing young plants should be sprayed in early summer before flowering stems appear. Chemical options include Triclopyr + picloram (various trade names), Dicamba (various trade names) Picloram + 2, 4 D (Tordon 75 D), Fluroxypyr (Starane ® 200), Tebuthiuron (Graslan ®), Metsulfuron methyl, Glyphosate 360 g/L (various trade names).

**Biological control** - Following research in Argentina, two insects, the leaf-beetle *Deuterocampta quadrijuga* and the root-feeding flea-beetle *Longitarsus sp.*, were prioritised for the biological control of blue heliotrope in Australia. The leaf-beetle can build up population levels rapidly and can completely defoliate blue heliotrope plants. Larvae of the flea-beetle feed on the finer hair roots of the plant, which reduces its ability to take up water and nutrients. The strategy is to use the leaf beetle together with the adult flea-beetles to attack different parts of the plant. This should increase the chances of successful biological control.

NSW Agriculture's Weed Biological Control Unit released the leaf feeding beetles on the Upper Horton properties "Kildare" and "Trevallyn" on 7 Jan 2003. The beetles show great promise in laboratory tests but their attractive "colour scheme" may make them a target for birds.

### *Deuterocampta quadrijuga.*

The blue heliotrope leaf-beetle is a large (up to 10 mm long) black beetle with an orange stripe. Both larvae and adults feed on the leaves of Blue heliotrope. Female beetles have been recorded to live up to 4 months and lay over 1400 eggs (under laboratory conditions). Under field conditions, the beetles will live for 8 to 10 weeks and lay several hundreds eggs. The orange, oval-shaped eggs are generally laid in small clusters on the underside of blue heliotrope leaves. The larvae of the beetle emerge from the eggs and feed on the leaves. After feeding, they leave the plant to pupate in the soil nearby. There are several overlapping generations per year. Progeny of the autumn generation of leaf-beetle over winter as pupae from late May to the end of September, when adults emerge to feed, mate and lay eggs. At high densities, leaf-beetles can completely defoliate the target weed. Massive larval and adult populations of the beetle have been recorded defoliating blue heliotrope in its native range.

### *Flea Beetle*

Adults of the flea beetle are extremely small (less than 2 mm long) and live for one to two months, feeding on leaf tissue by chewing "shot holes" into the leaves. Adults mate, then females burrow into the ground and lay between 12 and 15 tiny cream-coloured eggs on the roots of the blue heliotrope plant. Larvae emerge from the eggs after about 2 weeks and feed on the fine roots of the plant. They may spend up to 3 to 4 months in the ground before pupating and emerging as adults. They will go through successive generations whilst conditions are favourable. The life cycle slows down considerably during the winter months. The flea-beetles have also been credited with the death of blue heliotrope plants in its native range.

## 3.7 Key land managers

Given that Blue Heliotrope is spread very effectively by machinery, clothing and livestock, the success of this plan will hinge on the coordinated efforts of many land managers.

**Local Control Authorities** - have a responsibility to control infestations on LCA land, conduct extension activities, inspect private properties and record details of Blue heliotrope infestations and coordinate the efforts of other stakeholders.

**Local Councils** - Councils also have a responsibility to minimise the spread of weed seed through routine operations such as slashing, grading and road construction. These efforts need to be integrated with the work of the Weeds Officers.

**Northern Inland Weeds Advisory Committee (NIWAC)** - the regional weeds committee will be responsible for developing policy and encouraging all LCAs and RLPBs to adopt this policy. They also provide a focus for coordination and annual review and monitoring of proposed actions.

**Private land managers** - because Blue heliotrope is only declared noxious in Gunnedah and Narrabri Shires, only landholders in these areas have a legal responsibility to control it.

## 4. REGULATORY SITUATION

### 4.1 Current declaration

Blue heliotrope is listed as a W2 weed in Gunnedah Shire and a W3 weed in Narrabri Shire.

### 4.2 Declaration changes

No declaration changes are proposed at this stage. Infestations in the Gwydir and Inverell Shires are too widespread to enforce any noxious weed declaration, as is the case with the majority of the area covered by Tamworth Regional Council. The only possible option may be to apply for declaration if the Moree Plains Shire. However, even if Blue heliotrope was declared it is unlikely that Moree Plains Shire Council would have adequate financial resources to spend on its control.

## 5. CONSIDERATIONS & OPPORTUNITIES.

### 5.1 Financial support to carry out the plan

All stakeholders listed in this plan will contribute a significant proportion of their own funds towards implementing this regional plan. Department of Primary Industries noxious grant funding will also be accessed. However, given the limited nature of these funds, it is expected that this will only account for a small percentage of total expenditure to implement this plan.

*The Action Plan section of this plan indicates the funding source for specific actions.*

### 5.2 Links to other strategies

This Plan forms part of the NIWAC **Regional Strategy**. Some extension activities, particularly those that relate to more than one weed, are also addressed through the Regional Strategy

Many of the activities in this plan, and underlying principles, reflect those in the **State Weeds Strategy**.

The inspection and extension activities associated with this plan will—in the main—be combined with the normal LCA inspection and coordination program.

### 5.3 Barriers and contingencies

Barriers restrict what can be done and how. Identifying these barriers is the first step to overcoming them. In the case of Blue Heliotrope, the most significant limiting factor is that herbicides have had limited success in reducing its impact and have not stopped its spread. This is part of the reason for the emphasis on biological control.

The main contingencies relate to factors that are beyond the scope of this plan eg. Climatic conditions and financial resources available to land managers for control.

## **ACTION PLAN**

## CONTROL AND MANAGEMENT ACTIONS

- Related objectives:**
- Eradicate rare and isolated infestations on public land**
  - Limit any further spread to areas of public land that are not infested.**
  - Contain existing infestations and reduce by one infestation category**

Limiting the spread along roadsides has implications for weed control as well as other council operations, particularly given that plant material seems to be spread in construction materials. The priority for control is those small and isolated infestations.

				While not included in the DPI format for regional plans these columns are included so every stakeholder can look at the plan and know exactly what they are expected to do and when by			
NO	ACTION (WHAT)	PERFORMANCE INDICATOR	BY WHOM	WHERE	WHEN	PRIORITY	\$ SOURCE
1.	Maintain buffer zones between clean and infested areas to minimise spread.	No further spread of infestations	LCAs and RLPBS	Between infested and clean areas	Ongoing	HIGHLY DESIRABLE	DPI group project funds Council funds
2.	Control Blue Heliotrope on identified roadsides.	All roads sprayed annually.	Relevant LCAs - GSC, NSC	Marginal and rare/isolated	Annually	ESSENTIAL	DPI group project. LCA funds
3.	Develop/adopt roadside management principles to minimise the spread through activities such as road maintenance and construction.	Principles adopted as policy by all Councils and LCAs in the NIWAC region	Policy developed and promoted through NIWAC, adopted by LCAs and councils	All areas	Ongoing	HIGHLY DESIRABLE	Council funds
4.	Coordinate the distribution of Blue heliotrope beetles.	Beetles released at key sites across the region.	Relevant LCAs coordinated through NIWAC, in conjunction with DPI.		Ongoing	HIGHLY DESIRABLE	Council funds

**EXTENSION AND AWARENESS ACTIVITIES**

People in those areas that don't currently have Blue heliotrope must be made aware of the potential impacts so they are convinced of the need to keep their area Blue heliotrope free. Similarly by understanding the methods of spread, they will be in a better position to prevent invasion into their area.

				While not included in the DPI format for regional plans these columns are included so every stakeholder can look at the plan and know exactly what they are expected to do and when by			
NO	ACTION (WHAT)	PERFORMANCE INDICATOR	BY WHOM	WHERE	WHEN	PRIORITY	\$ SOURCE
5.	Promote the importance of ongoing treatment for effective management and control of Blue Heliotrope.	2 extension activities per LCA annually.	LCAs	Areas with existing infestations	Ongoing	HIGHLY DESIRABLE	LCA funds
6.	Promote the poisonous properties of Blue Heliotrope.	As above	LCAs with RLPBs	All areas with existing infestations	Ongoing	HIGHLY DESIRABLE	LCA funds
7.	Promote the need to maintain the area as Blue Heliotrope free.	As above	LCAs	Areas without infestations - TRC	Ongoing	HIGHLY DESIRABLE	LCA funds
8.	Target machinery re sellers, landholders and contract operators about the importance of machinery hygiene to limit spread.	All machinery sellers and contract operators visited/targeted annually.	LCAs	All areas	Ongoing	HIGHLY DESIRABLE	LCA funds

## SURVEILLANCE AND MONITORING STRATEGY

### Related objectives:

Surveillance is important to gain a better understanding of the extent and impact of the problem, to monitor any changes in the situation, identify any new outbreaks and allow for early intervention. Without this feedback it is impossible to know if the situation is improving or getting worse and to decide how to best direct resources to meet the plan aims and objectives.

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NO	ACTION (WHAT)	PERFORMANCE INDICATOR	BY WHOM	WHERE	WHEN	PRIORITY	\$ SOURCE
9.	Identify and map current infestations on private land.	All properties inspected at least every five years.	LCAs - Narrabri and Gunnedah Shires	All private land in relevant LCAs	During normal inspection cycles	ESSENTIAL	Council funds
10.	Identify and map infestations on all roads, TSRS and other areas of public land.	All roads inspected twice annually.	Public land managers	All public land, all levels of infestation	Annually between March & October	ESSENTIAL	DPI group project funds LCA & RLPB funds
11.	Reinspect properties with major infestations.	Infested properties inspected annually.	LCA inspectors - Narrabri and Gunnedah Shires	NSC, GSC	Annually between March & Oct	ESSENTIAL	LCA funds DPI Inspection grant
12.	Monitor the effectiveness of leaf eating beetles in controlling Blue heliotrope	Release sites monitored for success.	LCAs with DPI and CSIRO staff			HIGHLY DESIRABLE	LCA funds DPI Inspection grant

## **7 MONITORING & REVIEW PROCESSES**

Each stakeholder will be required to report against performance indicators at least annually. Stakeholders must provide regular updates on the infestations in their area, using a format that is endorsed by NIWAC. These reports will include details of spraying activity and results from inspections including the number of properties inspected, number infested, the hectares infested and the type of infestations.

Stakeholders will also be encouraged to use NIWAC meetings to report on any regionally significant issues.

## **8. BENEFITS**

By adopting this plan we hope to:

- Minimise the risk of spread from infested to clean areas - in the long run this should reduce control costs;
- Reduce the impact on biodiversity and improve the roadside environment - this is of public benefit;
- Minimise the risk of livestock poisoning from Blue heliotrope;
- Capitalise on, and complement, the biological control work being conducted by CSIRO.

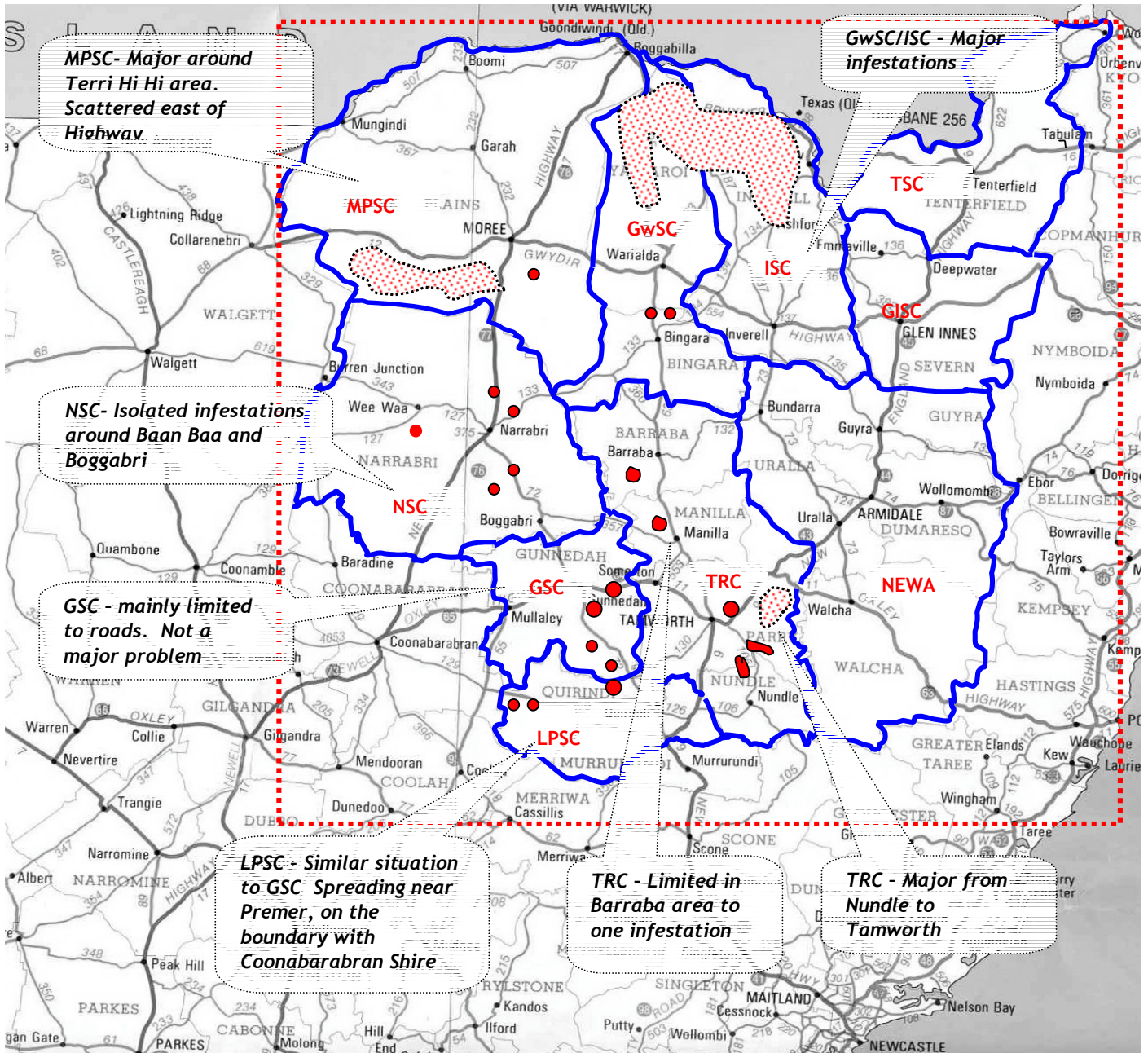
## **9. RESOURCES**

CSIRO web site - Blue Heliotrope Biological Control Information Sheet [csiro.gov.au](http://csiro.gov.au)

NSW Agriculture (2004) Noxious and Environmental Weed Control Handbook 2004-2005 - A guide to weed control in non-crop, aquatic and bushland situations

Parsons and Cuthbertson - Noxious Plants of Australia, Inkata Press

NIWAC REGIONAL WEED MANAGEMENT PLAN - (SUBMITTED NOVEMBER 2004)  
 BLUE HELIOTROPE - REGIONAL MAP



KEY

CODE

LGA Boundaries

GIMC Glen Innes Severn Council

GSC Gunnedah Shire Council

GwSC Gwydir Shire Council

ISC Inverell Shire Council

LPSC Liverpool Plains Shire Council

MPSC Liverpool Plains Shire Council

NIWAC regional boundary

NSC

Narrabri Shire Council

NEWA

New England Weeds Authority

TRC

Tamworth Regional Council

TSC

Tenterfield Shire Council

Scattered infestations - not to scale

Denser infestations - not to scale