# Nymboida River Project





Management Plan River Reach Project 2005











Map 1.



#### **Introduction**

The Nymboida River Project is the first project of its type and scale in the lower reaches of the Nymboida River. The Project is funded by the Northern Rivers Catchment Management Authority, part of the Reach Based River Health Program. The project is being managed by Clarence Landcare Inc. a community based organization which coordinates Landcare groups and Landcare activities in the Mid-Lower Clarence Catchment.

Clarence Landcare Inc. approached landowners of the Nymboida River to announce the idea of coordinating a project such as this and was overwhelmed by the interest and support for the project. The prerequisite for obtaining funding was for a planning process extending over one kilometre of stream. The Nymboida River Project extends over 50 kilometres of river length from the "The Junction" of the Nymboida and Little Nymboida Rivers to beyond Buccarumbi. It involves 26 landowners with landholdings covering 65km of river bank (single sided). [See map no. 2]

The Nymboida River Project is made up of properties from 0.75Ha—2,500 Ha in size, from 20 metres of river bank to 13 km of river bank length. The land tenure of properties involved ranges from ownership for 2.5 years to the property being in the family name since selection days.

The Project extends over 50 kilometres of river length...It involves 26 landowners with landholdings covering 65km of river bank



Photo taken from McLennan's looking downstream

# The Project

The river reach project is about identifying reaches of river to assist landowners with active management in order to achieve measurable improvement to the health of their river(bank).

The stages of this project included:

- 1. Contacting Riverbank landowners my mail.
- 2. Public Meeting to discuss project scope and individuals riparian issues
- 3. Identifying interested landowners and length of riverbank.
- 4. Broad scale mapping of riparian (riverbank) vegetation condition. [Maps no. 3, 4 & 5]
- 5. Property visits to:
  - Meet land owners
  - Obtain information regarding riparian history & management issues
  - Inspect acessable riparian zone
  - Work with landowners to select project sites.
  - Map these project sites on to aerial photographs.
- 6. Engage consultant to assess and cost weed control work on selected sites.
- 7. Collate collected data, prepare draft report and property site management plans
- 8. Receive feedback from landowners regarding draft report and plans.
- 9. Finalise report

# Working with landowners to select project sites.



Photo taken from Pender's looking upstream, over the weir wall to Blazejowski & Sullivan's Project Site no.1

## Riparian Vegetation Condition - Rapid Assessment Color codes based on Lower—mid storey weed density mapping

#### Methodology

The project area extends over 60km of river length from the Junction of the Nymboida and Little Nymboida Rivers downstream to Doboy. Much of the terrain is rugged and inaccessible. In order to gain a feel for vegetation management issues along this stretch, a rapid assessment technique was devised so that vegetation condition could be mapped and colour coded according to relative percentages of native and weed cover in the lower -mid storey. The riparian zone was taken as that within 20m of the mean waters edge, or the conceivable height of vegetation influence on the channel for steep areas. Due to the scale of the map and for visual purposes, the width of the coloured buffer is depicted as far greater than that visible in the field. Therefore it is important that persons reading the map do not interpret coloured buffer width as actual assessed width on ground. Further methodology and data limitations are stated in Appendix No. X

Classification groupings for Mid to Lower storey vegetation were as follows:

Green:	<b>0-25%</b> of the mid-lower canopy are weeds
Blue:	<b>25-50%</b> of the mid-lower canopy are weeds
<b>Orange:</b>	<b>50-75%</b> of the mid-lower canopy are weeds
Red:	<b>75-100%</b> of the mid-lower canopy are weeds
Cleared:	All lower, mid and upper storey vegetation removed (usually persistent
	as pasture or bare gravel)

# **General Trends Observed in Riparian Vegetation Assessment**

Whilst the quality and extent of riparian vegetation along the Lower Nymboida river varies, it is generally in very good condition. In many areas the riparian overstorey vegetation extends into adjoining hillside vegetation whilst in other areas it is confined to thin strips along the water's edge. Small leaved privet and lantana are the most dominant riparian weeds and have had a greater impact upon the condition of the mid and understorey riparian vegetation.

The percentage of weeds comprising the riparian vegetation is often related to the location within the channel. There is usually good native riparian vegetation along the water's edge, however, steep banks, particularly those of flood chutes, are often infested by privet and or lantana. Many steep banks have an overstorey of eucalypt and or river oak with a privet or lantana mid and understorey. Steep, previously cleared river banks, are often too steep to manage and have become characterised as orange and red zones. High energy environments, such as, rock walls on outside bends and reaches of steeper gradient are often relatively weed free. Deposition areas, on the other hand,



such as gravel bars on inside bends or where eddying currents are created at the junctions of creeks and in concaves along steep hillsides or rock walls, usually have a high percentage of weeds in the mid and understorey.

Newly developed gravel bars and islands seem to be more readily colonised by natives than weeds with river oaks dominating this process upstream of the Oaky creek junction and river bottlebrush downstream. Privet seems to be the more dominant weed upstream of the Oaky creek junction and lantana downstream. The use of fire for weed management seems to impact on privet more than lantana and may explain this perceived pattern.

Downstream of Buccarumbi, where the Nymboida and Boyd Rivers junction, the channel is much larger with very large gravel bars. Vegetation on these bars often only exists as thin strips along gravel ridges between flood runners, which intersect the gravel bar. "Steep, previously cleared river banks, are often too steep to manage and have become characterised as orange and red zones"



"Much of the terrain is rugged and inaccessible."



Gravel bar deposited in the 2001 colonized my river oaks.



Mapping undertaken by: T Broderick & P Menzies—NRCMA Officers Map Produced by: P Menzies Map Produced for : Clarence Landcare Inc.

## **Observations**

#### **Project Area Characteristics & River Health**

The quality and diversity of the native riparian vegetation of the Nymboida River is on a whole generally very good. The key water's edge species within the project area consist of Lomandra, Bottlebrush, Creek Tea Tree, River Oak and Watergum with many other diverse species interwoven throughout the riparian zone.

Weeds (plants not native to the area) in the riparian zone pose a threat to the biodiversity and health of the river. They compete with the natural regeneration of native plants and in some cases (e.g. cats claw creeper) will kill mature trees. Native riparian species are important to sustain the native mammal, bird and aquatic life associated with the Nymboida River system.

The river's bank and bed are in very good condition with only relatively minor bank erosion and slumping generally caused by past vegetation clearing, the falling of a single tree and minor point specific stock trampling.

Site characteristics and terrain vary greatly and include gentle sloping alluvial floodplains, very steep riverbanks as well as bars and benches comprised of gravel, boulders and bedrock.

All of the above have had a bearing on the access for past clearing, past and current stock access and of course on present access for weed control. The Nymboida River is a complex river system and therefore every property and project site poses its own challenges for riparian management.

#### Landowner Riparian Observations and Management

Over the years landowners have observed the introduction and rapid increase in riparian weeds such as small leaf privet and camphor laurel.

Owners have experienced changes to their river banks from major flood events such as the recent 2001 floods. Whilst bank erosion has been relatively minor, destruction of vegetation, such as the snapping of river oaks, and large scale movements of sand and gravel have occurred.

Land owners down stream of the weir pool have reported noticeable improvement to water quality and fish activity since improvements in water extraction operations from the Nymboida River were implemented.

The past and current river bank management regimes of landholders include stock exclusion fencing and/or off stream watering points (dams), riparian planting and weed control. The rates of weed control vary greatly between properties ranging from none/ very little to very intensive weed management regimes. The weed control methods used include manual and mechanical control and a range of herbicide methods which include cutting & painting and spraying. The use of fire and heavy machinery are also used.

# The river's bank and bed is in very good condition



Photo from Fricker's- a river beaten bottle brush

.....every property and project site poses its own challenges for riparian management.



Photo Mc Alister's —snapped river oaks from 2001 flood

Owners have experienced changes to their river banks from major flood events ...

#### It is very unlikely that privet will ever be eradicated from the river system



Small leaf privet

... weeds that pose a serious future threat ... are Camphor Laurel, Cats Claw Creeper and Honey Locust



Thorns of the Honey Locust

#### Weeds

Many annual and perennial weeds are found in the riparian zone of the Nymboida River. See appendix X for a list of these.

The three weeds that tend to pose a serious future threat in the riparian zone of the Nymboida River are Camphor Laurel, Cats Claw Creeper and Honey Locust. With a planned and coordinated approach to the control of these weeds <u>now</u> (including diligent follow up work) there is potential to eradicate them from our local area. If these weeds are not addressed now they have the potential to continue to spread and multiply to a point of no return. (See appendix for examples of this in other areas)

*Camphor Laurel*— there are quite a number of large mature trees in Nymboida with the main infestations being down stream of the Bridge. There is a large number of smaller trees that are emerging and not yet evident.

*Cats Claw Creeper* has been rated as the worst weed on the North Coast and it is present on the Nymboida River, the infestations are relatively small and a priority to control before they get out of control.

*Honey Locust* too is a major threat with one large infestation recorded, this also is a priority to control.

*Small Leaf Privet* is a wide spread riparian weed with heavy infestations occurring from the head waters of the Nymboida River catchment to the lower reaches. It is very unlikely that privet will ever be eradicated from the river system however we can actively control and manage the weed to reduce the impact that it has.

*Lantana* is a wide spread weed however its impact on the riparian zone is considered less of a long term threat than the other weeds mentioned in this section.

#### Project Site Management—Stock & Weeds

Most landholders feel the priority was to have assistance with weed control, particularly small leaved privet, camphor laurel and cats claw creeper.

Some landowners already reduce stock access to the river with fencing, through paddock rotation and off stream watering.

Some landholders would like assistance with stock exclusion fencing, and watering troughs whilst for many properties fencing the river would prove difficult due to flood prone sites, the need for cattle to access water and the inability to undertake the weed control required once stock were removed. Land and Marine Management Service (LAMMS), experienced contractors in weed management provided site assessments, recommendations on weed control methods and cost estimates for most of the project sites. The cost estimates are an indication of what each project site would cost to employ contract bush regenerators to undertake the work. The amount of work that will be implemented will be dependent upon future funding availability and he amount of "inkind" work the landholder can undertake.

#### **Property Visit Observations.**

*Striking a balance between stock management and vegetation management.* 

Anecdotal evidence confirms that all of the river bank within the project area has had stock access for grazing in the past. The extent of weed infestations may relate to past clearing of native vegetation and to historical stocking rates. Present and past stocking rates vary greatly between properties.

Differences in privet infestations in some areas can only be explained by the fact that one side of the fence has stock and the other has not. Differences in other areas are explained by a combination of both active weed control and grazing compared to no weed control.

On many sites stock seem to control small leaf privet through the grazing of the seedlings. Stock also find new growth palatable and will continue to graze on some small privet bushes, hedging or creating "bonsai" trees therefore preventing individual plants from seeding. However stock grazing and trampling also reduce native ground cover and natural regeneration of native seedlings, cause increased nutrient loads and soil erosion on some sites.



A rocky well vegetated bank provides good protection for ground cover & understorey plants from stock.

The condition of the riparian vegetation varies greatly between sites. In some areas there is next to no privet compared to other sites the privet seems overwhelming. On the sites where mature privet dominates the canopy there is little to no natural regeneration of native species and where stock graze under this canopy in some cases there is no ground cover at all.

Native groundcovers and understorey do occur on grazed riverbanks however the amount and diversity vary between properties. Rocky banks and mature native multi-stemmed vegetation (eg. bottlebrush, tea tree and watergum) seem to provide some protection for these plants from stock trampling and grazing. Stock also find new growth palatable and will continue to graze on small privet bushes, hedging or creating "bonsai" trees...



Left side of fence weed control and grazed. Right side of fence stock excluded and no weed control. Note Privet



Stock grazed "bonsai" privet



100% Privet canopy and ground cover, stock have access to this area

# **Project Site Selection**

Project sites are the locations selected on individual properties to undertake planned rehabilitation work as part of the Nymboida River Project. This rehabilitation or "Landcare" work is outlined in each of the Property Site Plans to the rear of the document and may take a number of years to implement.

#### Site Location

The location of project sites per property were selected in consultation with the landowners considering the following factors:

- Most frequented river access (for recreation and water pumping)
- Riverbank previously worked on and current weed control work programs
- Sites of good native vegetation (using the principle of working with the best areas first.)
- Targeting specific weed infestation such as Cats Claw Creeper and Camphor Laurel Trees.
- Targeting areas of the riverbank that landholders need assistance with the initial "hit" of weed control.



Example of project site selection from map no. 6

#### Site Size and Length

The length of riverbank selected per property for the project site varied greatly and the factors used to assist with the determination included:

- Amount of work land holders have previously undertaken on their riverbank.
- The available time and other resources the landholder has to implement follow up work (this was very important)
- The degree of weed infestation. Generally the larger the sites the lower level of weed infestation to address.
- The methods of weed control that could be used on the particular site for example if the herbicide cut & paint method is used on heavy infestations only a relatively small area can be treated at a time.

One factor was most frequented river access for recreation and water pumping



Photo taken from McKenna's looking downstream

- Generally the larger the sites the lower level of weed infestation
- only relatively small areas of heavy weed infestations can be treated at a time



Photo of Marlin Blazejowski inspecting a Lily Pilly among the privet skeletons from a successful weed control spray.

# Nymboida River Project - Project Sites



# **Nymboida River Project - Project Sites**



Project Site Plans

The following section includes all of the individual property Project Site Plans for the whole of the Nymboida River Project area.

Two of the features of these plans that need explanation include :

**Estimated Cost contributed toward Riparian Management** - This section is an estimation of the amount of work that landowners have undertaken within their riparian zone since the ownership or management of their property. Their time is costed at \$20 an hour which is the recognized value per hour set by government funding agencies for Landcare type work. These figures are used only to give an indication of the amount of work and commitment landowners have toward the management of their riparian zones.

<u>Contract Bush Regeneration Cost Estimate</u> this is an estimate only of what the cost would be of employing contractors to undertake the work outlined per project site. These figures will be used to prepare future funding submissions.

#### **Table of Contents**

Property	Page No.
Borcherdt	
Maple & Wilson	
McAlister	
Rogers	
McLennan	
Kroll	
McKenna	
Police Station	
Cooper	
Coaching Station	
Blazejowski & Sulliva	n 38
Francis	
Filmer	
Achilles &	
Valuntas- Achilles	
Pender	
Bonney	
Sheraton	50
Broderick & Repschlag	ger 52
Campbell	
Nanto	
Patterson	
Fricker	60
Hull	
Cilia	64
Ellis	
Woodward	



# Property: Borcherdt

View upstream from this marked point

#### **Property Description**

A large remote property consisting of steep forested mountains and river escarpments giving way to cleared sloping grazing country and river flats. The whole property has a very well vegetated riparian zone of considerable width and diversity.

## Past and Current Riparian Management Activity

#### Weed Control

Target Weeds: Methods: Lantana and Small Leaf Privet Access Track for quad bike. Chainsaw cut privet, brush cut lantana and paint with herbicide.

#### Stock Management:

**Stock Exclusion Fencing:** 2-3 kms of riverbank for the past 2 years **Off Stream Stock Water:** provided 10 dams

#### Estimated Cost contributed toward Riparian Management

Off Stream Stock Water	\$8,000
Riparian Fencing	\$3,000
Labour—Weed Control & Fencing	
Landowner—"One working month per year"	
7 hrs x 5 days x 4 weeks @ \$ 20 x 10 years =	\$28,000
other labour 13 months	\$36,400
ГОТАL	\$75,400

#### Project Site Condition

Good Condition

#### Riparian Weeds of Concern Present

Cats Claw : No

Camphor Laurel : No

Small Leaf Privet: Yes

**Property Information** 

Property Size :	913 Ha	A
Approximate River		
Front Length:	13 Km	C.,.
Ownership :	10 yrs	

#### Property Use:

- Cattle Grazing
- Forestry
- Horses
- Stock History: 40-50 yrs

Kilometers

6

8

10

#### **Reasons for Site Selection**

Although the owner has undertaken a great deal of work on other areas of the riverbank little has been done on this site. Due to the good access to the rivers edge this is a favoured spot for camping in which the owner has had plans for some time to undertake weed control.

#### **Proximity to other involved Properties and Project Sites**

Strategically this is a good location for a project site considering the close proximity to McAlister and Rogers Site (see map x). The boundary fence is shared with McLennan who's river bank at this point is in relatively good condition.

#### **Project Site Description**

Approximate	Length :	
	Width:	
	Area:	

Area: 10,000 square metres The site extends from the down stream boundary fence upstream for approximately 200 metres and from the high bank down to a relatively flat bench at the rivers edge. The site is well vegetated with natives and interspersed with privet trees of varying sizes.

200m 50m

#### Access

Vehicle access to the property and site is 4wd. Access to the site by foot is relatively easy.



#### **Project Implementation Requirements (Consultant's Notes)**

**Project Site Description & Considerations** 

The site supports large privet near the rivers edge. Control include cutting by chainsaw and poison of stump. Access to the site is 4wd with a crossing of the Nymboida River. Damage to vehicle is probable particularly wheel bearings, brakes and electricals crossing the Nymboida with a low flow.

#### Control Method

Cut stump poison - Chainsaw. Back pack spray Brushoff small plants

#### **Contract Bush Regeneration Estimates**

Control Time Hours / Days	Labour	Materials & Equipment	Cost
3 people @ \$30hr x 32hrs/4days	\$2,880.00		\$2,880.0
		Travel	\$180.00
		Herb. 20lts	\$145.00
		Chainsaw x2	\$640.00
		Sub Total	\$3,845.00
		GST	\$384.50
		TOTAL	\$4,229.50



Good native vegetation on site

**Land Holder Contribution :** Landholders are aware of the requirement of contributing 'inkind' toward the project. The amount of inkind will be determined at the time of preparation of the Project Implementation Grant application is made when the exact amount of work that will be funded is determined.

## Nymboida River Project - Project Sites



# Property: Maple & Wilson

#### **Property Description**

A steep remote property extending from Black Mountain Rd down to the Nymboida River. The upper ridges give a spectacular view up stream toward "The Junction" and surrounding mountainous areas. The property vegetation is diverse with rainforest gullies and dry eucalypt forested upper slopes extending down into the Nymboida River riparian zone which is of considerable diversity.

#### Past and Current Riparian Management Activity <u>Weed Control</u>

Target Weeds:Lantana and Small Leaf PrivetMethods:Access foot tracks. Privet & Lantana cut & paintwith herbicide. Hand pull privet, lantana, senna and crofton weedStock Management:

#### No stock, state forest grazing cattle fenced out in 1994 **Estimated Cost contributed toward Riparian Management** Landowner: "Conservative estimate 5 days per month for 4 years" 7 hrs x 5 days x 12 months (a) $20 \times 4 \text{ years} =$ \$33.600 Landcare Work Bees: 3hrs x 5days x 12 people @ \$20= \$ 3,600 Contract Bush Regen: 7 hrs x ? Days x 3 people @ \$20= \$ 9,240 L/care follow up: 7 hrs x 2 days x12 mths x 5.5yrs x \$20=\$18,480 Green Corps: 5 hrs x 3 days x 6 months x 10 people= \$18,000 Owner inkind: 7 hrs x 3 days x 6 months @ \$20= \$ 2,520 1,000 plants @ \$1 per tube \$ 1,000 TOTAL \$86,440

#### Project Site Condition

Good Condition

#### **Riparian Weeds** of Concern Present

Cats Claw : No

Camphor Laurel : No

Small Leaf Privet: Yes

Property	Information

Property Size :	69 Ha	
Approximate River Front Length:	1 Km	and a
Ownership :	10 yrs	2
Property Use: • Residential		1. A.

Conservation
Stock History:
Access until 1994



View upstream from this marked point



Kilometers

6

8

4

# Nymboida River Project - Project Sites

# **Reasons for Site Selection**

The landowners have systematically been working along their river bank. This site is the next in line to tackle.

#### **Proximity to other involved Properties and Project Sites**

Although quite a distance from any other properties project sites. This site is opposite a very remote area of Borcherdts property. Given the amount of work the landowner has already undertaken on their riparian zone it is a logical choice.

#### **Project Site Description**

Approximate	Length :	200m
	Width:	10-20m
	Area:	3000 m2

The site is located upstream from the properties pump site so the area is frequented by either canoe access or via the walking Track. The site well vegetated with natives and interspersed with privet trees and lantana of varying sizes. There is no stock issue here and the need for planting is minimal to none.

#### Access

Vehicle access to the property is 4wd. Access to the site by foot is not easy via a 300m walk or a relatively straight forward canoe paddle.

#### <u>Project Implementation Requirements</u> (Consultant's Notes)

#### Project Site Description & Considerations

The site is heavily infested with many small privet stems. Control in this area would be slow and labour intensive. Many native plants mixed with privet no spraying. Access to the site is 4wd then walk 300m

*Control Method*—Cut stump poison - Chainsaw. Back pack spray Brushoff small plants

#### **Contract Bush Regeneration Estimate**

Control Time Hours / Days	Labour	Materials & Equipment	Cost
3 people @ \$30hr x 32hrs/3days	\$2,880.00		\$2,880.0
		Travel	\$180.00
		Herb. 12lts	\$84.00
		Chainsaw x2	\$60.00
		Sub Total	\$3,204.00
		GST	\$320.40
		TOTAL	\$3,524.40



°46'0"E



Good native vegetation on site



**Land Holder Contribution :** Landholders are aware of the requirement of contributing 'inkind' toward the project. The amount of inkind will be determined at the time of preparation of the Project Implementation Grant application is made when the exact amount of work that will be funded is determined.

# Planning Project Achievements to Date

It is important to take into consideration the achievements of this project that to date are not quantifiable (on ground). However these achievements are paramount to the success and value of this project and to the long term management and health of the Nymboida River. These include:

#### 1. Newcomers to formalised community Natural Resource Management

The involvement of a large number of properties, many of which are new comers to formalized natural resource management programs. Out of the 25 properties only 6 are currently involved in the Nymboida Landcare Group. Having said this the amount of "Landcare" type on ground work that has been done by many of these landowners has been great and to date unrecorded and funded entirely by the private landholder.

#### 2. Awareness of Regional Land Management Organisations

Increased Awareness of Landcare, the Northern Rivers Catchment Management Authority and related community funding mechanisms.

# 3. Identifying Landowner interest and commitment to Natural Resource Management.

Property visits for site selection were important in identifying the high level of interest and commitment people have in managing their riverbank and understanding the variation in land management techniques.

#### 4. The on ground education benefit.

There was a great deal of interest to know what the native plants were and for some even which were the weeds. I observed on a number of occasions damage to native vegetation that had been misidentified as weeds. Native plants such as Grey Myrtle and Lilly Pilly were commonly mistaken for small leaf privet

#### 5. Weed Management.

Information was shared both ways regarding varying weed control techniques

#### 6. Vision to expand the project.

#### On Ground Planning—'from little things big things grow'

For many properties it is only appropriate to start on a small scale as landowners ease into the new concept of external funding assistance on their property. Some project sites will increase in size, some may expand to incorporate off stream stock water and fencing. Some properties may wish to establish riparian management monitoring sites to assist in collecting information to assist in making

management decisions in the future.

#### Other properties joining the project

We already have an informal list of other landowners interested in becoming involved in the project in the future. If funding allows they will be included and other landowners will invited.

#### Long Term

The long term strategy of this project is to make contact with non private land managers/owners which may include Traveling Stock Routes, Crown Land, Council Reserves and Aboriginal Land.

...the amount of "Landcare" type work that has been done ...is great and to date unrecorded and funded entirely by the private landholder.



Photo taken from Woodward's looking down stream

We already have an informal list of other landowners interested in becoming involved in the project in the future



Photo taken at McKenna's looking upstream