

**NAMBUCCA
SHIRE
COUNCIL**

State of the
Environment
Report
2008/2009



Discover it, Live it

www.nambucca.nsw.gov.au

Our Vision

Nambucca Valley ~ Living at its best

Our Mission Statement

‘The Nambucca Valley will value and protect its natural environment, maintain its assets and infrastructure and develop opportunities for its people.’



© Nambucca Shire Council 2009

Nambucca Shire Council
PO Box 177
MACKSVILLE NSW 2447

Phone: 02 6568 2555
Fax: 02 6568 2201
e-mail: council@nambucca.nsw.gov.au

www.nambucca.nsw.gov.au

Table of Contents

TABLE OF CONTENTS	I
1.0 INTRODUCTION.....	1
1.1 WHAT IS A SoE REPORT?	1
1.2 TOWARD SUSTAINABILITY	1
1.3 INDICATORS THAT ARE USED HAVE MET THE FOLLOWING CRITERIA:	1
1.4 COMMUNITY VALUES	1
2.0 HUMAN SETTLEMENT	3
2.1 INTRODUCTION.....	3
2.2 PRESSURES ON OUR HUMAN SETTLEMENT	3
2.3 RESPONSE TO THESE PRESSURES	4
2.4 A SNAP SHOT OF 2008/09	6
3.0 LAND	9
3.1 INTRODUCTION.....	9
3.2 PRESSURES ON OUR LAND	9
3.3 RESPONSES TO THESE PRESSURES	12
3.4 SNAP SHOT OF 2008/09.....	15
4.0 AQUATIC SYSTEMS - WATER.....	23
4.1 INTRODUCTION.....	23
4.2 PRESSURES ON OUR AQUATIC SYSTEMS	23
4.3 RESPONSE TO THESE PRESSURES	27
4.4 A SNAP SHOT OF 2008/09	31
5.0 BIODIVERSITY	33
5.1 INTRODUCTION.....	33
5.2 PRESSURES ON OUR BIODIVERSITY	33
5.3 RESPONSES TO THESE PRESSURES	37
5.4 A SNAP SHOT OF 2008/09	42
6.0 ATMOSPHERE	49
6.1 INTRODUCTION.....	49
6.2 PRESSURES ON OUR ATMOSPHERE	49
6.3 RESPONSES TO THESE PRESSURES	51
6.4 A SNAP SHOT OF 2008/09	53
7.0 WASTE & RESOURCE RECOVERY	55
7.1 INTRODUCTION.....	55
7.2 PRESSURES ON OUR WASTE SYSTEMS	55
7.3 RESPONSES TO THESE PRESSURES	56
7.4 A SNAP SHOT OF 2008/09	58
8.0 NOISE	59
8.1 INTRODUCTION.....	59
8.2 PRESSURE ON OUR ENVIRONMENT FROM NOISE	59
8.3 RESPONSES TO THESE PRESSURES	60
9.0 ABORIGINAL & NON-ABORIGINAL HERITAGE	63
9.1 INTRODUCTION.....	63
9.2 PRESSURE ON OUR ABORIGINAL AND NON-ABORIGINAL HERITAGE.....	63
9.3 RESPONSES TO THESE PRESSURES	64
9.4 A SNAP SHOT OF 2008/09	65
10.0 GLOSSARY	69
11.0 REFERENCES	71



1.0 Introduction

This is the fifteenth consecutive State of the Environment Report (SoE) prepared by Nambucca Shire Council for the Nambucca Shire Local Government Area. The report covers the period from 1 July 2008 to 30 June 2009. Being a comprehensive SoE in 2009 it also includes trends since the last comprehensive SoE in 2004.

This report is a comprehensive document prepared in accordance with section 428(c) of the *Local Government Act 1993*. The first SoE report of a council for the year ending after each election of councillors must be a comprehensive SoE. As such a comprehensive report is required approximately once every four years.

This comprehensive report is an snap-shot of the eight environmental sectors: land, water, air, biodiversity, waste and resource recovery, noise, Aboriginal and non-Aboriginal heritage and human settlement.

1.1 WHAT IS A SoE REPORT?

A State of the Environment (SoE) Report summarises the physical and social attributes of the Nambucca Shire environment while identifying the human impacts on our local environment in a financial year. It also provides information on activities conducted by council and the community to protect and restore the Nambucca Shire environment, and is essentially a mechanism for reporting on progress towards environmental sustainability.

Comparing SoE reports from year to year enables Council to see improvements and identify areas that need attention in all sectors of the local environment. This then assists Council to further protect the health and diversity of the environment for the benefit of current and future generations.

1.2 TOWARD SUSTAINABILITY

In consultation with community, regional, state and national agencies 70 (22 regional & 48 Shire wide) environmental indicators were developed to best represent and measure Councils progress in these key areas year to year. This year 5 more environmental indicators were added so we can monitor Council's movement toward achieving sustainability goals.

The legend positioned below shows the negative, positive and no progress towards sustainability for each of the indicators displayed throughout the SoE.

There are *NSW North Coast Regional Indicators* that are outlined throughout this report. These are Nambucca Shires data that can be measured against the same indicators in other local government areas in the north coast region.

Key to Sustainability Indicators	
↑	Positive movement toward sustainability
↓	negative movement toward sustainability
↔	No progress toward sustainability
ND	Not determined

1.3 INDICATORS THAT ARE USED HAVE MET THE FOLLOWING CRITERIA:

- They reflect something fundamental to the long term economic, environmental or social health of the community;
- That they are statistically measurable – either the data exists or a practical method of data collection can be created;
- The indicator represents something that can be influenced by the community or government actions; and
- Are compatible with Council and community vision for Nambucca Shire.

1.4 COMMUNITY VALUES

Community consultation is an integral component of SoE reporting. To assist with the development of this years SoE report, Council conducted a Customer Satisfaction Survey in November 2007, and called for submissions from community groups in July 2009.

These findings will not only assist council with its reporting requirements but will also help Council to develop suitably targeted environmental programs for local residents.

The major issues identified by residents include:

- Estuary management
- Environmental monitoring
- Environmental protection
- Weed control
- Footpaths and cycleways
- Stormwater runoff/pollution
- River pollution
- Garbage and recycling
- Water supply
- Sealed roads
- Sustainable development, and
- Youth activities



2.0 Human Settlement

2.1 INTRODUCTION

Human settlements are in their own right, an environment, a human habitat, through their direct and indirect impacts on the physical environment. Therefore we must consider the internal environment and the settlements itself to deliver outcomes to its inhabitants, whilst minimising issues and problems that the settlement has on the physical environment.

Creating a sustainable community which meets the lifestyle needs of all existing and new members of the community requires careful planning so that accessible community services and facilities contribute to support Nambucca Shires social fabric. To achieve this Council must ensure planning processes and strategies continue to the maintenance and improvement of our social, natural and physical environments for everyone to enjoy.

The linkage between Environmentally Sustainable Development (ESD) principals and the social factors of the Nambucca Shire is important in relation to the environment of an area. The social and economic attributes of the Nambucca Shire population are linked to impacts that the population has on the environment and their understanding of, and participation in, environmental issues.

2.2 PRESSURES ON OUR HUMAN SETTLEMENT

- Increase in aging population
- Housing availability
- Lack of recreational facilities for young people
- Crime
- Community safety
- Mobility transport for senior citizens and the disabled
- Tourism

Table 2.1 Human Settlement Indicators

Human Settlement **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Predicted Population**	18 525	18 618	18 735	18 829	18 921	↔
Population*	17 807	17 897	17 986	18 076	18 203	↔
Population Density (persons/km ²)	11.9	11.98	12.04	12.1	12.2	↔
Growth Rate %*	0.5	0.5	0.5	0.5	0.7	↔
Unemployment Rate %	18.3	18.3	11.6	10.4	11.5	↔
% of residents in urban areas	no data	no data	no data	85.4	87.2	↔
Aboriginal and Torres Strait Islander %	5.4	5.4	5.7	6	6	↔
Non English speaking %	2.2	2.2	1.7	1.7	1.8	↔

* Denotes Regional Indicator ** Statistics from Australian Bureau of Statistics (ABS) www.abs.gov.au

Actual 2006 Census statistics

Predicted Population statistics from ABS that takes into account people who did not include themselves in the 2001 or 2006 census



Council supplies information for senior citizens.
Photo NSC



Senior Citizens with gophers
Photo ABC



Nambucca Valley Information Centre
Photo NSC

2.2.1 Increase in aging population

The median age of the Nambucca Shire in the 2006 census was 43 years, and current employment figures from DEEWR state that there is 7 311 people employed and 840 people unemployed in the Nambucca Shire. Figure 2.1 shows the age population of the Shire, the region and NSW in the 2006 census. The graph clearly shows that Nambucca has an older population than the average for the region and NSW.

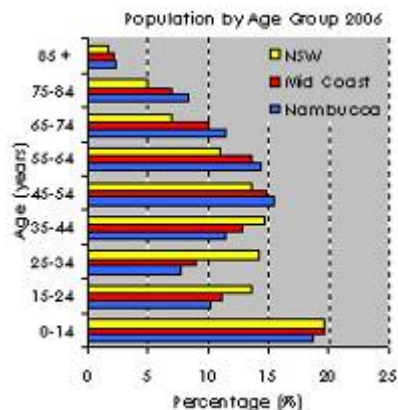


Figure 2.1 Population by Age group

This increase in the older population depicts the Nambucca Shire as an optimum retirement location, with many retirement developments and ventures.

2.2.2 Housing availability

The Shires growth rate increased by 0.2% in the last reporting year. This increase, though small, will still impact on the existing infrastructure and increase a demand for new housing.

2.2.3 Lack of recreational facilities for young people

Young people 0-14 yrs are still the highest percentage age group in the Nambucca Shire (Figure 2.1). In regional areas there is usually a lack of recreational facilities to keep this group focused.

An online Youth Survey in 2007 was designed to capture the views of residents aged 12-24, test assumptions about their behaviour, attitudes and interests, and gain ideas on how they would like to see the Shire progress. It was conducted as an online poll accessible through the Nambucca Shire Council website home page. The final report found that "bringing more entertainment options to the Shire" was their main priority, followed by "more job opportunities for youth" and the building of a skateboard park at Nambucca Heads. What they loved most about living in the Shire is the

beach culture, natural beauty, sense of community and friendliness.

2.2.4 Crime and community safety

Nambucca Shire has its share of crime, with the major centres of Macksville and Nambucca Heads particular hot-spots. (Table 2.2, pg 8)

Community safety is paramount as every citizen should feel safe to enjoy the place that they live in. Street crime and targeting of the elderly have made some parts of the Shire undesirable.

2.2.6 Mobility transport for senior citizens and the disabled

As we have noted in 2.3.1 Nambucca Shire has an aging population. The aged are much less mobile and therefore need a transport network to get to the shops, home and to medical care. The recent increase in use of 'gophers' has meant many of the shires elderly and disabled residents can now enjoy a seemingly effortless and independent way to get around.

Existing pathways are now not wide enough to accommodate some of these larger 'gophers' and pedestrians at the same time. Existing bike tracks are being well utilised by the mobile elderly.

Many of councils building and community centres have been upgraded to enable easier access.

2.2.7 Tourism

Visitors flock to the Shire to experience the magnificent emerald and turquoise waters of the Nambucca River. The tourist season peaks in summer and school holidays.

Whilst this is a major source of income to the Shire it also has a down side, the massive short term pressure on the environment, utilities and infrastructure.

Littering, disruption to beach habitats from 4WD's, overfishing, stress on sewage and septic systems, added vehicle noise and emissions, just to name a few.

2.3 RESPONSE TO THESE PRESSURES

2.3.1 Increase in aging population

Council supports two Senior Citizen Community Centres in Macksville and Nambucca that provide services and programs for the shires seniors

A community bus funded by HACC provides transport to and from the community centres on a regular basis.

2.3.2 Housing availability

See urban/rural development in Section 3 Land.

2.3.3 Lack of recreational facilities for young people

Council continued its **Resilient Young Peoples Program (RYPP)** in conjunction with Reconnect. RYPP is a 6-7 week program targeting young people in Years 8 or 9 at school. Information is given to young people participating, on: Relationships, Drugs & Alcohol, Sexual Health, Sexual Violence, Conflict Resolution, Bullying, Self Image and Mental Health.

The program is about harm minimisation. It has been running for 4 years in the 3 local high schools, Bowraville Central (Term 1), Macksville (Term 2) and Nambucca Heads (Term 3) and is a partnership between Council and Reconnect. The program is for up to 30 young people at each high school, who volunteer for the program. At the end of the program there is an all day excursion for the participants where they go to an activity, such as Nine Pin bowling, have a barbecue lunch and presentation of certificates and a bag of useful information given to them.

Guest speakers are invited to come and talk to the young people, eg Ted Noffs Foundation, Mental Health. Evaluations from the young people have been very favourable and feedback from the high schools is great. RYPP has been very successful in reaching young people who might not approach a service if they have a problem.

Hip Pocket Financial Education for Year 10 students from the 3 local high schools is a one day highly interactive and engaging financial education workshop facilitated by trained YWCA NSW staff and Mentors.

Hip Pocket is designed to challenge student's thinking about managing money and the many ways marketers target young people as consumers. Hip Pocket provides students with skills and tools that enable them to make informed decisions about their spending choices.

The workshop complements and support topics within the Stage 5 Commerce; English and Mathematics curricula of the Dept of Education and Training. The Mentors are volunteers, drawn from a broad range of business backgrounds in the local community, who support students with the workshop activities. In addition to

this, Mentors share their life and work experiences and emphasis the importance of managing money and expectations.

Council's Youth Service, in partnership with Headspace, Reconnect and TAFE NSW, have commenced the **Responsible Educated New Tenant (RENT)** program for young people 16-25 years old in the Nambucca Shire.

The RENT course is a community based initiative developed by Mid North Coast Community and Youth Housing Inc, Centacare Youth Services Port Macquarie and the North Coast Institute of TAFE and has been successfully running in the Hastings area for approximately 2 years and has been adapted for the Nambucca area.

The aim of the RENT course is to provide a free 3 day course which has been designed to target young people aged 16-25 years. Information developed is interactive, with youth friendly language, ensuring information is easily understood and absorbed by the target group. The outcomes of this program are to assist participants to gain long term accommodation in their local area through early intervention strategies.

The course has a maximum of 15 participants. Various business and organisations helped with the content of the course, including: Mitre 10 Macksville, Ray White Real Estate, Mid North Coast Tenants Advice Bureau, Anglicare Nambucca, Crisis Accommodation, Community Housing and Centrelink. Referrals for the course are received from Youth organisations, real estates, housing organisations or self referral. The RENT program will be run 3 times per year.

2.3.4 Crime and community safety

The Crime Prevention Plan 2008-2011, adopted by Council, was endorsed in November 2008 and can be found on Council's website.

Responding to complaints from residents and police, Council has taken a comprehensive approach to tackling alcohol-related crime and anti-social behaviour by establishing an Alcohol Free Zone (AFZ) from the 11 January 2008 through to 10 January 2011 in the CBD and other key areas of Nambucca Heads.

The AFZ has been implemented in order to help create a safer environment for residents, businesses and visitors.



Yr 9 RYPP participants from Bowraville Central School
Photo NSC



Participants joining in the auction at Hip Pocket
Photo NSC



R.E.N.T. participants doing the computer module of the workshop
Photo NSC



'Chill Out' Space at Macksville Show
Photo NSC



Youth Week Battle of the Bands
Photo NSC



Shared Pathway
Photo Google



Youth Week Photography Competition
Photo NSC



Youth Week Writing Competition
Photo NSC

It is an offence to drink alcohol on any street or footpath where an AFZ exists, 24 hours a day, seven days a week whilst the AFZ is in place.

Alcohol Free Zones only apply to streets and footpaths where indicated by signage. Alcohol Free Zones do not apply to parks.

An AFZ was established in Bowraville early 2009

Cameras have been installed in the Tourist Information office in Nambucca Heads for added security.

5 new street lights were added to Bent Street, Loftus Street and Main Beach at Nambucca Heads to increase safety for both beach users and motorists.

2.3.6 Mobility transport for senior citizens and the disabled

Council's Disability Action Plan 2001 was revised and amended in March 2008 and adopted in May 2009.

The Bellwood to the Stuart Island causeway boardwalk was opened in July 2008, this board walk was made extra wide to accommodate cyclists, 'gophers', walkers and fishes, more information about the boardwalk in section 5 (Biodiversity).

Valla Hall was refurbished and Grants Hall in Bowraville was given extensive refurbishment to allow for continued use for indoor sports, youth activities and access..

2.3.7 Tourism

The Nambucca Rivers User Group produced a boat users pamphlet for last summer. This pamphlet was handed out to boat owners, tourist accommodation, shops and fishing shops in a effort to reduce the degradation of the waterways.

Increased patrolling of 4WD's on beaches caught many vehicles without permits.

DPI Fisheries Officers patrolled fishing spots as did NSW Maritime patrol the river.

2.4 A SNAP SHOT OF 2008/09

- Council continues to host the 'Tree of Life' a community project to celebrate new beginnings and past roots for our multicultural community. This tree is displayed in the Council Administration building foyer.
- 14 people became Australian Citizens during the reporting year.
- Nambucca Shire boasts 20

community committees.

- Seniors Week 15-22 March 2009 celebrated with intergenerational activities in partnership with Nambucca Heads schools.
- Youth Week 2009 commenced with the opening of the Art/Photography/Literature competition which attracted approximately 70 entries. This was the official Launch of Youth Week 2009 with an afternoon tea which attracted approximately 30 young people and parents. Other activities included 2 Radio Training workshops at 2NVR with a total of 20 young people attending both; Battle of the Bands with 6 local young bands battling it out for some great prizes and approximately 200 young people in attendance.
- Nambucca Shire's libraries are part of the Clarence Regional Library Network. During the reporting year the 10 year strategic plan for the library network was finalised.

Information technology was upgraded at the main libraries to allow the community to access the world wide web.

The libraries continue to provide activities for children and youths, such as story-time for children and hosting the youth week photography competition.

- A Chill Out Space was organised for young people 12-25 years at the Macksville Show. The Chill Out Space operated from 5 pm – 9 pm with free activities, information and water available to young people and was set up under a marquee. Activities were beading, hair wraps, temporary hair colouring and painting on a large canvas. Approximately 130 young people came to the Chill Out Space and joined in the activities during the night. Most of the time there were approximately 20 young people in attendance, socialising, beading, getting a hair wrap, getting their hair coloured and talking to the workers and volunteers. There were 30 door prizes given on the night, ranging from backpacks, surprise bags and movie tickets.
- A Customer Satisfaction Survey was conducted in November 2007 and the final report released in December 2007. This survey was designed to help Nambucca Shire Councillors and Management understand the local communities satisfaction towards, and

importance of Council-run facilities and services. Goals included assisting Council plan future service priorities and allowing it to benchmark customer satisfaction for internal management purposes.

- Council in partnership with Mid North Coast Regional Council for Social Development, and the youth services sector, organised a youth forum to gain feedback from young people about issues that affect their lives, particularly in relation to education and employment, health and safety, and participation and decision making.

The young people's feedback will be communicated to relevant government bodies and services, so that appropriate responses can be developed. The consultations will provide a basis from which improvements can be made. The Mid North Coast Regional Council for Social Development, together with the Nambucca Shire Council and Reconnect spoke with over 30 young people at Scotts Head.

The group was led by 4 youth leaders who assisted their peers to reflect upon life in the Nambucca Shire and the needs of young people. Students from the 3 high schools were in attendance, also young people not in school. Group leaders from the participants were chosen to facilitate the 4 groups.

Strategies that were talked about in each group, were on the following topics: Education and Employment; Health; Safety; Participation and Decision Making. Some great ideas were put on butcher's paper and the participants got very involved

- Council continued with its School Holiday Activities program.
 - October 2008 attracted over 170 young people attended various School Holiday Activities during the September/October holidays. The activities included: Sports

fun day at Kempsey Squash Centre with a BBQ lunch; Journey to the Centre of the Earth movie session with drink and popcorn; Surf School at Scotts Head with morning tea and a bbq lunch; Nambucca Indoor & Aquatic Centre Nambucca Heads with morning tea and bbq lunch; Butterfly House Coffs Harbour with morning tea and lunch; Bongil Bongil NP, Coffs Harbour, canoeing and a bush tucker walk/tour of the national park with morning tea and lunch..

- January 2009 attracted over 200 young people for various School Holiday Activities during the January holidays. The activities included: 2 Health and Beauty workshops, this included having a doctor in attendance, pamper treatments, make up and massage with a Thai lunch; Canoeing in Bellingen with morning tea and lunch supplied; Horse Riding at Valery Trails with morning tea and lunch supplied; Pool party which included volleyball, 3 on 3 basketball, wrestling beam and waterslide with morning tea and lunch supplied; Hotel for Dogs movie session with drink and popcorn supplied.
- April 2009 attracted Over 200 young people attended various School Holiday Activities during the January holidays. The activities included: 2 Health and Beauty workshops, this included having a doctor in attendance, pamper treatments, make up and massage with a Thai lunch; Canoeing in Bellingen with morning tea and lunch supplied; Horse Riding at Valery Trails with morning tea and lunch supplied; Pool party which included volleyball, 3 on 3 basketball, wrestling beam and waterslide with morning tea and lunch supplied; Hotel for Dogs movie session with drink and popcorn supplied.



Canoeing in Bellingen
Photo NSC



Slide at The Big Banana, Coffs Hbr
Photo NSC



Surf School at Scotts Head
Photo NSC



Canoeing at Bongil Bongil NP
Photo NSC

Table 2.2 Suggested causes of crime in Nambucca Shire

	Alcohol/Drug Use	Unemployment	Lack of Community Events/Venues for Youth	Not Enough Police Presence	Environmental Design	Lack of Opportunity	Poor Parenting	Non-attendance at School	Financial Stresses	Other
Location	%	%	%	%	%	%	%	%	%	%
Macksville CBD	26.4	23.6	8.1	3.4	2.0	2.0	1.4	0.7	0.7	0
Macksville Industrial Estate	9.5	9.5	1.4	0.7	2.7	0	0.7	0	0	1.4
Nambucca Heads CBD	23.6	18.2	4.1	2.0	1.4	2.7	1.4	0	0.7	4.1
Nambucca Heads Industrial Estate	9.5	9.5	2.7	1.4	0	0	0	0	0	0
Nambucca Plaza	4.7	3.4	2.7	1.4	0	0	0	0	0	0
Bowraville	5.4	4.7	1.4	2.0	0.7	0.7	2.0	1.4	0.7	1.4
Not Specified	2.7	2.0	0	0	0	0	0	0	0	0.7
Total	81.8%	70.9%	20.4%	10.9%	6.8%	5.4%	5.5%	2.1%	2.1%	7.6%

Source: Nambucca Shire Council Crime Prevention Plan 2008-2011

3.0 Land

3.1 INTRODUCTION

The Nambucca Shire Local Government Area (LGA) is located between Kempsey and Bellingen Shire Councils on the Mid North Coast of NSW, approximately 500km north of Sydney and 480km south of Brisbane. The shire is 1492.8 km² and is situated between 30°30'S and 30°56'S and 152°18'E and 153°01'E. The terrain is steep intersected by small streams nestled between the foothills of the Great Dividing Range and the coastline of the Pacific Ocean. The rugged topography of the eastern edge of the New England plateau in the western part of the Shire is dominated by steep slopes and valleys, while the eastern portion of the Shire is characterised by the gentle slopes of the river floodplains. The Nambucca River drains the shire and is 47km long.

The Nambucca Shire is a highly modified environment altered from its natural state by human occupation resulting in the replacement of native bushland with agricultural lands and urban development (Figure 3.1) and in cases the exposure of soils to erosion.

The geology of the Shire is dominated by slate, phyllite, schistose

sandstone, schistose conglomerate and basic volcanics. Isolated outcrops of tertiary basalts, minor trachyte and dolerite occur at the headwaters of the Nambucca River. The remaining areas are generally alluvial, paludal and estuarine deposits consisting of sands, silts and gravels (Baker *et al* 1993) Figures 3.2 & 3.3 show the river and estuarine deposits in the Nambucca River and Deep Creek.

Soils within the Shire consist mainly of lithosols and podzolics derived from the slates, phyllites, sandstones and conglomerates. Alluvial and estuarine soils are present in the valley and floodplains (Baker *et al* 1993).

The main localities of the Shire include Nambucca Heads, Macksville, Bowraville, Valla Beach and Scotts Head with many smaller villages and rural settlements. The Shire has a population density of 12.2 people per km².

Since the 1830's an increase in agriculture, logging and population has brought with it extensive land degradation in the floodplain and coastal zones from adverse impacts such as land clearing, destruction of native vegetation, wetlands and introduction of exotic weed species,

erosion and increased urban and agricultural runoff.

In response to these pressures Council continues to develop environmental strategies within planning documents, policies and environmental planning instruments that will ensure these impacts are minimised and the state of our environment is preserved for present and future generations.

3.2 PRESSURES ON OUR LAND

- Urban development
- Rural residential development
- Agriculture
- Extractive industry
- Forestry
- Human use of coastal and estuarine foreshores
- Land degradation
- Contaminated sites
- Shoreline and river bank erosion
- Storm and flood damage

Tables 3.1 & 3.2 Land and Forestry Indicators

Land Indicators **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
per capita of open green space (ha)	no data	no data	no data	0.022	0.022	ND
Number of Development Applications submitted	512	321	305	301	233	↔
Number of Development Applications Approved by Council	no data	no data	289	291	209	↔
Potentially Contaminated Land Sites	18	18	18	18	18	↔
Land Pollution Complaints	no data	no data	no data	no data	8	ND
Population Density (persons/km2) ***	11.86	11.86	11.98	12.61	12.67	↔

** Statistics from Councils Environment and Planning Department *** Statistics from ABS

Forestry Indicators **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Area of LGA occupied by State Forest (ha)*	28 156	28 156	28 088	28 088	28 088	↔
% of LGA occupied by State Forest*	18.9	18.9	18.8	18.8	18.8	↔
Native Forest protected on State Forest land in LGA (ha)*	205	405	no data	120	8 415	↑
Area of State Forest selectively logged (ha)*	122	410	800	811	377	↑
Non-dedicated State Forest land (ha)*	260	260	260	260	930	↑

* Denotes Regional Indicator ** Statistics from State Forests NSW



Urban Development
Photo NSC



Urban Development
Photo NSC



Agricultural Land
Photo NSC



Alpaca and Goat Grazing
Photo Google

3.2.1 Urban/rural residential development

Clearing, disturbance of soils, the expansion of urban/rural residential areas and additional development has affected the condition of the Shires land in the last 5 years.

Recent history has seen an increased demand for rural-residential development and a consequent increase in the area of land allocated for this purpose. In the reporting year 67 new lots have been created, via subdivision, for urban or rural residential development.

Council has approximately 70 km² of land zoned for rural-residential subdivision (LEP 1995 maps). Land zoned for rural-residential development varies substantially with regard to its natural state and suitability for certain types or densities of development.

As the population of the Local Government Area increases, the need for development to provide for this increase must be met. This can lead to both short and long term environmental pressure. Problems associated with development growth include erosion of construction sites and subsequent sedimentation, the loss of significant native vegetation, habitat areas and productive rural lands, and increases in land, water and air pollution.

The cost of providing additional physical, social and environmental services to new land release areas is another factor that must be considered when releasing urban and non-urban land for future development.

The Cow/Boggy Creek locality has been identified as a future urban land release area. This area has the potential to meet the longer term demands for additional residential land.

The provision of new urban land requires a substantial lead time in providing adequate servicing for new areas by way of roads and stormwater, water supply and sewer infrastructure. Community facilities also need to be provided to ensure that areas are attractive and suitable for growth.

3.2.1 Agriculture

Agricultural use of rural lands throughout the Shire is varied in terms of the value of products generated, number of producers and areas of land used for different types of production. Most agricultural land

within the Shire is utilised for livestock and dairy production. Therefore the state of rural lands is likely to be strongly influenced by the acceptability of farming practices associated with these forms of agriculture. Figure 3.6

Most agricultural pursuits in the Shire rely on the presence and continued health of rivers and floodplains. Rivers provide water for irrigation and stock watering whilst floodplains provide areas for crops or pastures to grow.

There are a number of impacts that may potentially arise from agricultural activities including the loss of native vegetation, erosion, land contamination (e.g. from banana spraying) and pollution. The amount of pressure exerted upon the natural environment by agriculture is dependent upon the duration, intensity, nature and scale of the operations. These will ultimately depend upon environmental factors, economic factors (e.g. demand for produce and production costs) and accessibility of markets.

In some respects it may be considered that the pressure exerted upon rural lands in the Shire by agriculture has reduced over time.

An increase in the level of education regarding environmentally responsible farming techniques and restrictions imposed by various levels of Government may have also assisted in reducing the pressure from agricultural operations on the environment. Whilst these factors may ultimately reduce the pressure from agriculture, the continuation of certain farming techniques is likely to contribute to the activity that is still exerting a relatively high degree of pressure on the rural environment.

3.2.2 Extractive industry

There is potential for unsuitable gravel extraction operations to adversely impact upon the environment. The Nambucca Valley River and Catchment Management Study (Lyll & Macoun Consulting Engineers, 1999) suggests that the inappropriate extraction of river bed gravel has contributed to the relatively degraded state of the Nambucca River system. It also notes that most of the gravel within river beds has been scoured from erosion of the adjacent floodplain. This emphasizes the importance of viewing the river and floodplain as components of an overall functional system. Hence careful consideration of any future proposals for floodplain extraction is

required. There are no longer any river bed gravel extraction operations in the Local Government Area. State environmental controls are such that it is unlikely that new river bed gravel extraction operations will eventuate.

Extractive industries provide construction materials and various rock products to specification for activities including roadworks, foreshore protection, concrete production and construction. Extractive industries usually incorporate extraction, storage, some form of on-site processing and transportation of materials from the extraction site. Due to the nature of these activities there is potential for adverse environmental impact in terms of vegetation removal, production of wastes, release of contaminants into the air and water, disruption caused by noise, increased traffic and visual pollution.

The degree of pressure exerted upon local extractive resources will depend largely on the demand for materials and the availability of deposits. Assuming that the local construction industry will source local materials, an indication of the likely pressure that will be placed upon extractive resources may lie in figures for building approvals and road construction. It is expected that an increased degree of pressure will be placed upon extraction of floodplain gravel deposits to replace river based deposits. The (former) Department of Land and Water Conservation released strict guidelines relating to the extraction from floodplain localities. It is expected that floodplain extraction will become increasingly difficult in the future due to community opposition and Government Policy.

3.2.3 Forestry

Forestry activities undertaken within the Nambucca Valley includes forestry operations undertaken on private land or forestry operations undertaken on State Forest land. Private forestry operations are generally required to gain consent from the Northern Rivers Catchment Management Authority (NRCMA), under the provisions of the *Native Vegetation Conservation Act 2003*, while Forests NSW oversee operations undertaken on State Forest land. Clearing for the purposes of agriculture or forestry is generally permitted without consent in most Rural zones within the Shire, however consent for clearing is required by Council in those rural zones where significant vegetation, wildlife habitat

and steep slopes have been identified. Consent for clearing is otherwise required from Northern Rivers Catchment Management Authority under the *Native Vegetation Conservation Act 2003*.

Removal of vegetation for forestry purposes has the potential to create various adverse environmental impacts. The degree of pressure exerted upon State Forests is primarily a function of harvesting plans formulated by Forests NSW. There is often conflict between relevant parties regarding the conservation status of areas designated for logging and protection.

3.2.4 Human use of coastal and estuarine foreshores

The coastline of the Nambucca Shire is approximately 25 km in length and runs roughly north to south. The coastline consists of various environments including exposed beaches and dune systems, headlands and associated rock platforms, river mouths and intermittently closed/open lakes and lagoons (ICOLLS).

Coastline areas including beaches, rocky intertidal platforms, estuaries and lagoons provide great aesthetic and recreational opportunities for the Shires residents and tourists

The coastal zone is an area of extreme environmental sensitivity and is of major economic importance to the Local Government Area. Many people visit the local area each year to enjoy the beaches and associated environments.

The coast is also of major importance to short and long term residents. The beaches and associated areas are all highly sensitive to human impacts, with many of the popular beaches experiencing high usage during the warmer months. This may result in loss of native vegetation, destabilization of the dune system and invasion of weed species.

The increasing importance of tourism in the Shire and on the North Coast as a whole is exerting pressure on fragile coastal ecosystems. These ecosystems have evolved to endure extreme erosion and degradational events such as storms and floods, however they are unable to contend with constant and uncontrolled use that is typical of popular tourist beaches. The introduction and widespread increase of many weed species exerts additional pressure on the natural ecosystems.



Quarrying
Photo NSC



Dam Building
Photo NSC



Forestry
Photo Forestry NSW



4WD on Beach
Photo NSC



Contaminated Land
Photo NSC



Erosion at Bellby's Beach
Photo NSC



Shelly Beach Boat Ramp
Photo NSC



Storm Erosion of the Foredune
Photo Google

3.2.5 Land degradation

Since the first period of European settlement in the Nambucca Valley, there has been a long history of modifying rural land resources for agriculture, forestry, mining and other purposes. Modification has involved practices such as the clearing of native vegetation, the introduction of exotic species of flora and fauna (eg crops and cattle) and the removal of extractive material from floodplains and river beds.

3.2.5 Contaminated sites

Contaminated land may be due to previous use of a site or land adjacent to the site. This may have been caused by poor practice in the use, handling and/or disposal of hazardous material, or could simply be an unfortunate by-product of the nature of that use. Some contaminated sites present a significant risk to human health and the environment. The nature of site contamination is determined by the history of landuse, production technology and waste management practices.

There is current concern regarding the existence of potentially contaminated or contaminated land within the Local Government Area. Under current legislative and administrative arrangements, Local Councils assume much of the responsibility for the management of contaminated land. Investigations have revealed that there are at least seventeen known potentially contaminated sites within the Shire. These sites are presented in Table 3.3. and Figure 3.4, pages 16 & 18.

A number of other sites within the Local Government Area have the potential to contain substantial levels of contamination however they require further investigations before their status can be determined.

There are a number of sites within the Local Government Area where it is suspected that potentially contaminating activities have occurred. These sites and contaminants include:

- Agricultural areas where persistent chemicals such as arsenic and or organochlorine chemicals (eg banana plantations, local orchards, horticultural plantations and market gardens) and organophosphate based chemicals have been applied.
- Landfills and other waste disposal and storage areas including transfer stations, where putrescible material (eg food waste), paper,

plastics, metals and liquid wastes (eg solvents) have been disposed of.

- Petroleum storage areas and petrol stations with aboveground and underground storage tanks.
- Pesticide storage tanks and areas where vehicles used for transport and storage of pesticides are washed.
- Scrap yards where heavy metals and chlorinated hydrocarbon solvents have been disposed of.
- Stock dipping sites where chemicals such as arsenic, DDT and BHC were previously used and where current chemicals such as Tactic and Amitraz are in use.

3.2.6 Shoreline and river bank erosion

Pressure is also exerted on the coastal environment through natural events such as floods and storms. Consideration must be given to the possible loss of life and property during such events. Dune systems are often the last line of defence between the destructive forces of storm events and fragile ecosystems or property.

Climate change and sea level rise are two important issues all Coastal Councils must address. The increased storm frequency and intensity will further erode the current shore line and river banks in the near future.

3.2.7 Storm and flood damage

Climate change is expected to impact on the Shires coastal foreshores with predicted sea level rise and a wide range of potential coastal impacts including beach erosion, long term shore line recession and coastal inundation into the future.

Increased storm intensity and frequency will also affect the shires drainage systems and receiving environments, rivers, creeks etc, through increased potential for flooding and pollution.

3.3 RESPONSES TO THESE PRESSURES

3.3.1 Urban/rural residential development

Council has stipulated strict criteria for the assessment of rural-residential development applications. The criteria ensure that each rural-residential subdivision meets strict environmental guidelines to make sure that there is an acceptable impact on the environment.

These criteria include consideration of

issues such as flora and fauna, on-site effluent disposal, drainage, aquatic environment, vegetation conservation, bushfires and impact on the scenic qualities of the landscape. Additionally, all developments are required to contribute towards upgrading Council's public road system and pay Section 94 contributions towards public reserves, community facilities and surf lifesaving equipment.

Council has adopted a user pay system whereby the developer, and not the community, pays towards providing and upgrading facilities and services for new rural-residential development.

The State Government now requires Council to approve and regularly inspect all On-site Sewage Management Systems (OSMS) throughout the Shire. The primary purpose of this requirement is to consider health, vector and impacts on all aspects of the natural and built environment. These inspections will be ongoing to ensure that all OSMS are functioning properly so as to reduce environmental impacts on waterways, groundwater, soils and risks to public health.

Council specifies that all new applications for dwellings in areas not connected to Council's sewerage system must include a report from a geotechnical consultant that attests to the suitability of the system to receive effluent generated by the proposal. Applications for relevant rural-residential subdivisions are also required to include a geotechnical report that demonstrates the ability of the proposed lots to dispose of effluent in accordance with Council's adopted On-Site Sewage Management Plan. Conditions of development consent require any future effluent disposal to be in accordance with the recommendations in this report.

3.3.2 Agriculture

Agriculture is an activity that does not generally require Council consent, therefore Council has not formulated specific policies to control agriculture through the development consent process. One exception to this however, is Council's formulation of a Local Environmental Plan to provide controls in the management of acid sulphate soils. Supported by a Development Control Plan, the aims of this plan are to:

- Provide environmental planning controls that will result in the management of any disturbance to acid sulphate soils in the Nambucca Local Government Area so as to minimise impacts on natural

waterbodies and on agricultural, fishing, aquaculture, urban and infrastructure activities;

- Obtain development consent for the works, including some agriculture related works, that would disturb soils or groundwater levels in localities identified as having acid sulphate soils; and,
- Provide special assessment of certain development on land identified as being subject to risks associated with the disturbance of acid sulphate soils.

Land affected by acid sulphate soils and risk categories are presented in Figure 3.5, pg 19.

Another activity intended to reduce adverse impacts of agriculture on rural lands is the fencing off of vulnerable or sensitive areas. The issues of riparian corridor management, fencing off and revegetation of stream banks were raised during a recent community consultation program. While Council supports and encourages fencing off and revegetation of stream banks, much responsibility must fall upon individual landholders to undertake such activities. Also see section 3.4.

3.3.3 Extractive industry

Mining and extractive industry within the Nambucca Shire is a contentious issue, with community groups often having differing opinions. Assessment and management of extractive industries is an intricate process generally involving many conflicting issues. As a resource manager, Council has to carefully balance development and environmental protection. This balance is determined at the environmental assessment stage by Council and a number of other Government Agencies, under a number of legislative controls including the *Environmental Planning and Assessment Act 1979*, the *Protection of the Environment Operations Act 1997* and the *Threatened Species Conservation Act 1995*.

In addition to these controls, guidelines for the preparation and review of environmental impact statements (EIS) for floodplain gravel extractive industries were formulated by the (former) Department of Land and Water Conservation. The guidelines state that the EIS must contain a complete hydrological study, a fluvial geomorphology study, an erosion & sediment control plan, a rehabilitation plan and monitoring proposals. Council will continue to assess each application on its individual merit, having regard to the findings of the Nambucca Valley



Rural Dump, potentially contaminated land
Photo NSC



Cattle Grazing
Photo Google



Gumma Gumma Swamp, Source of ASS
Photo B Redman



Storm and Erosion at Valla Beach
Photo M Bryen



Forestry
Photo Google



River Usage
Photo Google



Acid Sulfate Scald
Photo OzCoasts



Land Slip on Riverside Drive
Photo M Bryen

River and Catchment Study (Lyll & Macoun Consulting Engineers, 1999), specialist reports prepared in support of the application, comments received from relevant Government Departments and submissions made by members of the public.

Monitoring and reporting in relation to the performance of the majority of operations is based on an approved management plan that requires continued environmental impact assessment addressing site specific requirements. Certain operations commenced extraction prior to current environmental assessment procedures being imposed. All operators however, are subject to regular inspections by Council, the Department of Environment and Conservation and the Department of Infrastructure, Planning and Natural Resources to ensure compliance with operating procedures, development approvals and environmental legislation.

3.3.4 Forestry

Forests NSW controls State Forests and its main function is forestry and conservation.

DECCW controls protected areas such as National Parks and Reserves and is the appropriate authority for the destruction of native vegetation. They are also the issuing authority for permits for private land forestry.

3.3.5 Human use of coastal and estuarine foreshores

Council currently operates a policy that allows vehicles on certain beach areas within the Shire, subject to the vehicle owners obtaining a Beach Driving Permit. It is difficult to quantify the pressure exerted upon the coastal environment from these permits given the following:

- some drivers use the beach more than others;
- drivers will avoid the prohibited and restricted areas to varying degrees and
- permits issued in the Kempsey and Hastings Shires also allow access to beaches in the Nambucca Shire

Regardless, a comparison of permits issued annually may provide an indication of the trend in four wheel drive vehicle use and the potential for degradation from this source.

3.3.6 Land degradation

Through grants and funding, Nambucca Valley Landcare Inc, oversees many projects to help with land degradation in the Nambucca Shire. Projects include, bank stability, major erosion control.

Some significant projects are listed in Section 3.4 and 5.4 (Biodiversity).

3.3.7 Contaminated sites

Pursuant to State Environmental Planning Policy 55 – Remediation of Land (SEPP 55), Council cannot consent to any development unless potential land contamination has been considered. Council specifies that the Potential Land Contamination Checklist for Initial Evaluation must be completed and accompany all Development Applications.

Council has instigated the following four broad strategies when addressing the issue of potentially contaminated or contaminated land:

- **Site identification** - This encompasses the identification of potentially contaminated sites including the nature and extent of contamination, registration of sites and contaminants and or contaminated areas.
- **Prevention measures** – By encompassing land-use planning policies to restrict potentially contaminating activities or development to areas where such developments can be undertaken within accepted community standards.
- **Impact minimisation** – The formulation and imposition of restrictions and limitations on potentially contaminating developments, to minimise adverse environmental impacts.
- **Remediation measures** – The removal, dispersion, destruction or mitigation of contaminated sites.

Council adopted a Contaminated Land Management Policy on 18th November 1999. This policy forms the basis for the management of land contamination within the Local Government Area. It is made as a policy under the *Managing Land Contamination: Planning Guidelines* (August 1998) and SEPP 55. In accordance with the *Managing Land Contamination: Planning Guidelines*, the policy provides the framework for the integration of land contamination management into the planning and development process and aims to:

- ensure that changes of landuse will not increase the risk to health or the environment;
- avoid inappropriate restrictions on landuse; and,
- provide information to support decision making and to inform the community.

The Department of Environment, Climate Change and Water's intervention in relation to contaminated

land is triggered when land contamination poses a significant risk of harm to public health or the environment (Section 7 *Contaminated Land Management Act 1997*). In general, sites that do not present a significant risk of harm will be dealt with by Council under the provisions of the Environmental Planning and Assessment Act 1979, in accordance with *Managing Land Contamination: Planning Guidelines* and SEPP 55.

3.3.8 Shoreline and river bank erosion

Through its Floodplain Management Committee, Council is in the process of preparing a Floodplain Management Plan in accordance with the NSW Government Flood Policy to identify existing flood problems and solutions to ensure new development is compatible with flood hazard.

There are also two Dunecare groups currently operating on the Nambucca Shire's coastline. These groups are based in Valla Beach and Scotts Head. The work undertaken has also contributed to a wider community awareness and understanding of importance of urban habitat.

Council must consider the provisions of the NSW Coastal Policy when preparing plans and assessing Development Applications. State Environmental Planning Policy No. 71 – Coastal Protection also requires consideration by Council when preparing new plans and assessing development applications that relate to the NSW Coastal Zone.

3.3.9 Storm and flood damage

Council adopted in April 2009 a predicted sea level rise of 40 cm by 2050 and 90 cm by 2100 for all land-use planning and infrastructure design and investment.

These rises are based upon CSIRO reports and inter-governmental panel on climate change.

Stage 1 of the Coastal Processes Study was underway in the reporting year with the Coastal Hazard Definition final report due September 2009.

3.4 SNAP SHOT OF 2008/09

- Nambucca Valley Landcare received approx \$300,000 in funding in the reporting year aimed at projects dealing with regeneration and education for the Nambucca valley, Projects included:
 - Newee Creek Reach Plan completed year 2 - 9 km river protection fencing,
 - Upper Taylors Arm Reach Plan completed stage 3 – 2 km of new fencing with water points and began stage 4
 - Small grants for landowners for bank erosion and riverbank restoration in North Arm, Taylors Arm, Deep Creek
- Other projects can be found at <http://www.nvlandcare.org.au/pages/preprojects.html>
- Other projects that were completed or initiated are listed in section 5.4 Biodiversity



Acid Sulfate Soils
Photo NSC



Agricultural Grass
Photo Google



Storm Scarp at Valla Beach
Photo NSC



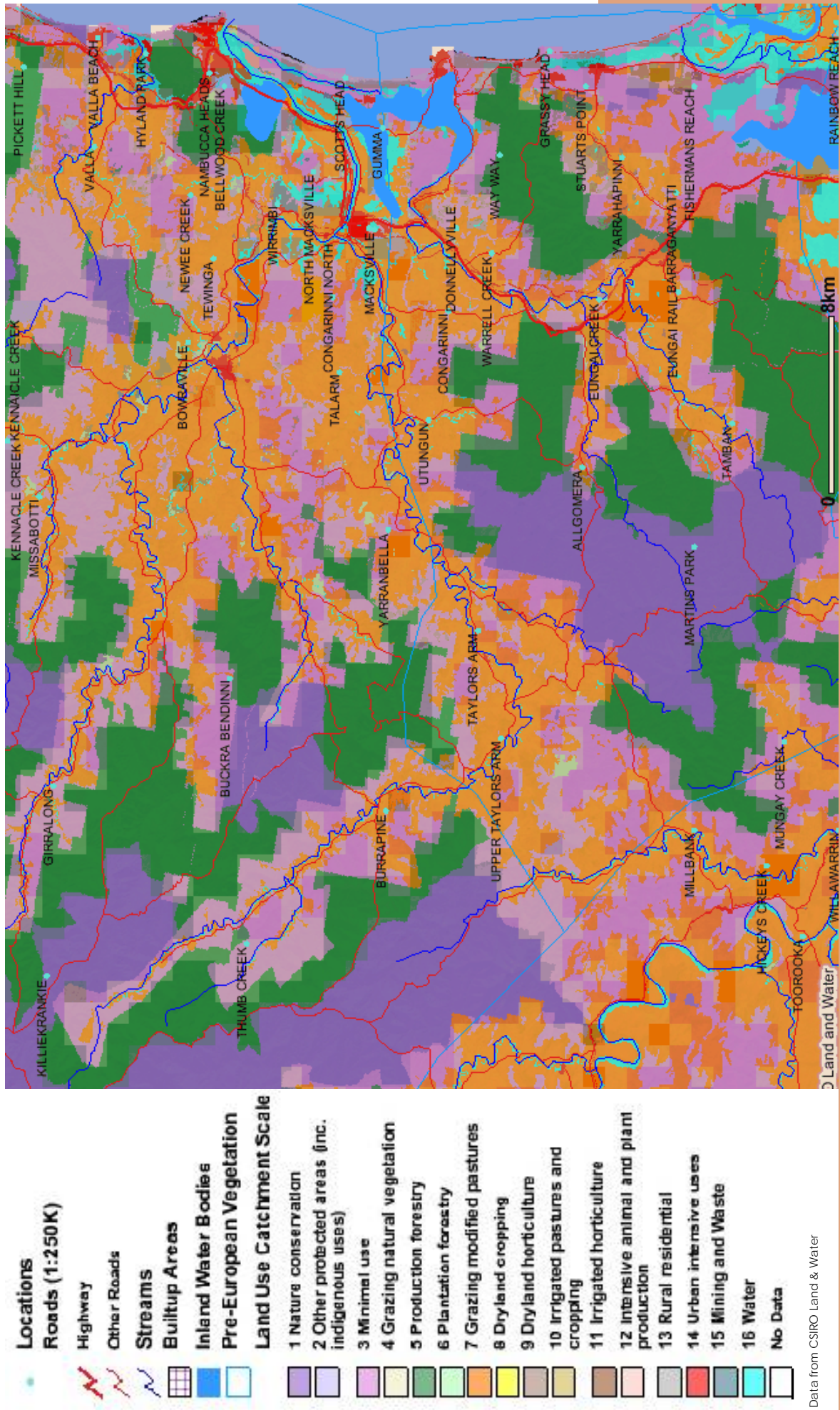
Rock Fillet Bank Restoration Work
Photo Landcare

Table 3.3 Known Potential Contaminated Sites in Nambucca Shire

No.	Parish	Usage	Owner	Property
A1.0	Nambucca	Garbage Depot	NSC	Lot 142 DP 700891, 711 Old Coast Road, Newee Creek
A2.0	Congarinni	Sanitary Depot	NSC	Lot 1 DP 510707 Gumma Road, Gumma
A3.0	Unkya	Garbage Depot	Unkya LALC	Lot 2 DP 870452, Little Tamban Rd, Eungai Creek
A4.0	Bowra	Garbage Depot	Crown Land	Lot 56 DP 755537 Gumbayngirr Road, Bowraville
A5.0	Denison	Garbage Depot	Varsanyi	Lot 622 DP 634925, 338 Greenhills Rd, Taylors Arm
A6.0	Warrell	Garbage Depot	NSC	Lot 215, DP 755562 South Pacific Drive, Scotts Head
A7.0	Nambucca	Garbage Depot	NSC	Lot 4, DP 749153, Pacific Highway, Lower Nambucca
A8.0	Valley Valley	Dip Site	Tape	Lot 154 DP 755560, 532-657 Newee Creek Road, Newee Creek
A9.0	Congarinni	Dip Site	Ainsworth	Lot 25 DP 755539, 178 Gumma Rd, Gumma
A10.0	Valley Valley	Dip Site	Cooper	Lot 2, DP 844950, Sullivan's Rd, Valla
A11.0	Nambucca	Garbage Depot	Crown (State Forest)	Nambucca State Forest, Off Old Coast Rd, Newee Creek
A12.0	Macksville	Dip Site	Boringer	Lot 4, DP 238366, 39A Boundary Street, Macksville
A13.0	Macksville	Dip Site	Fuller	Lot 5, DP 238366, 41 Boundary Street, Macksville
A16.0	Valley Valley	Rural/Proximity to Mines	Faringdon Pty Ltd	Lot 2, DP 848520, Pacific Highway, Valla (Oyster Creek Subdivision)
A17.0	Macksville	Bus Depot/ Council Depot	MD Trisley & KL Peterkin	Lot 4 Section D DP 8624, 16 Jellico Street, Macksville
A18.0	Unkya	Garbage Depot	NSC	Lot 8 DP 870452 Little Tamban Road, Eungai Creek
A19.0	Valley Valley	Arsenic Mine/Excessive Arsenic Levels Identified Elsewhere on Property	WA Welsh & WS Childs	Lot 19 DP 755560 Cow Creek Road, Valla

Source: Nambucca Shire Council and DECCW

Figure 3.1 Land Use in Nambucca Shire



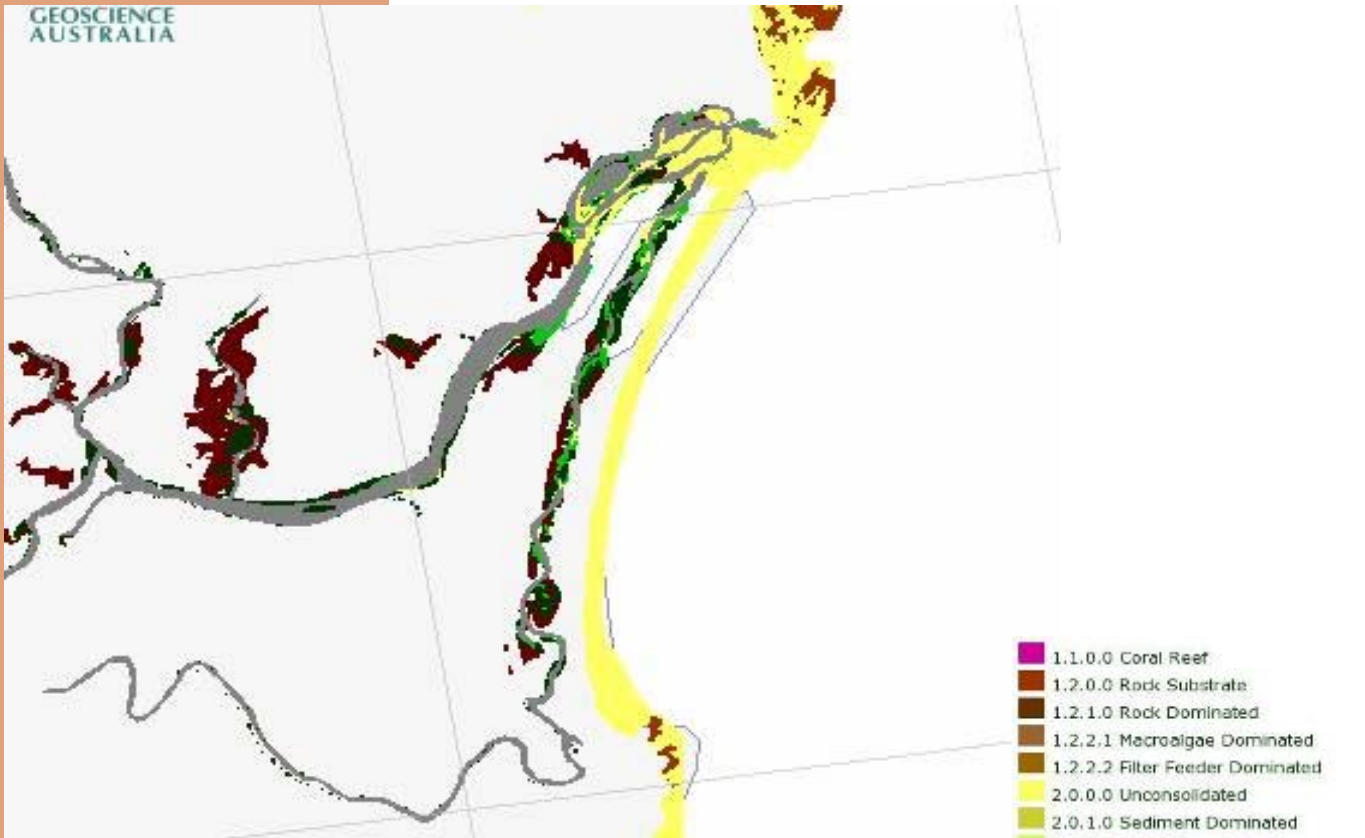


Figure 3.2 Nambucca River Sediment Forms

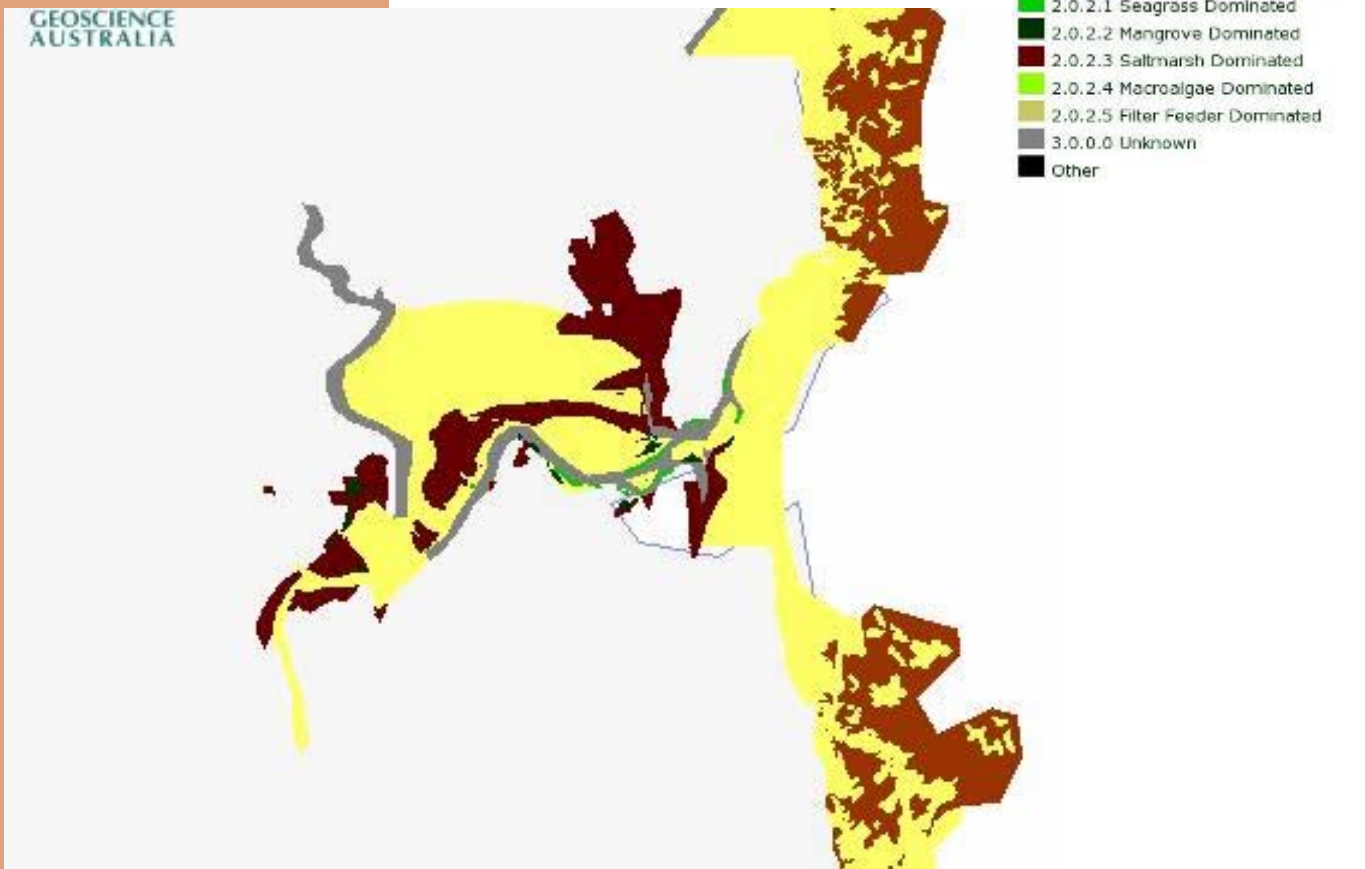
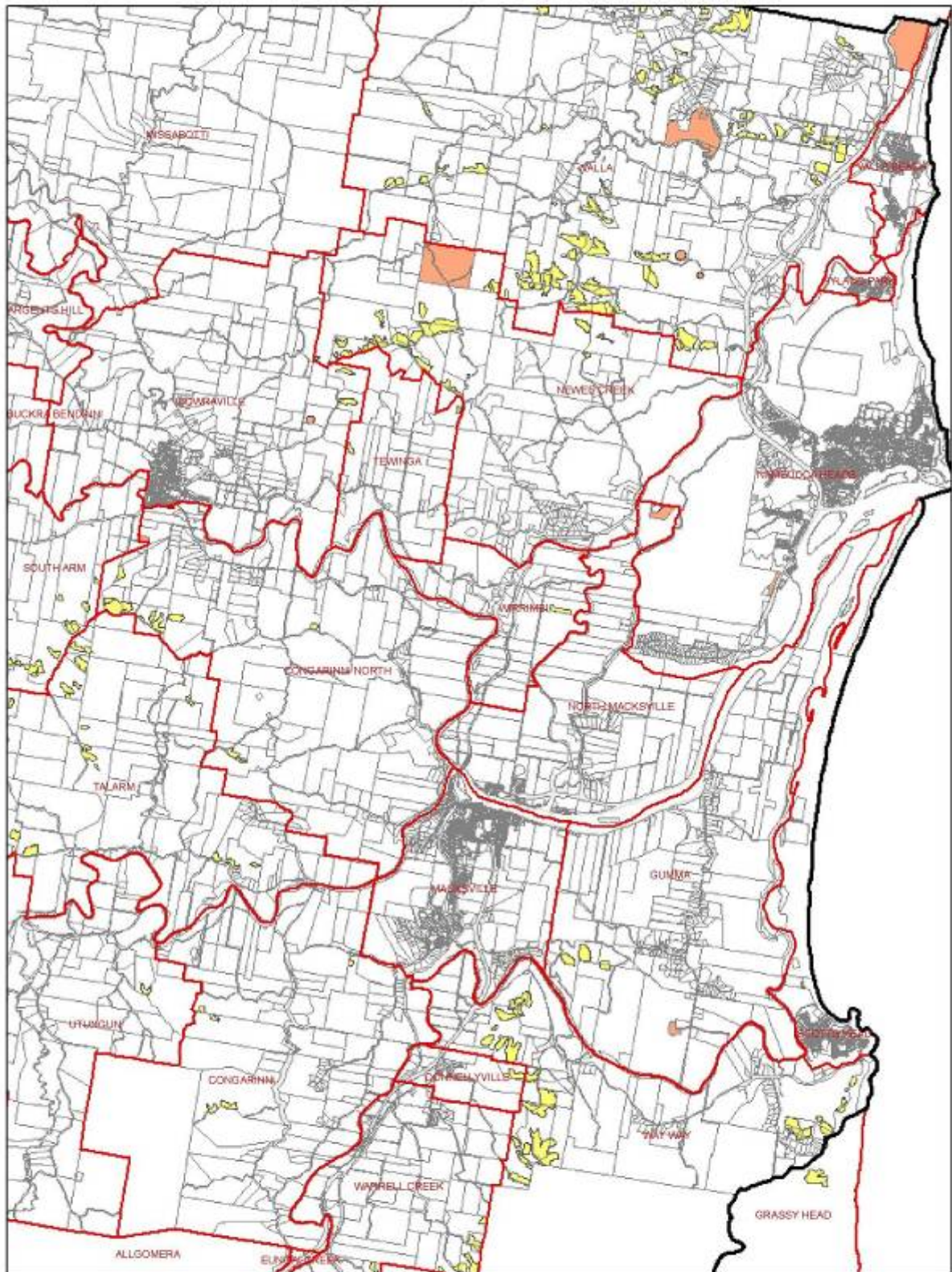


Figure 3.3 Deep Creek Sediment Forms

NAMBUCCA SHIRE COUNCIL



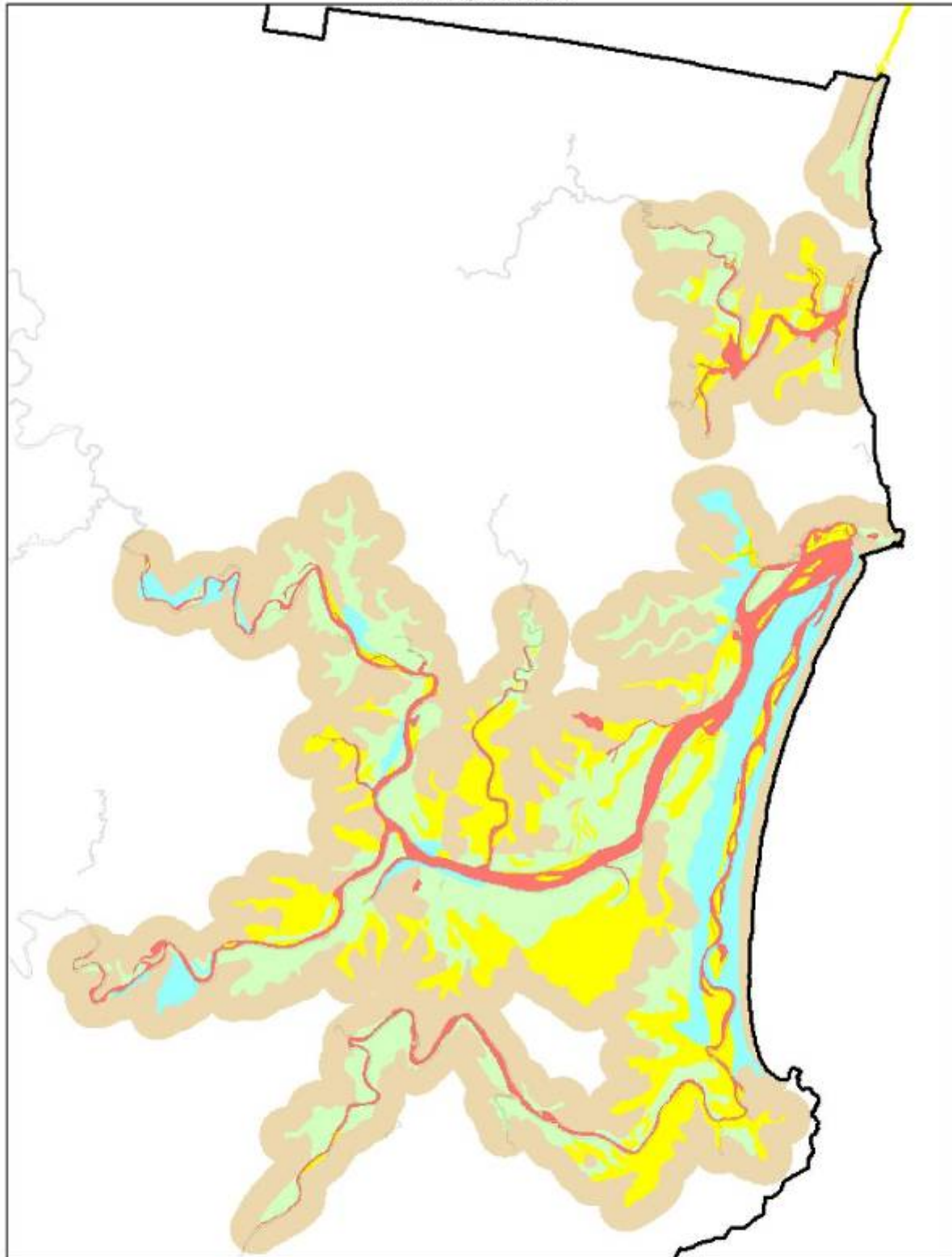
DISCLAIMER
 Maps Updated and Published by Nambucca Shire Council.
 Copyright Nambucca Shire Council 2009.
 Base data supplied by NSW Department of Lands.
 Map or plan accuracy is not guaranteed to be exact to scale
 or survey standard. Nambucca Shire Council accepts no
 responsibility for any errors or inaccuracies.

- Contaminated Land
- Banana Land


 1:99,293
 Scale @ A4
 Date: 10/03/2009

Figure 3.4 Contaminated land in Nambucca Shire

NAMBUCCA SHIRE COUNCIL
Acid Sulphate Soils



DISCLAIMER
Maps Updated and Published by Nambucca Shire Council.
Copyright Nambucca Shire Council 2009.
Base data supplied by NSW Department of Lands.
Map or plan accuracy is not guaranteed to be exact to scale
or survey standard. Nambucca Shire Council accepts no
responsibility for any errors or inaccuracies.

LEGEND	
	Class 1
	Class 2
	Class 3
	Class 4
	Class 5
	10m Contour
	Cadastre



Figure 3.5 Acid Sulfate Soils in Nambucca Shire

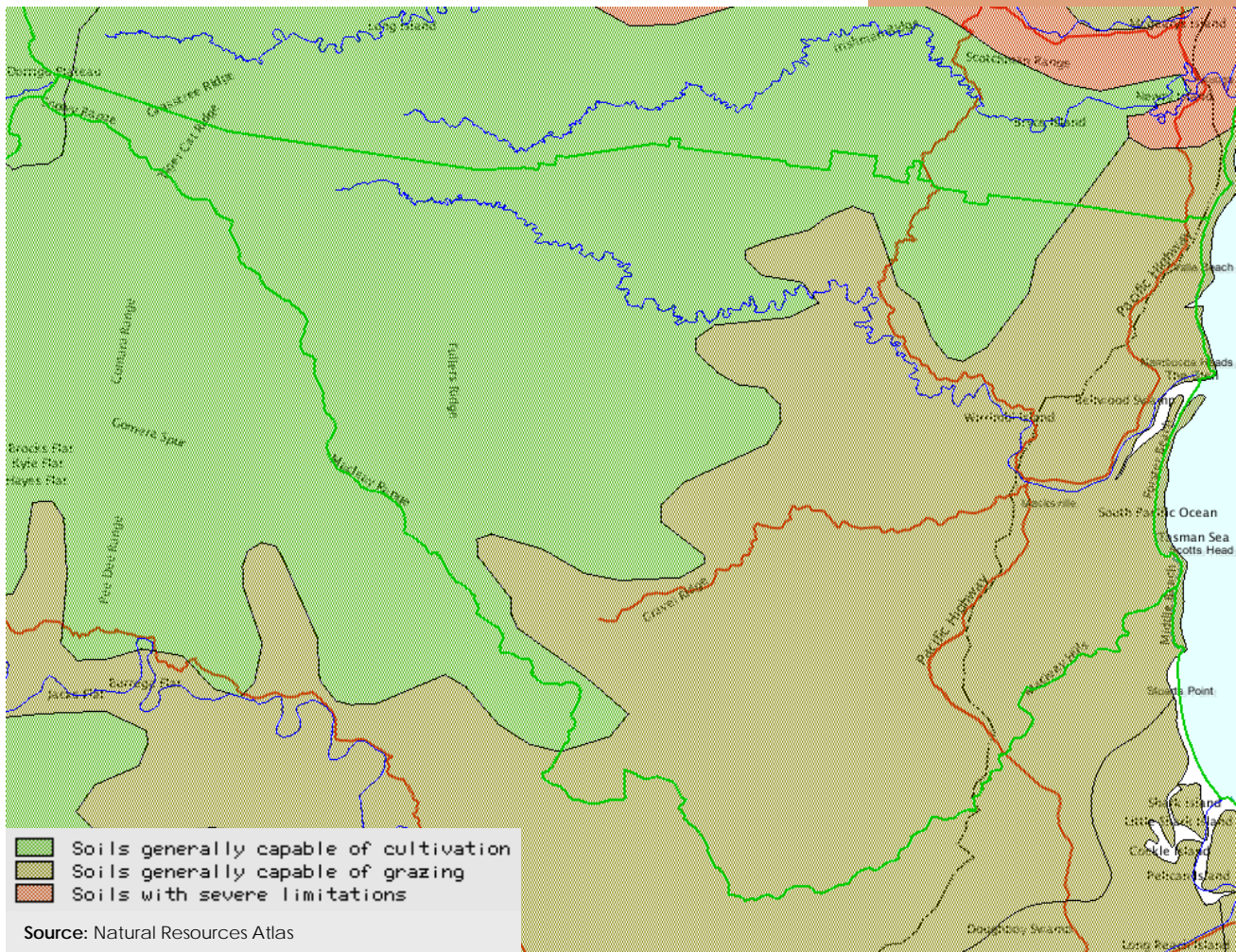
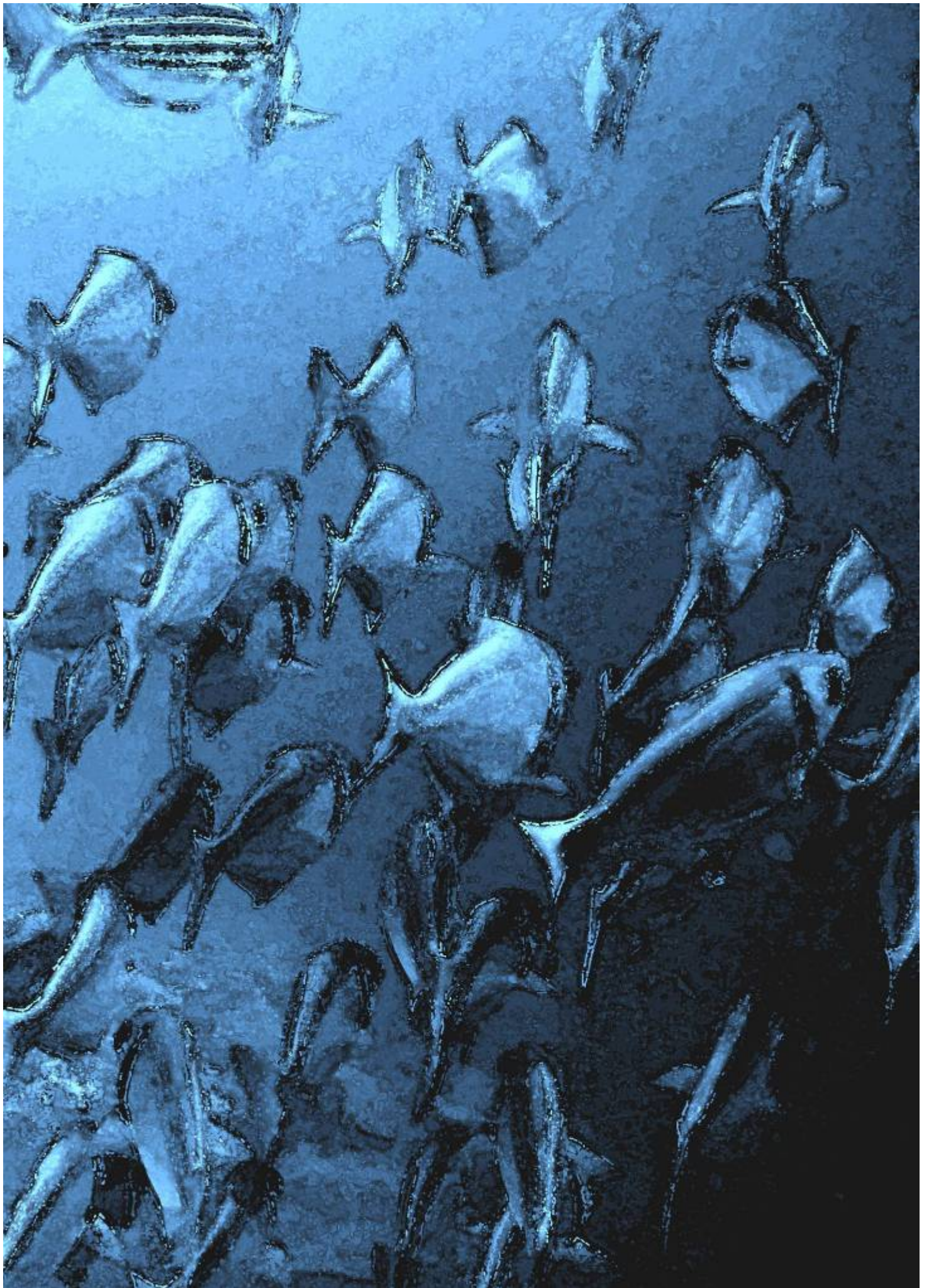


Figure 3.6 Agricultural Land Soil Capability of Nambucca Shire



4.0 Aquatic Systems - Water

4.1 INTRODUCTION

Aquatic resources form an integral part of the environment in the Nambucca Shire LGA. Not only do these provide the scenic backdrop which is integral to the character of the Nambucca Shire, these resources also provide habitat for a diverse variety of flora and fauna species, provide water for urban and agricultural supplies and allow important economic and social activities to take place, such as aquaculture, fishing and boating.

There is a diverse range of aquatic systems that occur naturally in the Nambucca Shire, these include the Pacific Ocean and associated coastline and beaches, the Nambucca River and its tributaries, intermittently closed and open lakes and lagoons (ICOLL's), wetlands and groundwater aquifers.

The Nambucca River drains its 1,330km² catchment that is mostly contained within the Nambucca Shire LGA. Warrell Creek and Taylors Arm are the 2 main tributaries of the Nambucca River.

There are several smaller catchments that are essentially ICOLL's, north of the Nambucca

River. These are, Swimming Creek and Beilby's Creek both in Nambucca, Deep Creek that drains an area south-west of Valla and Oyster Creek that drains a small area north-west of Valla Beach.

Since the commencement of European settlement, the Nambucca River has been altered substantially, the entrance and main channel have been trained with breakwalls and some dredging. The majority of the waterways have been affected by the process of accelerated erosion and deposition, gravel extraction and riparian vegetation removal.

One of the greatest pressures on aquatic systems is urban and agricultural stormwater run off. Stormwater is the untreated run off from hard surfaces and agricultural lands. The stormwater traditionally contains pollutants such as nitrogen, phosphorous, metals (lead, zinc, copper), hydrocarbons, faecal bacteria and grease, not to mention the sediment loads from denuded areas and eroded banks. This all has adverse impacts on the health of the aquatic systems including direct affects on the fishing and oyster industry of the Nambucca River.

Human impacts within the catchment have increased the amount of litter, nutrients, bacteria, heavy metals and sediment being discharged into the receiving waters, thus degrading the quality of our local aquatic systems.

4.2 PRESSURES ON OUR AQUATIC SYSTEMS

- Degradation of Shire waterways
- Estuarine and coastal issues
- Macksville, Nambucca, Scotts Head and Bowraville Sewage Treatment Plants
- Septic overflows
- Environmental impacts from businesses
- Quality of stormwater
- Increased development and reduction of pervious surfaces
- Loss of Riparian Vegetation
- Pollution incidents
- Groundwater issues
- Flood events
- Potential Acid Sulfate Soils
- Water supply

Table 4.1 and 4.2 Aquatic System Indicators

Gross Pollutant Traps (GPT's) **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Number of Gross Pollutant Traps (GPT's) in Nambucca Shire	no data	no data	no data	11	14	↑
Amount of waste diverted from the Nambucca River (tonnes)	no data	no data	no data	30	47	↑

** Statistics from Councils Engineering Department

Source of Water Pollution **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Construction (sediment, gravel, mud)	3	0	1	1	6	↓
Chemicals (pesticide spills, other spills)	2	1	2	4	2	↑
Biological (septics, animals, ofal)	3	3	4	9	12	↓
Total Complaints	8	4	7	14	20	↓
Complaints to DECCW ***	no data	no data	no data	11	21	↓

** Statistics from Councils Customer Service Requests ***Statistics from Department of Environment, Climate Change and Water (DECCW) www.environment.nsw.gov.au



Sediment Skirt Used to Protect Aquatic Environment
Photo NSC



Poor Water Quality
Photo NSC



Sediment Flowing into Nambucca River
Photo NSC



Unfenced Creek with Cow
Photo NSC

44.2.1 Degradation of Shire waterways

The Department of Land and Water Conservation commissioned a study, "River Styles on the North Coast", whose aim was to investigate the different styles of river evident in the North Coast area and make an assessment of their current status. The preliminary findings of the study indicated that the majority of the rivers within the Nambucca Shire were classified as degraded, and that many had a low likelihood of success for rehabilitation. This report suggests that the state of degradation is strongly linked to the presence of native vegetation on the river banks and within channels, as well as the actual style of the river concerned. The clearing of riparian vegetation in association with agricultural operations is implicated as the process most likely to have contributed to the degraded state of the rivers and the loss of areas of floodplain due to bank erosion.

Sedimentation of the Nambucca River entrance is likely to be perceived as the largest problem in the waterway. Sediment deposited in the river entrance is believed to reduce the navigability and flushing volume of the river.

As with the majority of estuarine entrances on the eastern seaboard of New South Wales, the condition of the Nambucca River estuary entrance changes considerably over time. This change is a manifestation of the influence of naturally variable conditions that affect the accumulation of marine sediments in the entrance, combined with human-based activities which alter the rates of deposition and transport of sediments into and within this water body. Of principal concern in this regard are catchment runoff/flooding and significant storm/high wave events.

Catchment runoff/flooding will tend to assist in the maintenance of "open" entrance conditions by scouring sand out of the entrance and into the nearshore zone. In comparison, high wave events will tend to mobilise coastal sand resources and enable them to be transported into the estuary where they will deposit and tend to "close" the entrance (WBM Oceanics, 2000).

Gravel Extraction is one of the most contentious issues in the Nambucca Shire catchment. Extraction has been attempted in most of the watercourses in the Nambucca Shire over the past 90 years. Although gravel extraction has now ceased from the bed of the

watercourses, its legacy remains, with A study by Lyall & Macoun Consulting Engineers (1999) identifying that the activity has contributed to bed lowering and the loss of bed armour, which have initiated the destabilisation of the river channel and bank collapse.

Bank erosion is evident along all of the waterways in the Nambucca Shire and ranges from relatively minor to severe (i.e. the loss of hectares). The primary causes of bank erosion include flood flows, tidal flows, waves (wind and boat generated), land clearing and sand and gravel extraction.

Stock access to stream banks has a number of impacts on the stability of river banks and stream ecology. The sharp hooves of farm stock can contribute to the physical breakdown and erosion of the stream banks. Stock can also adversely impact on riparian vegetation by trampling and eating it.

4.2.2 Estuarine and coastal issues

OzCoasts (2008) Estuary Assessment for Non-Pristine Estuaries states the Nambucca River is currently in a extensively modified condition. Their first classification found the estuary to be severely modified and was based on the changes to the catchment natural cover of 60% cleared.

The way the Nambucca River should function is primarily a result of river energy. It is a wave dominated delta, that means the estuary would have a low sediment trapping efficiency, naturally low turbidity, salt wedge/partially mixed circulation and low risk of habitat loss to sedimentation.

Table 4.3 Nambucca River Nutrients

	Nambucca River Nutrients	
	Pre European Yields	Current Yields
Fine suspended sediment	0.60 kilo tonnes/yr	24.20 kilo tonnes/yr
Dissolved Phosphorous	6.60 tonnes/yr	5.40 tonnes/yr
Fine Sediment Phosphorous	0.40 tonnes/yr	14.0 tonnes/yr
Dissolved Nitrogen	132.20 tonnes/yr	135.58 tonnes/yr
Fine Sediment Nitrogen	4.90 tonnes/yr	65.30 tonnes/yr

© OzCoasts 2008

In contrast Deep Creek is assessed as Largely Unmodified with a catchment of natural cover only 45% cleared.

Table 4.4 Deep Creek Nutrients

	Deep Creek Nutrients	
	Pre European Yields	Current Yields
Fine suspended sediment	0.10 kilo tonnes/yr	1.20 kilo tonnes/yr
Dissolved Phosphorous	0.50 tonnes/yr	0.60 tonnes/yr
Fine Sediment Phosphorous	0.00 tonnes/yr	1.0 tonnes/yr
Dissolved Nitrogen	10.00 tonnes/yr	10.53 tonnes/yr
Fine Sediment Nitrogen	0.70 tonnes/yr	4.70 tonnes/yr

© OzCoasts 2008

4.2.3 Macksville, Nambucca, Scotts Head and Bowraville Sewage Treatment Plants

Sewage from the urban areas of Nambucca Heads, Macksville, Scotts Head, Bowraville, Valla Beach and Hyland Park is treated at one of the four Wastewater Treatment Works that Council owns and operates. Depending on their level of treatment, these works discharge effluent of varying quality to the adjacent waterbodies (not generally the case at the Bowraville works), which is monitored regularly and subject to strict Department of Environment and Climate Change Environmental Protection Licence conditions.

4.2.4 Septic overflows

A large number of rural residences and rural-residential subdivisions are serviced by on-site sewage management systems. A recent concern for local Councils is the cumulative impact of poorly functioning on-site management systems on the water quality of waterways. Council is in the process of undertaking a comprehensive Shire wide audit of all on-site sewage management systems in accordance with amendments to the *Local Government Act 1993*, which requires Council to issue an approval to operate on condition of satisfactory operation of the system. Consequently, any system inspected that is not operating satisfactorily will be required to be brought up to standard.

4.2.5 Environmental impacts from businesses

There are a number of premises in the Shire that hold a NSW Department of Environment, Climate Change and Water Environment Protection Licence under the *Protection of the Environment Operations Act 1997*. These premises discharge various substances and are all stringently controlled by the Department of Environment, Climate Change and Water.

In addition to licensed businesses there are many other businesses operating in the shire that contribute to decreased water quality, the main ones being, building sites, agricultural industries, automotive businesses and any other that uses or has the potential to pollute water.

Many businesses have a trade waste agreement with Council. Trade waste means any liquid, and any substances in the liquid that is produced at the premises from industrial or commercial operations.

Council trade waste permits allow trade wastewater to be accepted for processing by the sewage system, subject to conditions of their agreement. There is a total of 200 trade waste agreements operating in the shire.

4.2.6 Quality of stormwater

There are relatively few pressures placed on the quality of the water resources in the Nambucca Shire. The cumulative effect of these pressures however, can be appreciable, particularly during and immediately after rainfall. Pollution of watercourses frequently occurs after rainfall as a result of sediment transport in stormwater.

A proportion of this sediment results from erosion of soil from building sites and subdivisions which do not provide erosion and sediment control to the watercourses causes a decline in estuary health by affecting aquatic organisms, causing siltation, reducing water depth, altering flow regimes and generally reducing the amenity of the waterway.

Urban runoff has a notable impact on the quality of the watercourses in the Nambucca Valley. The urban environment modifies the natural environment substantially by increasing impervious surfaces, altering natural drainage patterns and concentrating forms and sources of pollution in a specific area.

The pollutants derived from urban areas include litter, sediment, nutrients, microorganisms, oils & greases, heavy metals, pesticides and oxygen depleting materials such as grass clippings. These pollutants are transported into waterways via stormwater runoff, in the majority of instances without treatment.

Such pollutants can have a considerable impact on the receiving watercourse. Examples of impacts include eutrophication from elevated nutrient levels, heavy metal contamination of aquatic fauna, fish kills and a reduction in the aesthetic value of the watercourse.

The industrial areas in the Nambucca Valley are typically small scale developments, fragmented throughout the major towns in the Valley. The pollutants derived from these areas are typical of small scale industrial areas and include hydro-carbons, heavy metals and oils & greases. Similar to urban pollutants, these substances can be transported by stormwater runoff into nearby watercourses where they



Macksville Sewage Treatment Plant
Photo NSC



Aeration Pond at a sewage Treatment works
Photo Google



Beer Creek Run off During Storm Event
Photo NSC



Flood Waters Receding, Congarinni
Photo NSC



Pollution From a Construction Site
Photo NSC



Flooding in Hyland Park February 09
Photo NSC



Flooding in Cow Creek February 09
Photo NSC



Flooding on Turners Flat April 09
Photo NSC

can have substantial impacts on water quality and the aquatic ecosystem. Although the small-scale nature of industrial development in the Nambucca Valley suggests that runoff from these areas would contribute a relatively small amount of pollutants to the river system, the cumulative effect of such pollutants over time has the potential to cause considerable, long-lasting effects to the aquatic environment.

A large proportion of the Nambucca Valley is designated as rural. Agricultural, rural-residential and extractive industry activities all take place in these areas. The primary agricultural pursuits in the Nambucca Valley are beef and dairy cattle grazing, cropping and horticulture. Runoff from agricultural and other rural areas can contribute suspended solids, nutrients, micro-organisms and pesticides to waterways. These pollutants have the potential to impact on water quality.

4.2.7 Increased development and reduction of pervious surfaces

Increased urban development increases the amount of impervious surfaces, such as roads, house roofs and constructed drainage areas. These impervious areas increase the amount of stormwater run off and concentrates the runoff into the drainage system.

4.2.8 Loss of Riparian Vegetation

Riparian vegetation is essential to the stream ecology and stability. The area in which it grows however, was the first to be cleared when the area was settled, due to its accessibility by boat and the presence of rich, alluvial soil flats which were ideal for agriculture. The removal of this vegetation has modified stream ecology, reduced the amount of woody debris entering the waterways and decreased the stability of the stream bank and bed. There are only thin fringing riparian vegetation zones remaining along much of the Nambucca River, Taylors Arm and Deep Creek. Good riparian zones, however still exist along much of Warrell Creek and Oyster Creek.

4.2.9 Pollution incidents

This reporting year saw an increase in water pollution complaints, mostly in response to overflowing OSMs and animal sewage disposal.

Construction pollution (sediment) incidents are still a major contributor to water pollution in the shire. There is a great number of building companies and developers that do not use or use inadequate pollution control structures on building sites, and where they do, they are not maintained to a workable level.

4.2.10 Groundwater issues

Groundwater is water that exists beneath the surface of the land. The top surface of groundwater is called the water table and is fed from permeable materials such as sandy soils, and from vaults in the surface.

Groundwater exists below all land but is only accessible in some locations. There are numerous locations in the Nambucca Shire where groundwater naturally comes to the surface, the main area being the Borefields.

In 1998 the (former) Department of Land and Water Conservation carried out an assessment of aquifers in New South Wales. The aquifers were classified according to the risk of over-extraction and/or contamination. The risk assessment used was a multi-criteria analysis developed to define the total risk to an aquifer system (high, medium or low).

The results of this report were used to prioritise the development of groundwater plans. These plans were developed for all aquifers assessed as being at high risk.

Other than the alluvium downstream of Macksville being classified as medium risk, mainly due to potential contamination risks, the remainder of the Nambucca Shire Local Government Area was classified as low risk. As such, the Department of Natural Resources has no intentions for the development of any groundwater management plans within the Shire. The department however, is monitoring the issuing of new licences within the unconsolidated sediments associated with the Nambucca River and its tributaries with the intent of providing greater security for the borefield adjacent to Bowraville during drought periods.

It is important to note that the department considers the extraction of groundwater for domestic purposes other than reticulated supply from aquifers to be minimal compared to extraction for town water supply and irrigation.

4.2.11 Flood events

The Mid North Coast was declared a Natural Disaster Zone on February 17th 2009. At Nambucca a record 512 mm of rain fell with widespread flooding across the shire. Bowraville was isolated when rising waters peaking at 10.1m cut both access roads. Many other roads were cut by flood waters across the shire including Scotts Head Road along Warrell Creek.

Just 6 weeks after the February flood, Nambucca Shire was again declared a

Natural Disaster Zone on the 1st April after the Nambucca River peaked at 2.3 m at Macksville with over 700 mm in 48 hrs. The Pacific Hwy was cut off at Wrights Corner. There was serious road damage caused by both floods.

The Nambucca River made history when it flooded for a third time in under 4 months on the 23rd May. The Nambucca Valley SES said in the 98 years they have been keeping records there had been no history three floods of size in a few months. The River peaked at 2.4 m at Macksville but damage was minimal compared to the previous two floods.

4.2.12 Potential Acid Sulfate Soils

Potential Acid Sulfate Soils (PASS) are found in every coastal estuary and embayment in NSW. (see figure 3.5 in Land) Whilst they exist they cause no harm unless disturbed and exposed to air by drainage or excavation. Sulfuric acid can be produced in large quantities with major impacts on water quality and aquatic life. These impacts can reduce aquatic plants, fish, crustaceans, birds and other animals including significant impacts of the aquatic industries such as oyster production in the Nambucca River.

Other affects are damage to metal and concrete pylons of bridges, pipes and other structures

More information can be found at: <http://www.clw.csiro.au/acidsulfatesoils>

4.2.13 Water supply

Groundwater recharge and runoff maintain water flow in the river systems in the Nambucca Valley. A gauging station is located at Bowraville that records the stream flow of the Nambucca River

The existing urban water supply is based on the extraction of water from the borefields located approximately 1 km upstream from Bowraville. Council installed a system whereby borefield water levels are monitored electronically.

Excluding rainfall and evaporation, the factors that have the largest influence on the quantity of the water resources of the Nambucca Shire are extraction for the reticulated water supply and rural extraction for domestic and agricultural purposes.

Many rural properties in the Shire extract water from surface and groundwater resources for domestic purposes. Although, regulated by the Department of Natural Resources, it is possible to quantify the number of

licences in existence, it is very difficult to estimate the exact quantity of water being extracted.

Water is extracted from surface and groundwater resources and used for agricultural purposes such as stock watering and irrigation. Once again, the volume of water extracted for agriculture from surface or groundwater resources has not been quantified.

4.3 RESPONSE TO THESE PRESSURES

4.3.1 Degradation of Shire waterways

The Nambucca River Estuary Management Plan (NREMP) was adopted by Council on the 6 February 2008.

The objectives of the NREMP are based on community uses and values associated with the estuary and the technical reviews completed as part of the development process. These objectives form the 'goal posts' for estuary management and will serve as a benchmark as to which assessments and the success of the plan will be measured.

The NREMP objectives include:

- Protecting and enhancing the existing uses and values of the estuary in both the short and long-term by adoption of best practice land use planning and development controls.
 - Maintaining navigation within the lower estuary for shallow draft vessels, consistent with current use, to maintain user amenity, safety and aesthetics, within the natural constraints of ocean and fluvial processes.
 - Encouraging waterway use that causes a minimum of environmental and social impact, and where possible, enhances user amenity through improved safety controls and reduced conflict. Improve the safety of swimmers of all ages within the estuary.
 - Maintaining and improving water quality within the estuary to support ecosystem function, commercial fishery/oyster production and tourism, and other forms of human recreation including swimming.
 - Protecting and enhancing habitats to improve the health and biodiversity of the Nambucca River Estuary.
- Improving overall riverbank condition on all major streams and waterways of the Nambucca Valley to limit further bank erosion and sedimentation.



Landslide in Nambucca February 09
Photo NSC



Flooding in Macksville February 09
Photo NSC



Flooding in Macksville February 09
Photo NSC



Flooding on Scotts Head Rd April 09
Photo NSC



Flooding in Macksville in April 09
Photo NSC



Constructed Wetland at Waste Transfer Station
Photo NSC



Run off During Storm Event
Photo NSC



Nambucca River and Training wall
Photo NSC

- Consider the potential implications of sea level rise on the estuary and its surrounds as a result of global scale climate change.
- Protect areas and items of Aboriginal and European cultural heritage within the estuary.
- Maintain open lines of communication with the community and local Aboriginal groups in relation to the ongoing management of the estuary.
- Maintain and improve the viability of existing (and potential future) types of ecologically and commercially sustainable estuary-based

There are 25 prioritised management strategies that will be implemented as funding becomes available. Funding for the NREMP strategies will be from the Environmental levy from avenues for source funding from various agencies

4.3.2 Estuarine and coastal issues

As in 4.3.1 the Nambucca River Estuary Management Plan has many strategies for many of the issues of water quality.

4.3.3 Macksville, Nambucca Heads, Scotts Head and Bowraville Sewage Treatment Plants

Council monitors the discharges from its four wastewater treatment works within the Shire. The Macksville and Nambucca Heads works are monitored on a fortnightly basis, while the Bowraville and Scotts Head works are monitored on a monthly basis. All four works are subject to individual Environment Protection Licences.

Council submits annual reports to the Department of Environment and Climate Change relating to these licences. Due to a number of seasonally-related operational and environmental factors governing both the volume and composition of effluent, there are fluctuations in the quality of effluent discharged under these licences. However, these systems generally function well, and typically operate within the conditions stipulated in the individual licences.

Council continues with its water quality monitoring program that commenced in 1992. With the inclusion of Warrell Creek this program collects water samples from eight sites once a month which are analysed for dissolved oxygen, pH, salinity, conductivity, turbidity, temperature, total phosphorus, nitrate, nitrite, faecal coliforms and total suspended solids

4.3.4 Septic overflows

Council continues to inspect and approve septic systems. Any system found not to be operating as intended is flagged and the owners of the property are issued a notice to repair it to Australian standards.

Council has a two fold approval process relating to all types of OSMSs installed within the Shire. 1) Approve the initial installation of a new or modification of existing systems and 2) the issuing of ongoing operating approvals for the systems. This process is ongoing for all registered systems

All OSMSs come under an operating licensing program and each installed system is inspected and licensed in accordance with a risk assessment process which is set down in Council's Onsite Sewage Management Plan. Operating approvals are issued on each system depending on the level of risk to the environment and issued with a Class 2 (one year), Class 2 (three year) or a Class 3 License (five years).

4.3.5 Environmental impacts from businesses

Under the Stormwater Management Plan Council continues to approve trade waste licenses and monitor discharge closely.

Education programs such as the 2004 program targeted at builders, developers and automotive repairers funded by the Stormwater Trust Grant will be reviewed and new rounds of funding will be sourced for continued education.

Council continues to inspect trade waste agreement holders premises for compliance.

4.3.6 Quality of stormwater

In 2001 a Stormwater Management Plan was developed by Council to address stormwater issues in the major towns as well as in rural and rural-residential areas in the Shire

Major Stormwater Management Plan implementation strategy tasks have been carried out by Council

Gross Pollutant Traps (GPT) have been installed on several creek drains in the shire to reduce the amount of litter being flushed into the Nambucca River during stormwater flows, the most recent ones installed in Council's works depot in River Street in May 08 to prevent pollutants from the depot entering the Nambucca River.

4.3.7 Increased development and reduction of pervious surfaces

To address this Water Sensitive Urban Design (WSUD) is being encouraged in all developments to reduce the amount of urban generated storm run off entering the Shires waterways, thus reducing the occurrence of polluted waterways after rain events.

More information can be found at: <http://www.urbanwater.info/engineering/wsud.cfm>

4.3.8 Loss of Riparian Vegetation

Nambucca Valley Landcare and the Nyambaga Green Team have been working on riparian works to rehabilitate and stabilise river banks through out the year. Also see section 5.4 in Biodiversity for information of specific projects.

4.3.9 Pollution incidents

Ongoing compliance and the issuing of Penalty Notices and Clean-up Notices under the *Protection of the Environment Operations Act 1997* are used to reduce the amount of building sediment entering the Shires waterways.

The use of licensed sediment control contractors, toolbox education and good management on building sites will ultimately reduce the incidents of water pollution.

Council continues to protect the environment whilst conducting works with the appropriate sediment control devices. Large floating booms with silt skirts are utilised when working near the river. Works staff are trained in the use and implementation of an array of sediment control devices

4.3.10 Groundwater issues

It is difficult to identify and quantify the pressures being placed on the quality of the groundwater of the Nambucca Valley due to the complexity of the hydraulic, chemical and biological forces that influence it.

4.3.11 Flood events

Flood events are a natural occurrence and as part of the climate change movement it is expected that flood incidences will become more frequent and potentially more intense. Better insight into sea level rise and development considerations will be explored in the near future.

4.3.12 Potential Acid Sulfate Soils

Gumma Gumma Wetland project in conjunction with Wetland Care Australia, Dept. Environment and Climate Change and Nambucca Valley Landcare is to turn the circular swamp

that had significant acid sulfate scalds into a productive eleocharis wetland. Council completed stage 1 by building a main dropboard weir into the Gumma Gumma Creek in December 07. This was completed just before the rain began to fall, by February 08 the Gumma Wetland had filled up and local oyster farmers have noticed a difference in the water colour and higher pH than in the previous years. Work is still in progress.

Wetland Care Australia in conjunction with Landcare, Northern Rivers Catchment Management Authority and local land holders under the *Coastal Floodplain and Acid Sulfate Soil Management Project - Part G Nambucca Floodplain* was able to fund the process of the Wirrimbi Park Wetland near Newee Creek. The 37 ha site historically contained a large freshwater wetland system that drained into nearby Newee Creek. This wetland system had been considerably altered through farming practices and has been predominately cleared of the Melaleuca and Swamp Oaks once prevalent. A drain had been constructed along the natural depression line and a one way floodgate culvert had been constructed. The site has a very high probability of Acid Sulfate Soils and has developed many scalds.

Works done include;

- Re-design of the floodgate to achieve efficient agricultural drainage and exclusion of tidal water and maintenance of water quality and fish passage.
- Exclusion of stock by fencing off the highly eroded modified drainage system.
- Planting of 500 native plant species.
- Construction of a low level water control structure with a dropboard weir in the existing drain, that allows fresh water to be held back over the floodplain on a seasonal basis.

The area will be fenced off from cattle until the wetland vegetation is well established and thereafter the area may be heavily grazed for short periods during dry times providing a valuable drought reserve.

4.3.13 Water supply

In the late 1990's Council adopted an option to construct and off-stream storage adjacent to the existing borefield and water treatment works at Bowraville. Due to a significant drop in demand which resulted from the closure of the Midco abattoirs, Council deferred the construction of the storage, expecting it would not be required until 2020.



Deep Creek Entrance During Flood Event in February 09
Photo NSC



Deep Creek at Valla Beach
Photo NSC



Flood Damaged Bridge, Valla
Photo NSC



Nambucca River Estuary Tour
Photo NSC



Pollution (paint) entering the stormwater System
Photo NSC

The drought of the 2000's, however, revealed how vulnerable the groundwater supply was to extended dry periods. As a consequence, in-depth investigations were undertaken, which produced several recommendations for securing supply.

Even after reviewing the various options, Council is yet to reach agreement for an off-stream storage dam, planned for constructed in the vicinity of the borefield at Bowraville.

Council has installed water saving devices in all Council owned or operated facilities in an effort to reduce the amount of water being used at these locations. In addition to these initiatives, Council undertakes annual leakage detection surveys of trunk main and reticulation supply systems. This is performed in order to reduce leakage of potable drinking water, and to identify areas needing maintenance or repairs. Council also participates in community awareness and education programs including public displays and provision

of Waterwise information to Shire residents.

Demand management is also achieved through current BASIX provisions requiring the installation of rainwater tanks in all new dwellings. For those living in existing dwellings, which do not fall under the consideration of BASIX, a rainwater tank rebate is available for the purchase of a new tank, and to offset the cost of plumbing needed to attach rainwater tanks to either the toilet, washing machine or both.

The water collected in rainwater tanks can be used to replace drinking water currently being used in the flushing of toilets, washing and watering gardens

This will reduce the demand for water that has been extracted from the borefield, treated at the Bowraville Water Treatment Works, and piped around the Nambucca Shire in the present reticulation system. This would represent a considerable saving in water and money, as the cost to Council and ratepayers of performing these services is not inconsiderable.

Table 4.5 and 4.6 Aquatic System Indicators

Regional Indicator - Water Consumption	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
total reticulated water consumption in LGA (ML)* **	1 878.6	1 750	1 806	1 658	1 446	↑
per capita reticulated water consumed in LGA (kL/person)* **	158.3	145.1	145.1	122.2	125.28	↔
daily per capita reticulated water consumed in LGA (L/person)* **	433.7	397.5	397.5	335	343.2	↔
reticulated water daily demand peak (KL)* **	7 900	6 700	7 928	6 600	6 870	↑
Population % connected to reticulated water* **	67	67	68	72	61	↔
total reticulated water consumption by Council (KL) **	no data	27 288	19 543	20 310	15 300	↑
Number of surface water licences***	no data	no data	193	197	193	↔
Number of bore water licences***	no data	no data	546	562	569	↔

* Denotes Regional Indicator ** Statistics from Councils Engineering Department *** Statistics from Department of Natural Resources (DNR) www.naturalresources.nsw.gov.au

Regional Indicator - Waste Water **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Wastewater treated at STP's (ML)*	1 418	1 567.8	1 385.8	1 424.0	1 946	↓
waste water treated to tertiary level (ML)*	1323 (93.3%)	1468.2 (93.6%)	1308.1 (94.4%)	1340.0 (94.1%)	1652 (84.9%)	↓
wastewater treated at treatment plants to secondary level (ML)*	94 (6.7%)	99.2 (6.4%)	77.9 (5.6%)	84 (5.9%)	294 (15.1%)	↓
population % serviced by sewage system*	64	64	64	64	60.4	↔
population serviced by on-site effluent disposal systems*	36	36	36	36	39.6	↔
Number of approved on-site effluent disposal systems*	no data	576	37	636	642	↑
Number of existing on-site effluent disposal system inspections*	no data	958	449	643	665	↑

* Denotes Regional Indicator ** Statistics from Councils Engineering Department

Nambucca Shire Council is currently engaged in preparing an Integrated Water Catchment Management (IWCM) Plan. As the name suggests, this is a total systems approach to water management, incorporating all facets of the water cycle in the Nambucca Valley. This is being performed in conjunction with the appropriate State Government departments, who are providing technical expertise and overall guidance. Importantly, many public resource-user groups have been involved in this process, and continue to offer input into the preparation of a comprehensive plan of management for this vital resource.

4.4 A SNAP SHOT OF 2008/09

- Nambucca High School in conjunction with Nambucca Plumbing Supplies secured a community Water Grant under the Australian Government Water Fund project in 2008.

Rainwater from one roof was harvested and diverted to two storage tanks. This water is used for flushing toilets. Inefficient toilets, taps and urinals were also upgraded. The benefit was expected to reduce mains water usage by approx 70%
- Deep Creek's entrance closed in late June early July 2008 after heavy seas raised the beach berm inhibiting the outflow of water. King tides around the time overflowed into the lagoon, added to this, localised heavy rainfall across the catchment, caused the water level to rise fast to over 1.2 AHD within a month. July 2000 was the last time the Creek mouth closed and was mechanically opened due to water quality. During the 2008 closure water quality was not the issue, but the flooding of critical infrastructure was the trigger to open the mouth.

After gaining a permit from the Department of Lands, the Creek entrance was mechanically opened on the 15th August 2008

- The Nambucca River Users Group held a 'Clean Up Our River Day' on November 23rd 2008. There was a considerable amount of garbage collected from the banks and in the Nambucca River.
- Council joined a joint initiative of the Local Government and Shires Association of NSW and NSW Water Directorate to save 10 000 mega litres of water by July 2010.

The project highlights Councils commitment to environmental sustainability with 55 other councils state wide.

More information on the LGSA website at:
www.waterloss.lgsa.org.au

- Phase two of the Newee Creek Water Quality Monitoring Project was completed with the final report released March 2009.

The findings indicated that most of the water samples collected were outside the acceptable range of ANZECC 2000 guidelines for Fresh and Marine Water Quality. It is noted that the greatest bacterial contamination was measured just upstream from the confluence of Newee Creek with the Nambucca River.

The water quality in the Newee Creek catchment strongly suggests that faecal contamination is occurring and is impacting on receiving waters, particularly in wet weather.

The results confirmed phase one results that there is a 96% faecal contamination from herbivores and up to 4% derived from human sources downstream of the residential area of Newee Creek.
- Council was represented with 3 delegates attending 17th annual Coastal Conference in November 2008 in Wollongong. The main themes discussed were; climate change, sea level rise, coastal development, coastal management, estuary management and natural resource management.
- Council was represented with 1 delegates attending the Floodplain Management Authorities of NSW 49th Annual Conference hosted by Albury in February 2009. The main theme was 'One Floodplain, One Unified Approach'. Other points of discussion were; mitigation, planning, climate change, risk management, environmental values and management for our floodplains and environmental water for flooding.
- A 240 000 L rainwater reuse tank was purchased for instillation at Council's works Depot to reduce the use of potable water for road construction and maintenance.
- Ongoing provision of 'doggie poo' bags and waste bins at popular parks and Shire walks to reduce the amount of dog waste entering the Nambucca River.



Deep Creek Mouth
Photo NSC



Deep Creek at Hyland Park
Photo NSC



Cow Creek
Photo NSC



Mechanical opening of Deep Creek
Photo G. Meyers



5.0 Biodiversity

5.1 INTRODUCTION

'Biodiversity' is defined as the variety of life forms found within an area, such as the different plants, animals and micro-organisms, the genes they contain, and the different ecosystems in which they are found and form part of.

The biodiversity of an area is constantly changing and is enhanced by genetic change and evolutionary processes, and is reduced by extinctions and habitat degradation.

It is important to conserve biodiversity to protect the life-support systems on earth. These systems include; fresh water provision, climate regulation, the creation of soils, and the natural disposal of pollutants. They are fundamental to our quality of life and our economy.

The climate and geographical lay out of the Nambucca Shire results in a diverse range of sub-tropical and temperate faunal and floral communities, and the conservation of this biological diversity is essential to the health and productivity of the LGA.

Clearing for agricultural purposes since the 1800's has greatly altered the Shire's vegetation. The main

areas are along the flood plains and the coastal fringe. The riparian zones are vital to the functioning of stream ecosystems, however the majority of these areas of emergent aquatic, semi-aquatic and over and understorey plants within the Shire have been extensively altered since European settlement.

Due to their accessibility, the riparian zones of the region were originally cleared for their high quality timber, particularly red cedar. The Cedar getters were followed by the pioneers who extensively cleared the alluvial floodplains for agriculture.

Weed infestation into remnant vegetation communities in the Nambucca Shire are of an increasing concern. The main source of these weeds are from urban gardens, where they establish, dominate and then escape into neighbouring green space land where they once again dominate the native vegetation.

The loss of essential sea grasses in the Nambucca River and Deep Creek from sedimentation and damage from boats is cause for concern as these seagrass beds are essential fish breeding and nursery grounds.

5.2 PRESSURES ON OUR BIODIVERSITY

- Noxious weeds
- Land clearing
- Stormwater pollution
- Fragmentation of remnant bushland
- Changes to native vegetation
- Garden escapees
- Illegal dumping
- Feral animals
- Climate change impacts
- Anchoring by boats
- Invasive aquatic flora and fauna
- Overfishing

Table 5.1 and 5.2 Biodiversity Indicators

Status of Flora and Fauna in Nambucca LGA **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Number of Threatened Flora Species*	14	17	16	16	21	↓
Number of Threatened Fauna Species*	66	65	67	53	74	↓
Number of Endangered Ecological Communities	no data	no data	no data	7	9	↑
Number of Native Fauna Species in Shire	no data	no data	no data	421	441	↑
Number of Native Flora Species in Shire	no data	no data	no data	1018	1086	↑

* Denotes Regional Indicator ** Statistics from Department of Environment, Climate Change and Water(DECW) www.environment.nsw.gov.au

Declared Noxious Weeds under the Noxious Weeds Act 1993 **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Number of Noxious weeds reported for Nambucca LGA*	42	99	98	104	101	↑
Number of weed notices to residents	no data	no data	63	27	25	↑

* Denotes Regional Indicator ** Statistics from Department of Primary Industries (DPI) www.dpi.nsw.gov.au



Gordon Park Rainforest Walk
Photo NSC



Blue Tongue Lizard
Photo J Ashby



Deep Creek
Photo J Ashby



Rocky Shore Platform
Photo J Ashby

5.2.1 Noxious weeds

Land invasion by weeds is one of Australia's most serious threats to land degradation and species biodiversity. A weed is considered to be a plant that is growing where it is not wanted or where it was not originally present. Weeds of high priority in the Nambucca Shire are either declared Noxious, Weeds of National Significance (WONs) or considered environmental weeds

Weed invasion into the remnant vegetation communities in the Nambucca Shire is an increasing concern. Weeds are commonly very vigorous and fast growing and can take over native plant communities by competing with them for moisture, light and nutrients. The invasion of weeds can substantially alter the composition of an ecosystem by taking over native flora species and creating undesirable conditions for the native fauna species that rely on them. Weeds declared noxious in the Nambucca Local Government Area are listed at the end of this chapter in Table 5.3.

5.2.2 Land clearing

A substantial amount of cleared land and altered habitat exists within the Local Government Area, which is primarily due to past clearing for agriculture.

OzCoasts (2009) states that the change in the Nambucca River Catchment natural cover is 60% cleared. There is a direct relationship between native vegetation clearance, habitat loss, habitat fragmentation and biodiversity decline. The destruction of vegetation associated with clearing destroys fauna habitat and reduces the genetic plant variation in the area. This genetic variation is necessary for the continuation of endemic native flora species in the area.

Clearing for agricultural purposes since the 1800's has greatly altered the Nambucca Shire's vegetation. Large proportions of the central and eastern regions of the Shire have been cleared as well as along the waterways extending into the west of the Local Government Area. The dominant vegetation systems are moist open forest and cleared land.

Riparian vegetation refers to emergent aquatic, semi-aquatic and over and understorey plants in the zone immediately adjacent to or verging watercourses. Riparian zones are vital to the functioning of stream ecosystems, however the majority of these areas within the Nambucca Shire have been substantially altered

since European settlement. Due to their accessibility, the riparian zones of the region were originally cleared for their high quality timber, principally red cedar. The cedar getters were followed by the pioneers who extensively cleared the alluvial floodplains for agriculture.

Due to the large portion of the Shire being cleared, this has substantially altered the vegetation and associated animal species that originally existed in the area. Environmental characteristics have a major influence on the distribution of animal species, and any changes in the structure or composition of the vegetation will eventually be followed by changes in the animal population.

The size and diversity of habitat will directly influence the fauna in an area. There has been a considerable proportion of land cleared in the Nambucca Shire. While the majority of this land was cleared for agricultural pursuits, clearing has also taken place to permit urban and semi-urban development, forestry and road construction. This has resulted in the loss of areas of habitat and associated fauna species including those of mammals, birds, reptiles and amphibians.

Previous studies undertaken by the Department of Conservation and Land Management, the National Parks and Wildlife Service, the Nambucca Valley Conservation Association and Kendall & Kendall are a good indication of the types of species that may be found and their habitat types (Smith, 1994; Fitzgerald, 1996; Kendall & Kendall, 2003).

The highest diversity of both flora and fauna species occur in the coastal sclerophyll complex which is adjacent to the coast, between Nambucca Heads and Scotts Head. Smith (1994) identified this area as the largest wildlife corridor in the Nambucca Shire. Some of the most significant species identified in this area include the Beach Stone-curlew, Little Tern and Osprey, which are all listed as threatened under the *Threatened Species Conservation Act 1995*.

An inland study of State Forests has been carried out by the Nambucca Valley Conservation Association. The study revealed that the Nambucca Shire provides habitat for a variety of significant fauna species (Table 5.4). The most significant species identified include the vulnerable Pouched Frog, Stephens Banded Snake, Red-Legged Pademelon, Glossy Black-Cockatoo and the Wompoo Fruit-Dove. The

Powerful Owl, which is noted as being dependent on old growth forest, was also recorded. Other important species identified during the study were the Masked Owl, Rufous Scrub-Bird and Koala. The outcomes of this study indicate that a rich biological diversity exists in the area. A full list of native fauna and flora found in the Shire is located on the following website:

<http://wildlifeatlas.nationalparks.nsw.gov.au/wildlifeatlas/watlas.jsp>

5.2.3 Stormwater pollution

Oils from our roads, silt from building sites and unsealed roads and other debris, get washed down our stormwater drains when it rains. These substances increase the nutrient content of the soils and water ways, which pose a problem with native species. These native species normally thrive on the nutrient low soils and mud.

Nutrication of these substrates encourages weeds to grow. Seeds from dumped garden refuse are often carried down the stormwater system. It can be seen in stormwater drains around the shire a prevalence of weed species and bright green algal species adjacent to outlets.

The vast majority of aquatic vegetation types are adversely affected by unnatural flow regimes, erosion & sedimentation, herbicide use, elevated nutrient concentrations and introduced species.

Anecdotal evidence indicates that areas of seagrass have been lost and are continuing to decline in the Nambucca River and Deep Creek. If this is occurring, the most likely causes are excessive growth of epiphytic algae associated with elevated nutrient concentrations, increased turbidity and smothering by sediment

An increase in sediment load in the watercourses of the Shire has resulted in substantial sedimentation. Many fish species, such as the Australian Bass, prefer deep holes, therefore this process is believed to have led to and is continuing to lead to the loss of important fish habitat. Increased sediment within waterways has also been found to smother aquatic invertebrates.

Mangrove forests and seagrass beds are extremely important habitats for commercially and recreationally important fish species, as well as other aquatic fauna. This is illustrated by the fact that 70% (by value) of NSW commercial fish species rely on mangroves for habitat at some stage in their lives (Coastcare and Landcare,

2000). Anecdotal evidence suggests that these areas are continuing to decline. If this is the case, increasing pressure is being exerted on aquatic fauna within the Shire.

5.2.4 Fragmentation of remnant bushland

Very few areas of rainforest exist within the Nambucca Shire. However, there are numerous isolated zones of disturbed remnant vegetation, covering areas of five to fifty hectares, mainly in the upper catchment and in the east of the Shire. One important vegetation system is the expanse of coastal sclerophyll complex that occurs along the coastline.

The Department of Conservation and Land Management provided an initial evaluation of the conservation significance of remnant vegetation for the eastern section of the Shire (Smith, 1994). The report investigated the significance of this area for vegetation conservation and endangered fauna habitat. The investigation identified that there are a number of vegetation types and remnant areas that have a high degree of local to regional significance (refer Figure 5.1).

With regard to the detailed planning areas, four contained remnant vegetation of high to very high significance and one had a remnant of only moderate value (the area to the south west of Macksville). The areas of high value included:

- The area to the south of Scotts Head
- The areas north and south of Valla Beach
- The area bounded by Warrell Creek the Ocean and Nambucca River
- The floodplain area to the north east of Macksville

5.2.5 Changes to native vegetation

DECCW (Conservation Partners Program) note that there is currently 822.22 ha of land subject to conservation agreements in the Shire, these include 4 wildlife refuges and one voluntary conservation agreement. Table 5.5 lists the other 29032.02 ha of protected areas in the Shire.

5.2.6 Garden escapees

Weeds that are intentionally brought into an area usually from overseas or from other states or territories for use in gardens often spread and out-compete native plants. Garden escapees usually produce more seed and grow faster than native species and thrive on excess nutrient levels found in disturbed soils.



Garden Escapee-
Nasturtium, (*Tropaeolum majus*)
Photo Google



Garden Escapee-
Lantana, (*Lantana sp.*)
Photo Google



Garden Escapee-
Lantana, (*Lantana camara*)
Photo Google



Illegal dumping of garden waste
Photo Google



Feral Pig
Photo Google



Bushfire
Photo Google



Weed
Angel's trumpet (*Brugmansia aurea*)
Photo Google



Seagrass with boat propeller
Photo Google

5.2.7 Illegal dumping

Like noxious weeds and garden escapees, the dumping of ones garden prunings and other green waste behind houses in Council reserves, national parks, state forests, waterways, bushland and in hazard protection zones is not only illegal but can help spread weeds into these areas.

5.2.8 Feral species

Feral species are those fauna that have been introduced for the control of pests (eg Cane Toad), domestic animals that have been discarded or escaped and gone wild (eg cats, dogs) and animals that have been released for recreational hunting (eg rabbits, foxes). Feral animals can degrade the habitats of native flora and fauna species. They compete with and prey on many of our endemic fauna species, transmit disease, cause erosion, damage property and spread weeds.

5.2.9 Fire

Bush fires are a common occurrence in Australia, and as a result, many Australian native plant species are adapted to, and even rely on, these events. However controlled burning as well as accidental and naturally occurring fires can have major impacts on the number and distribution of species. High frequency and high intensity fires can cause a total change in ecosystem type. This can result in a substantial loss of habitat and associated species. The Nambucca Shire is generally considered to be an area of moderate to high fire risk, especially during the period from September to December.

Frequent burning of habitat can be beneficial to some animal species and detrimental to others, such as ground dwellers or those that cannot escape fire quickly. Studies indicate that most animals survive low to moderate intensity fires by moving beyond the fire edge or taking shelter. Serious depletion of food supplies rarely follows low intensity fires because the area is generally a mosaic of burnt and unburnt ground. Burning may even be beneficial to some species by promoting succulent regrowth. Intense bushfires however, may have major short term effects due to animal species not being able to avoid the fire and exposure of the survivors to starvation and predators.

5.2.10 Climate change impacts

There is reasonable agreement among scientists that climate change is already affecting species and ecosystems, and

will continue. There is much uncertainty about climate change and how individual species and ecosystems might respond to climate change in the future. Some documented studies suggest even moderate climate change will cause substantial changes in species distribution, reproduction, growth and interactions. Furthermore, the impact of other stresses (habitat clearing, grazing, water extraction) will greatly reduce the ability of biodiversity to adapt to climate change naturally.

Climate change would pose a threat to any species found in areas that are near the upper limit of their temperature range or in areas from which they cannot migrate. Under climate change, the distribution of many species and ecosystems is likely to change.

The Nambucca Shire sits mainly in the middle of the North Coast Bioregion with the far west of the shire sitting in the New England Tableland Bioregion. The position of Nambucca Shire in the North Coast Bioregion will mean that climate change on species may not be such a major impact.

5.2.11 Anchoring by boats

Seagrasses are fragile habitats that are in slow decline in NSW estuaries. This habitat provides shelter and food for marine organism populations, and is an important nursery ground for fish.

Seagrass beds are a good fishing ground and many anglers access these beds by boat. There is a large risk of damage to this ecosystem by way of anchoring and propeller/keel damage via contact with the beds.

Seabeds unlike kelp beds do not regenerate fast and once damage is done through anchoring or grounding the seagrasses die leaving a denuded area devoid of life.

5.2.12 Invasive aquatic flora and fauna

Aquatic vegetation is another important habitat type within the Local Government Area. This type of vegetation oxygenates the water, accumulates and recycles nutrients, stabilises sediments and provides food and habitat for fish (particularly juveniles), waterbirds and other aquatic organisms

OzCoasts (2009) in conjunction with West *et al* (1985) note that there was 0.779 km² of mangroves, 0.224 km² of seagrasses and 1.034 km² of saltmarsh communities in the Nambucca River Estuary and DPI Fisheries, note there is 1.49 km² of mangroves, 1.91 km² of Saltmarsh flats and 0.64 km² of

seagrass in the Nambucca River catchment in the reporting year. It is also identified that there is 0.008 km² of mangroves, 0.007 km² of seagrass and 0.604 km² of saltmarsh in the Deep Creek catchment. No mangroves, seagrasses or saltmarsh has been formally mapped for Oyster Creek.

The Nambucca River Estuary Inventory states that the Grey Mangrove, *Avicennia marina*, the River Mangrove, *Aegiceras corniculatum*, and the Blind-your-eye Mangrove, *Excoecaria agallocha*, occur within the Nambucca River catchment. The inventory also indicates that seven seagrass or related plant species are found in the Nambucca River.

The Grey Mangrove was the only species recorded in Deep Creek by West *et al* (1985), however a number of River Mangroves were identified in the creek during a local aquatic survey carried out by Coastcare and Council in 2000. Seagrass was also identified in Oyster Creek during the survey.

There is a paucity of information available on the aquatic flora in the freshwater sections of the catchments in the Shire. However, it has been reported that the Nambucca River is the only river on the Mid North Coast to be affected by major infestations of *Salvinia*, Water Lettuce and Water Hyacinth in the last 5 years.

It is not documented if there are any invasive marine aquatic fauna found in the Shires waterways, although there is evidence to suggest there has been some Pacific Oysters (*Crassostrea gigas*) found in the Nambucca River.

Invasive freshwater aquatic fauna found in the Shire include; *Gambusia* (*Gambusia holbrooki*), and may include Goldfish.

5.3.13 Overfishing

The Nambucca River supports a diverse range of species. This diverse variety of species may be largely attributed to the location of the estuary between the biogeographical zones of the Eastern Tropical Zone and the Eastern Warm Temperate Zone. This is supported by the fact that many of the fish species listed are at their southern (eg Mangrove Jack) or northern (eg Australian Salmon) distribution limits. Many of the fish, crustacean and mollusc species found in the local waterways are commercially and recreationally important. Such species include bream, whiting, flathead, mullet, Australian Bass.

Aquatic macroinvertebrates are an essential component of aquatic ecosystems as they provide a valuable food source for larger fauna species. A

benthic macroinvertebrate survey of the Nambucca River found a high diversity and abundance of organisms within intertidal mudflats. Detailed results of the survey are outlined in the Nambucca River Estuary Inventory.

Commercial fishing has taken place in the Nambucca estuary since the late 1800's. The licensed commercial fishers currently operating mainly target mullet, bream, flathead, blackfish, whiting and crabs. Recreational fishing is a popular activity in the waterways of the Nambucca Shire, however the combination of commercial and recreational fishing activities is exerting increasing pressure on the fishery. Anecdotal evidence suggests that numbers of recreational and commercially important fish, crustacean and mollusc species are declining.

DPI (Fisheries) note that there are 5 threatened species that may inhabit the Shires waterways and adjacent offshore areas, these are: Grey Nurse Shark (*Carcharias Taurus*), Green Sawfish (*Pristis zijsron*), Southern Bluefin Tuna (*Thunnus maccoyii*), Great White Shark (*Carcharodon carcharias*), Black Cod (*Ephinephelus daemeli*).

5.3 RESPONSES TO THESE PRESSURES

5.3.1 Noxious weeds

The Nambucca Shire has 101 plants that are declared Noxious under the Noxious Weed Act 1993. Early detection and intervention of new weed incursions is of highest priority to ensure new species are not established within the area. An example of this is the successful eradication of the only known infestation of the Class 1 aquatic weed Water Lettuce (from a dam in the Nambucca area). There have been no known infestations of any Class 1 or 2 Noxious weeds identified to be established throughout the Nambucca Shire throughout the 2008 – 2009 year.

The Nambucca Shire has representatives on the North Coast Weeds Advisory Committee (NCWAC), which cooperatively develops regional weed management plans in conjunction with all stakeholder groups that operate within the region. The NCWAC has recently developed and endorsed the Northern Rivers Invasive Plants Action Strategy in conjunction with the Northern Rivers Catchment Management Authority (NRCMA), which provides the framework for weed management across the Northern Rivers CMA region and endeavours to meet or exceed the management requirements of the NSW invasive species plan



Deep Creek Wetland and Mangroves
Photo J Ashby



Invasive Aquatic Species,
Pacific Oyster (*Crassostrea gigas*)
Photo DIP Fisheries



Threatened Species,
Grey Nurse Shark (*Carcharias Taurus*)
Black Cod (*Ephinephelus daemeli*).
Photo DIP Fisheries



Gastropods washed up on Shelly Beach
Photo J Ashby



Weed
Bitou Bush (*Chrysanthemoides monilifera*)
Photo DPI



Weed
Groundsel Bush (*Baccharis halimifolia*)
Photo DPI



Weed
Water lettuce (*Pistia stratiotes*)
Photo DPI



Green team at Warrell Creek
Photo Green Team

Council receives grant funding from the NSW Department of Primary Industries – Agriculture through the Noxious Weed Advisory Committee for inspectorial and on ground control of some declared Noxious Weeds. Other funds are also sourced from the Department of Lands for weed control within Crown Reserves.

During the reporting period Council's Noxious Weed Inspector has implemented a widespread management program of Bitou bush and other weeds within the Council managed coastal reserve system. Bitou bush is a Weed of National Significance and poses a high threat to this fragile ecosystem. Other emerging weeds posing a threat to this coastal system in the Nambucca include environmental weeds such as Glory Lily, Lantana, Winter Senna and Morning Glory Species. Council utilised a variety of techniques in conjunction with other stakeholder groups, such as Dunecare and DECC (NPWS) programs, to maximize weed management programs through a coordinated approach.

Council is involved in the monitoring of pandanus trees, an iconic native species that is located along the coastline for a plant hopper that has the potential to kill these species if introduced into the area.

During the past year Council's Noxious Weed Inspector has worked in conjunction with the Northern Rivers Catchment Management Authority to implement a widespread weed control program along 26 km of riparian zone in the Taylors Arm / Burrupine area, in the head waters of the Nambucca riparian system. Weeds targeted include Madeira Vine, Angels Trumpet, Camphor laurel and Cape Ivy.

Council participates in an early detection and intervention program for aquatic weeds throughout the shire, in conjunction with NSW DPI – Agriculture representatives. This program has identified high priority water bodies throughout the shire that are part of a regular monitoring program to ensure that aquatic weed incursions are identified early and managed accordingly, prior to their spread within the region.

Council advocates the Bushland Friendly Nursery Scheme that was developed in conjunction with the North Coast Weeds Advisory Committee, that which identifies exotic plant species have the potential to become weedy and offers a list of desired alternative local native species that do not have weedy traits.

Herbicides used for weed control are selected on their environmental impact, with preference for low impact, such as the "Frog Friendly" glyphosate product Weedmaster duo used wherever possible. Low impact techniques such as stem injection, and cut and paint control are also utilized where applicable.

Areas of high conservation value are of greatest priority for weed control, with various Ecologically Endangered Communities and declared Threatened species placed above other areas within the shire to secure the future of these species and high conservation areas.

Throughout 2008-09 there were 801 property inspections conducted throughout the Nambucca Shire as well as an aerial inspection program that covered approximately one third of the Shire. There were a total of 25 weed control notices issued to land owners/occupiers, with vast majority of land holders found to have effective weed management programs implemented within their lands.

Education and extension programs including media releases, distribution of publications (including Noxious Weed Guides published by the NCWAC, and the recently re-published Bushland Friendly Nursery Scheme) and attendance by Council staff to local field days assists in raising the public's awareness of Weed threats within the local area. Council's Noxious Weed Inspector also assists land managers with the development and implementation of weed management plans, with higher priority placed on Class 1 to 3 weeds.

Weeds of pasture production systems including Class 4 weeds such as Fireweed and Giant Parramatta Grass are endemic through many areas of the Shire, with many land managers investing large amounts of capital to ensure their production systems remain viable and are not overrun by these highly invasive weed species.

Other weeds that are present within the Shire include Groundsel Bush (Class 3), which is a large seed producing plant (up to 1.5 million seeds per mature plant), with a seed that is transported by wind and water. The southern range of this invasive weed species is currently thought to extend no further than the Mid North Coast of NSW, therefore effective control programs (especially along main arterial roads and the rail corridor) are vital in containing this species to its current range

The Nambucca Shire council also implemented a widespread noxious weed control program throughout land under its management, including roadside and other public reserves.

Council also received funding from the Department of Lands to manage Bitou and Groundsel bush within council managed Crown reserves. Other species that were targeted through councils reserve systems included Lantana, Camphor laurel, Privets, Broad Leaf Pepper trees and aquatic weeds such as Salvinia and Water Hyacinth.

Scotts Head Dune Care Group remains active in weed management and rehabilitation of the coastal vegetation. Works are supported by volunteers and some paid work from the Scotts Head Reserve Trust

Weed Management work by the Ngurrala Aboriginal Corporation Nyambaga Green Team is a core activity. Various projects have helped reduce weed infestations in riparian zones.

5.3.2 Land clearing

The Native Vegetation Act 2003 regulates the clearing of native vegetation on all land in NSW except for National Parks and other conservations areas, State forests and reserves and urban areas. Under the Act, landholders may only clear native vegetation provided they have reached an agreement with their local Catchment Management Authority (CMA) on suitable offsets.

Clearing of re-growth younger than 1 January 1990 can take place without approval. In addition, a wide range of routine agricultural management activities (such as weed and feral animal control) can continue without approval. Invasive native scrub (woody weeds) can also be managed to restore agricultural value and prevent land degradation under an agreed code of practice (Department of Natural Resources, 2006).

5.3.3 Stormwater pollution

Please refer to section 4.2.6 & 4.3.6 in Aquatic Systems – Water.

5.3.4 Fragmentation of remnant bushland

In 2005/2006, Council in a joint funding exercise with the Northern Rivers Catchment Management Authority, undertook Urban Habitat and Biodiversity Enhancement projects in Nambucca Heads and Scotts Head. Revegetation, signage, access improvement and weed eradication

works were carried out. Both proposed projects had a strong community involvement.

The Regional Forest Agreement process resulted in a substantial area being identified as containing important flora and fauna habitat. Some of these areas were subsequently declared National Parks and Nature Reserves, including the Valla Nature Reserve. The Valla Nature Reserve is located to the south of the main residential area in Valla Beach and covers an area of 30.29 ha. The National Parks and Wildlife Service described the reserve as a small remnant of mature age class moist Blackbutt and Tallowood forest which is known Koala habitat.

Valla Nature Reserve is an area of littoral rainforest listed as an Endangered Ecological Community (EEC) under the Threatened Species Conservation Act. (Table 5.6 lists the 9 EEC's in Nambucca Shire). In a partnership with the Department of Environment and Climate Change, Nyambaga Goori Green Team and Valla Beach Bushcare group a restoration project was undertaken from June 08. Works included weed control with eradication of lantana, bitou bush, morning glory and many other weeds. Valla Nature Reserve features large Brush Box, strangler figs, woody vines, epiphytes and ferns and is home to rainforest birds, gliders, possums, flying foxes and other native animals.

In July 07 the Crosswinds Wetland Reserve under the *Community Economic Development Project* had a face lift. The aim of the project was to encourage travellers to stop and rest in Macksville and enjoy the parks and other facilities on offer.

The first step of the project was to identify all of the environmental species within the reserve, building on the previous work of several community groups. The second was to build a boardwalk and interpretive signage to encourage visitors to appreciate the river and emphasising the importance of the wetland bird and wildlife that exists in the valley. Seating and a carpark were also installed

5.3.5 Changes to native vegetation

Each year more and more land becomes protected and rehabilitated back to native vegetation. Forests NSW is the regulator of state forests and continue to provide for conservation areas. DECCW (NPWS) provides for crown land and reserves. Whilst no new land was preserved in the Shire during 08/09 many new areas around the state was added to their inventory.



Waves at Shelly Beach
Photo J Ashby



Pelican at Macksville Boat Ramp
Photo J Ashby



Pebbles on Valla Beach
Photo J Ashby



Kookaburra at Hyland park
Photo J Ashby



Feral Species
Cane Toad Frog or Toad?
Photo DECCW



Feral Species - Indian Myna
Photo Jamberoomynas



Land clearing on private land
Photo NSC



Structure blocking fish passage
Photo WetlandCare Australia

5.3.6 Garden escapees

Just one escaped invasive garden plant - Lantana - now degrades over 4 million hectares of Australia's environment. Although many garden escapees are from neglected gardens, cemeteries and 'unclean' fill, many are still sold in NSW nursery's. table 5.7, lists the top 10 species still available for sale in NSW.

Bushland areas adjoining peri-urban settlements should be actively and regularly searched by experienced botanists and trained community volunteers to detect and eradicate newly naturalised species that have already escaped from the garden.

Table 5.7 The ten most serious invasive garden plants currently available for sale by nurseries in New South Wales

Common name	Species name
Banana passion fruit	<i>Passiflora tarminiana</i> (= <i>P. mollissima</i>)
Broom	<i>Cytisus scoparius</i>
Cat's claw creeper	<i>Macfadyena unguis-cati</i>
Glory lily	<i>Gloriosa superba</i>
Holly leafed senecio	<i>Senecio glastifolius</i>
Hybrid mother of millions	<i>Bryophyllum daigremontianum</i> X <i>B. delagoense</i>
Lippia	<i>Phyla canescens</i>
Madeira vine	<i>Anredera cordifolia</i>
Mother of millions	<i>Bryophyllum delagoense</i>
Yerba de hico tea	<i>Hygrophila costata</i>

Groves *et al* (2005) recommends that increased resources should be provided to advance the awareness of the Australian community to the negative impacts that many established and emerging weeds are having on natural and agricultural ecosystems and will have in the future, focusing especially on those already growing in private and public gardens.

5.3.7 Illegal dumping

New plants can easily seed from dumped green waste cuttings which, if left in environmentally sensitive areas, can destroy delicate plant and animal life balance.

Council's Ranger has been investigating several known dumping sites in the shire. Residents that back onto bushland are urged to deal with their green waste within proper channels. Council rolled out a weekly green waste service for urban and some rural residential areas. Council's waste facility only charges \$5.00 per car load (up to 100 kg) for green waste. This green waste is composted and resold.

5.3.8 Feral species

Council is not actively involved with feral animal populations, although cat traps are hired out to the community for the capture of stray felines. NSW Forests have a fox/dog baiting policy and 1080 baits are placed in hotspots within State forests.

Council provides information from other state and federal departments on programs, such as the DECC 'Frog or Toad?' project, to help identify cane toads from our native frogs.

The Indian Myna is an introduced species that poses a threat to native animals and plants. The myna is a scavenger that lives in small flocks and takes over breeding hollows of native birds and poses a threat to their long term well-being. The mynas have successfully taken over native territory and driving native species out and has become a major threat to the diversity of Australia's bird life. Mynas have the ability to occupy a solid band of territory stretching from the east to west coast of Australia within 20 years.

Indian Myna numbers have been increasing in the Shire in recent years and have posed a threat to the local environment. Mynas are fond of open areas, such as school playgrounds, empty fields and suburban backyards. They are quite aggressive, roost in large numbers and are attracted to any food source, especially dog food left out. To help stop these birds from taking hold in an area the community must refrain from feeding any birds

Last year Council in conjunction with Nambucca Valley Landcare, in partnership with Bellinger and Coffs Landcare were successful in applying for Environmental Trust funding to implement the Project across the Nambucca, Bellingen and Coffs Harbour LGA's. for a successful Indian Myna Trapping Program. The Indian Myna Control Program is continuing, with a new Indian Myna Project Officer, Tien Pham employed part-time to coordinate activities over the next 12 months. The main objectives of the project are to:

- Co-ordinate and service community groups, individuals and government agencies in Indian myna trapping and control activities.
- Assist with the preparation, review and monitoring of future strategies in Indian myna control in the LGA's of Nambucca, Bellingen and Coffs Harbour
- Monitor and collect data relating to bird locations and numbers within the designated area

- Collect, record and map data collected on birds numbers and impacts of trapping/eradication activities
- Develop promotional materials, documents and website access for a public awareness program
- Develop and deliver education and information workshops relating to the Indian myna project

Information workshops will be held in various locations throughout the project area in July and November 2009.

The following topics will be covered:

- Indian Myna Profile - biology and behaviour
- Correct species identification/ Indian myna look-a-likes
- Impacts of Indian mynas
- Indian myna control – trapping and other strategies
- Establishing an effective trapping network in your community

Council is required to supplying printed material, traps and gas for the program.

5.3.9 Fire

A project between Council, NSW State Forests, the National Parks and Wildlife Service, the Rural Fire Service and the Nature Conservation Council developed a series of Bushfire Threat Hazard Maps for the Nambucca area. The hazard maps factored in various sources of information, such as Council's environmental protection zones, and a level of bushfire hazard was consequently decided upon. A Risk Management Plan that aims to control the likely spread of bushfires and address response has been completed and ratified by a coordination committee comprising State Agency officers and other stakeholders. It is anticipated that the plan will afford an adequate level of protection to areas possessing significant biodiversity.

5.3.10 Climate change impacts

The following response is adapted from *Climate change impacts on biodiversity in Australia*.

Actions that may make species and ecosystems respond better to climate change may be taken. Such actions could include planning and management interventions that would better protect our biodiversity and help build its resilience (ability to cope) to climate change.

Australia has a well-established National Reserve System that uses protected areas (such as national parks and other types of conservation areas) to conserve our biodiversity. Protected

areas are formally managed for this purpose, and are effective where they can reduce threatening processes. Protected areas can also be used to facilitate natural adaptation of biodiversity to climate change. Protected areas can be networked and linked within regions and over the whole country. In order to help adaptation to climate change, such networks would need to incorporate the different climatic gradients (eg in higher-relief landscapes) and increase the number of species that are represented in the protected areas.

The resilience of an ecosystem is a measure of its ability to withstand and recover from environmental stresses and disturbances. The healthier an ecosystem is, the greater its resilience. As climate change will cause species distributions to shift, resilience also includes the capacity of a species to move to other localities. To improve the resilience of ecosystems we need to reduce the pressures on them. This can include reducing weed incursions and fragmentation of vegetation by land clearing. An improved resilience will increase the likelihood that species living in the area will survive climate change

EnviTE is enhancing wildlife corridors, that expand and connect vegetation communities essential to the movement of native species. The project allows native species to adapt to the impacts of climate change, in facilitating movement from areas that may be unsuitable to new locations suited to above average survival.

Wildlife corridors are important for migratory species and helps protect and maintain biodiversity of an region. These corridors provide landscape connections between larger habitat areas that are important for migration, colonisation and interbreeding of species.

Several landowners near Nambucca Heads are involved in this project. The project helps land managers and interested groups to develop and implement site action plans to protect and manage native vegetation. The project aim to strategically plant native trees to expand habitat and improve connectivity that inturn provides habitat for many threatened species.

EnviTE's project is part of the NRCMA Key Corridor Connections Project that helps makes a significant contribution to improving connectivity and biodiversity in identified strategic habitat areas.



Rural Fire Service burning off
Photo NSC



Stinkhorn Fungi, Gordons Park
Photo J Ashby



Gumma Wetland
Photo WetlandCare Australia



Coastal Saltmarsh EEC
Photo DECCW



Fishing at the V Wall, Nambucca
Photo Nambucca Tourism



Drift Wood on Valla Beach
Photo J Ashby



Littoral Rainforest EEC
Photo DECCW



Swamp Sclerophyll Forest EEC
Photo NSC

5.3.11 Anchoring by boats

Boat users need to be aware of the importance of seagrass beds in the health of an estuary. Boat users should not anchor in seagrass beds and be mindful of running their boats into shallow areas over seagrass.

It is an offence under the *Fisheries Management Act 1994* to cut, remove, damage or destroy marine vegetation on public water land, or on aquaculture lease, or on the foreshore of any land or lease

5.3.12 Invasive aquatic flora and fauna

Refer to Noxious weeds 5.3.1 for freshwater flora. For invasive aquatic fauna, NSW DPI Fisheries recommends that the management of issues such as water quality, environmental flows, fish passage and snags can maintain or return conditions to those that best suit native fish.

This improves the ability of native fish to compete and creates conditions less suitable for alien species. The spread of alien species has often been associated with their use as bait. For this reason, use of live fish bait is now illegal in NSW. Improved education is also needed to avoid the accidental release of these species.

5.3.13 Overfishing

In recent years NSW DPI (Fisheries) has undertaken extensive fish fauna surveys in waterways along the NSW coast. In the Nambucca Shire, surveys have been conducted in the Nambucca River and Deep Creek. Surveys have primarily focused on lower food chain species (non-commercial), with results expected to indicate variations in species diversities and abundances at different times and under different conditions. This information will add to the limited knowledge of the local area's fisheries resources and is available from NSW DPI (Fisheries) website:
www.dpi.nsw.gov.au/fisheries.

While the effects are difficult to quantify, the widespread promotion of catch-and-release fishing in recent years may reduce pressure on recreationally targeted species in the local area. An increase in these species would have numerous positive effects on the health and economy of the local area

5.4 A SNAP SHOT OF 2008/09

- Nambucca Valley Landcare Inc. hosted many field days, workshops and fairs during the reporting year.
 - In July 2009 was the Native

Propagation Workshop that covered seed collection, extraction, treatment and potting up.

- Nambucca Valley Landcare received approx \$300,000 in funding in the reporting year aimed at projects dealing with regeneration and education for the Nambucca Valley, Projects included:
 - Newee Creek River Reach Plan completed year 2 - 9 km river protection fencing,
 - Upper Taylors Arm River Reach Plan completed stage 3 – 2 km of new fencing with water points and began stage 4
 - Small grants for landowners for bank erosion and riverbank restoration in North Arm, Taylors Arm, Deep Creek
 - The Valla Lions beach access project
 - Gordon Park weed control and walk way restoration
 - Wetland projects in Newee Creek, North Arm and Gumma looking at water level and stock control
 - A 2 year Indian Myna Project started beginning of 2009, will be spending \$60 000 in the first year.
 - Continued funding of landholder voluntary revegetation
- WetlandCare Australia attained funding through the Caring For Country Landcare Program to increase awareness and implementations of best practice floodplain management in the Nambucca and Bellinger Catchments.

The program will run over 3 years and will include on-ground works demonstrating best practice floodplain management.

Wetland care also held a landowner wetland workshop information session for expressions of interest for landholders in the Deep Creek, Valla area in April 2009. The information session concentrated on the current Priority Wetlands funding opportunity in the area.

- National Tree day on Sunday 27th July 2008 was celebrated by the Macksville Leaders and Guides by planting 24 trees at Gumma Reserve. Valla Nursery and Macksville Community Gardens supplied the trees.

- The DECCW NPWS ran a endangered species drawing competition during August 2008. This competition was to increase public awareness to Nambucca's disappearing local threatened species. Leonia Gale, CEO of NPWS Foundation, said there had been no confirmed sightings of the brush-tailed phascogale, spotted-tailed Quoll or the Osprey in the Nambucca Area for several years. The best 600 drawings will be displayed in the Australian Maritime Museum.

Despite Ms Gale's statement, an Osprey couple were seen nesting on a power pole near Wrights Corner on the Pacific Hwy in May 2009. (Photo top right)

- The Mid North Coast Wildlife Information and Rescue Service (WIRES) rescued 5332 animals in the 2008/09 reporting year from Woolgoolga to Euangai Rail. Most animals were affected by traffic, domestic pets and intense weather. There are over 200 volunteers with 25 being from the Nambucca Shire area.

- In September 2008 a local Macksville Student found a dead tagged Australasian Gannet on Valla Beach. The find sparked an interest and it was found that the bird was tagged in 1990 by the Department of Conservation in New Zealand at White Island.

The Gannet had travelled more than 2352 km. This find is significant as it helps research the movements and habitats of New Zealand and Australian migratory birds.

- On the 10th October 2008 the Littoral Rainforest and Coastal Vine Thickets of Eastern Australia was listed as a critically endangered ecological community under the *Environment Protection and Biodiversity Conservation Act 1999*. Nambucca Shire has remnants of this EEC.
- Council was successful in securing a 2 year Area Assistance Funding Grant from the Department of Community Services to continue developing the community garden site at Macksville, to explore long term sustainability and develop integrated marketing strategies for a future sustainability plan.
- Scotts Head Public School had a plant biodiversity open day on December 12th 2008. Students

lead visitors on guided walks through the grounds to lead visitors on guided walks through the grounds to

demonstrate their knowledge of the plant species and to show off the new species signage. There are 50 trees of 12 different species all identified within the school grounds. A special tree in the grounds is the Aleppo pine, which is a direct descendant of the Gallipoli Lone Pine.

The same week the Scotts Head Public School, student Representative Council won approval and Council's assistance to erect three warning signs for motorists to look out for wildlife to prevent roadkills. The students designed the signs with the slogan 'Look Out Wildlife About'. The signs feature a Koala, Kangaroo and an elephant so motorists would actually see and read the sign. The signs which were erected in April raised some comments in the local papers, it is not known if the signs have helped in the number of road kill on the Scotts Head/Grassy Head roads.

- The EnviTE project discussed in 5.3.10 is underway with landowners from Eungai Creek keen to get involved. A field day on June 26th 2009 was held to assist landowners with environmental restoration projects on their properties. The Yarrahappinni escarpment corridor provided a key habitat for many threatened species including the vulnerable Wompoo Fruit-dove and the grey-headed fox whose population has declined by 30% in the last ten years.
- The Nyambaga Green Team (NGT) are an enthusiastic group of local indigenous people – comprising a mixture of youth and vitality, with some senior more experienced, highly qualified supervisors. All members of the NGT are undergoing training in Conservation and Land Management, and are well versed in the rehabilitation of degraded areas and restoration of environmental sites. The NGT provides role models for the youth in our community and receives support from the Elders, providing a positive approach to teaching young people how to improve our environment and develop a great work ethic.



Osprey building a nest, Wrights Corner
Photo J Ashby



Sea foam on Valla Beach
Photo J Ashby



Hibiscus
Photo J Ashby



Grevillea
Photo J Ashby



Green Tree Frog
Photo J Ashby



Fishing, Nambucca Heads
Photo Nambucca Tourism



Underwater Biodiversity off
Nambucca Heads
Photo J Ashby



Heath Ecosystem
Photo NSC

The team ranges in age and competencies. Current workers in the team have achieved certificates II, III, IV and Diploma levels in Conservation and Land Management.

The Nyambaga Green Team remains employed by way of contract works from NRCMA, DECCW, DPI, Local Government, private landholders and commercial interest. Funding also is won from submissions to all available providers.

It is the team's intention to introduce and implement a strategic plan of management to prevent further degradation in sections of the Nambucca Catchment and to assist with the rehabilitation of the river bank and protect the biodiversity in the area. This work is being carried out through:

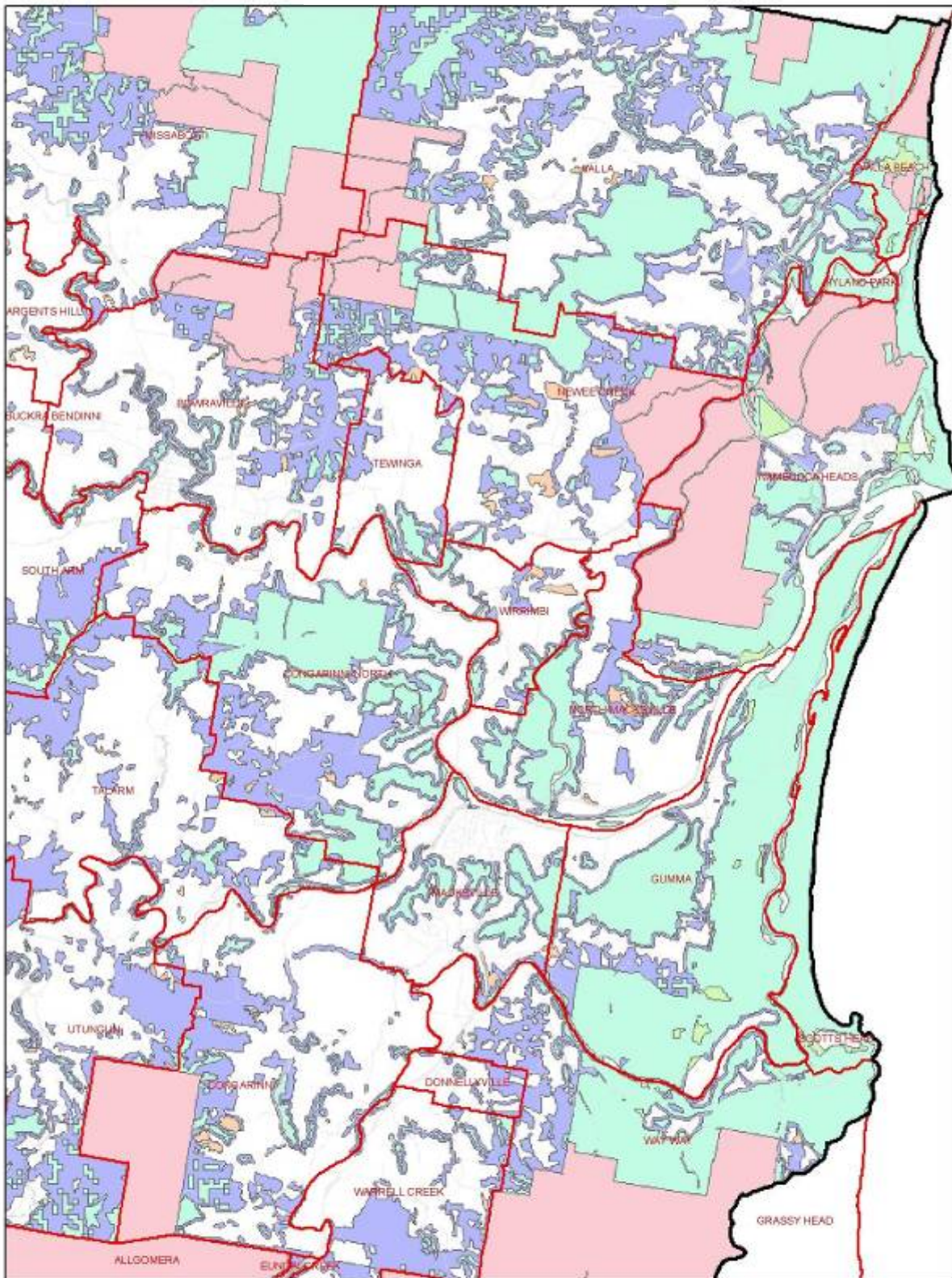
- Weed management projects. Sponsored by NRCMA and DECCW (NPWS)
- Removal of Gross Pollutants. Sponsored by Nambucca Shire Council, Department Environment and Climate Change and Partnership with NHLALC
- The Construction of an Estuary Boardwalks and infrastructure. Sponsored by Nambucca Shire Council and RTA. Cultural recommendation through signage and brochures. (Envirofund)
- Mangrove Rehabilitation (Envirofund)
- Rock Fillet Construction (Barefoot Radler Beer Company)
- Beach access tracks (Caring for our Country)
- Weed management projects. beach dunes (Caring for our Country)

During the reporting year the Nyambaga Green Team completed many projects These included:

- Weed Management work:
 - Thumb Creek – 1 km removing Small leaf Privet
 - Taylors Arm – 3 km
 - North Macksville Nursery Road - 2.5 km

- North Macksville Pacific Hwy - 3km
- Deep Creek –5 km removing Camphor Laurel
- Missabotti 0.5 ha removing Bamboo
- Forest Road – 0.5 ha
- Cow Creek – 1 ha
- Valla Reserve – 5 ha
- Jagun Reserve – 10 ha
- Yarriabinni Reserve – 0.5 ha this is an EEC (Ecological Endangered Community)
- Middle Head – 6 ha
- Tallowood School – 0.5 ha
- Beach pollutant clean up
 - Nambucca heads
 - Scotts Head
 - Valla Beach:
- Mangrove Rehabilitation, rock filllets, Gumma Mangroves at Boultons Crossing:
- Boardwalk construction – 400 mts at Nambucca Heads
- Boardwalk and beach access construction - 50 mts at Valla Beach
- The Nambucca Valley Conservation Association Inc completed a \$32 000 federally funded project called 'Sustainable Growing Systems for Nambucca Shire'. This project explored the sustainability of organic agriculture as opposed to the environmental unsustainability of genetic engineering (GE) in agricultural practices and resulted in the publication of two documents, one an academic report, and the other, a booklet called 'Our GE Future'. More information can be found on www.nvca.green.net.au
- Council has a representative on the North Coast Vertebrate Working Group which coordinates actions between State agencies, Local Government Authorities, other agencies and land owners when dealing with feral animal issues (e.g. wild deer, foxes, rabbits and cane toads). The group meets three times a year

Biodiversity Conservation Land



DISCLAIMER
 Maps Updated and Published by Nambucca Shire Council.
 Copyright Nambucca Shire Council 2009.
 Base data supplied by NSW Department of Lands.
 Map or plan accuracy is not guaranteed to be exact to scale
 or survey standard. Nambucca Shire Council accepts no
 responsibility for any errors or inaccuracies.

- Local
- Regional
- Regional (cleared corridor)
- State (DECC & Forest NSW Estate)
- State
- State (cleared corridor)
- Water
- Undescribed



1:99,293
 Scale @ A4
 Date: 10/03/2009

Figure 5.1 Location of Biodiversity Conservation Land

Table 5.3 Noxious weed declarations for Nambucca Shire Council

Weed	Class
African feathergrass [Pennisetum macrourum]	5
African turnipweed [Sisymbrium runcinatum]	5
African turnipweed [Sisymbrium thellungii]	5
Alligator weed [Alternanthera philoxeroides]	2
Anchored water hyacinth [Eichhornia azurea]	1
Annual ragweed [Ambrosia artemisiifolia]	5
Arrowhead [Sagittaria montevidensis]	5
Artichoke thistle [Cynara cardunculus]	5
Athel pine [Tamarix aphylla]	5
Bathurst/Noogoora/Californian/cockle burrs [Xanthium species]	4
Bear-skin fescue [Festuca gautieri]	5
Bitou bush [Chrysanthemoides monilifera subspecies rotundata]	4
Black knapweed [Centaurea nigra]	1
Blackberry [Rubus fruticosus aggregate species] except cultivars Black satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smoothstem, Thornfree	4
Boneseed [Chrysanthemoides monilifera subspecies monilifera]	4
Bridal creeper [Asparagus asparagoides]	5
Broad-leaf pepper tree [Schinus terebinthifolius]	3
Broomrapes [Orobanche species] Includes all Orobanche species except the native O. cernua variety australiana and O. minor	1
Burr ragweed [Ambrosia confertiflora]	5
Cabomba [Cabomba caroliniana]	5
Camphor laurel [Cinnamomum camphora]	4
Cayenne snakeweed [Stachytarpheta cayennensis]	5
Chilean needle grass [Nassella neesiana]	4
Chinese celtis [Celtis sinensis]	3
Chinese tallow tree [Triadica sebifera]	3
Chinese violet [Asystasia gangetica subspecies micrantha]	1
Clockweed [Gaura parviflora]	5
Cockle burrs [Xanthium species]	
Columbus grass [Sorghum x almum]	4
Corn sowthistle [Sonchus arvensis]	5
Crofton weed [Ageratina adenophora]	4
Dodder [Cuscuta species] Includes All Cuscuta species except the native species C. australis, C. tasmanica and C. victoriana	5
East Indian hygrophila [Hygrophila polysperma]	1
Espartillo [Achnatherum brachychaetum]	5
Eurasian water milfoil [Myriophyllum spicatum]	1
Fine-bristled burr grass [Cenchrus brownii]	5
Fireweed [Senecio madagascariensis]	4
Fountain grass [Pennisetum setaceum]	5
Gallon's curse [Cenchrus biflorus]	5
Giant Parramatta grass [Sporobolus fertilis]	4
Giant rat's tail grass [Sporobolus pyramidalis]	3
Glaucous starthistle [Carthamus glaucus]	5
Golden thistle [Scolymus hispanicus]	5
Green cestrum [Cestrum parqui]	3
Groundsel bush [Baccharis halimifolia]	3
Hackleberry, Celtis [Celtis sinensis] see Chinese Celtis	
Harrisia cactus [Harrisia species]	4
Hawkweed [Hieracium species]	1
Honey locust [Gleditsia triacanthos]	3
Horsetail [Equisetum species]	1

Source: DECCW

Weed	Class
Hygrophila [Hygrophila costata]	2
Hymenachne [Hymenachne amplexicaulis]	1
Johnson grass [Sorghum halepense]	4
Karoo thorn [Acacia karroo]	1
Kochia [Bassia scoparia]	
except Bassia scoparia subspecies trichophylla	1
Kudzu [Pueraria lobata]	3
Lagarosiphon [Lagarosiphon major]	1
Lantana [Lantana species]	4
Lantana [Lantana species]	5
Leafy elodea [Egeria densa]	5
Long-leaf willow primrose [Ludwigia longifolia]	5
Mexican feather grass [Nassella tenuissima]	1
Mexican poppy [Argemone mexicana]	5
Miconia [Miconia species]	1
Mimosa [Mimosa pigra]	1
Mistflower [Ageratina riparia]	4
Mossman River grass [Cenchrus echinatus]	5
Mysore thorn [Caesalpinia decapetala]	3
Onion grass [Romulea species]	
Includes all Romulea species and varieties except R. rosea var. australis	5
Oxalis [Oxalis species and varieties] Includes all Oxalis species and varieties except the native species O. chnoodes, O. exilis, O. perennans, O. radicata, O. rubens, and O. thompsoniae	5
Pampas grass [Cortaderia species]	4
Parthenium weed [Parthenium hysterophorus]	1
Pond apple [Annona glabra]	1
Prickly acacia [Acacia nilotica]	1
Prickly pear [Cylindropuntia species]	4
Prickly pear [Opuntia species except O. ficus-indica]	4
Privet (Broad-leaf) [Ligustrum lucidum]	4
Privet (Narrow-leaf/Chinese) [Ligustrum sinense]	4
Red rice [Oryza rufipogon]	5
Rhus tree [Toxicodendron succedaneum]	4
Rubbervine [Cryptostegia grandiflora]	1
Sagittaria [Sagittaria platyphylla]	5
Salvinia [Salvinia molesta]	3
Sand oat [Avena strigosa]	5
Senegal tea plant [Gymnocoronis spilanthoides]	1
Serrated tussock [Nassella trichotoma]	4
Siam weed [Chromolaena odorata]	1
Smooth-stemmed turnip [Brassica barrelieri subspecies oxorrhina]	5
Soldier thistle [Picnoman acarna]	5
Spiny burrgrass [Cenchrus incertus]	4
Spiny burrgrass [Cenchrus longispinus]	4
Spotted knapweed [Centaurea maculosa]	1
Texas blueweed [Helianthus ciliaris]	5
Water caltrop [Trapa species]	1
Water hyacinth [Eichhornia crassipes]	3
Water lettuce [Pistia stratiotes]	1
Water soldier [Stratiotes aloides]	1
Willows [Salix species] Includes all Salix species except S. babylonica, S. x reichardtii, S. x calodendron	5
Witchweed [Striga species] Includes all Striga species except native species and Striga parviflora	1
Yellow bells [Tecoma stans]	3
Yellow burrhead [Limnocharis flava]	1
Yellow nutgrass [Cyperus esculentus]	5

Table 5.4 Endangered and Threatened Species in Nambucca Shire

Endangered and Threatened Species	
Fauna	Status
Australasian Bittern	V
Australian Fur-seal	V
Barking Owl	V
Barred Cuckoo-shrike	V
Beach Stone-curlew	E1
Black Bittern	V
Black-necked Stork	E1
Black-tailed Godwit	V
Booroolong Frog	E1
Broad-billed Sandpiper	V
Brolga	V
Brown Treecreeper (eastern subspecies)	V
Brush-tailed Phascogale	V
Brush-tailed Rock-wallaby	E1
Bush Stone-curlew	E1
Comb-crested Jacana	V
Common Blossom-bat	V
Common Planigale	V
Eastern Bentwing-bat	V
Eastern False Pipistrelle	V
Eastern Freetail-bat	V
Eastern Long-eared Bat	V
Flesh-footed Shearwater	V
Giant Barred Frog	E1
Glandular Frog	V
Glossy Black-Cockatoo	V
Golden-tipped Bat	V
Greater Broad-nosed Bat	V
Green and Golden Bell Frog	E1
Green Turtle	V
Green-thighed Frog	V
Grey-headed Flying-fox	V
Humpback Whale	V
Koala	V
Large-footed Myotis	V
Little Bentwing-bat	V
Little Tern	E1
Loggerhead Turtle	E1
Long-nosed Potoroo	V
Mangrove Honeyeater	V
Marbled Frogmouth	V
Masked Booby	V
Masked Owl	V
New Zealand Fur-seal	V
Olive Whistler	V
Osprey	V

Source: DECCW

Pale-headed Snake	V
Parma Wallaby	V
Pied Oystercatcher	V
Powerful Owl	V
Providence Petrel	V
Red-legged Pademelon	V
Red-tailed Black-Cockatoo	V
Regent Honeyeater	E1
Rose-crowned Fruit-Dove	V
Rufous Bettong	V
Rufous Scrub-bird	V
Sanderling	V
Sooty Owl	V
Sooty Oystercatcher	V
Sooty Tern	V
Southern Giant Petrel	E1
Speckled Warbler	V
Sphagnum Frog	V
Spotted-tailed Quoll	V
Square-tailed Kite	V
Squirrel Glider	V
Stephens' Banded Snake	V
Stuttering Frog	E1
Superb Fruit-Dove	V
Terek Sandpiper	V
Wandering Albatross	E1
Wompoo Fruit-Dove	V
Yellow-bellied Glider	V
Flora	
Acacia chrysostricha	E1
Acronychia littoralis	E1
Amorphospermum whitei	V
Bulbophyllum globuliforme	V
Chamaesyce psammogeton	E1
Diuris venosa	V
Gaultheria viridicarpa subsp. viridicarpa	V
Glycine clandestina	E1
Gingidia montana	E1
Hicksbeachia pinnatifolia	V
Macadamia tetraphylla	V
Marsdenia longiloba	E1
Melaleuca groveana	V
Neostelia spectabilis	V
Parsonsia dorrigoensis	V
Pomaderris queenslandica	E1
Senna acclinis	E1
Syzygium paniculatum	V
Tasmannia glaucifolia	V
Tinospora smilacina	E1
Tinospora tinosporoides	V
Tylophora woollsii	E1

V = Vulnerable, E1 = Endangered

Table 5.5 Protected lands and area in Nambucca Shire

Name	Type	Area (Ha)
Nambucca Aboriginal Area	Aboriginal Area	2.11
Nunguu Mirral Aboriginal Area	Aboriginal Area	123.05
	Aboriginal Area Total	125.16
Dunggir National Park	National Park	2580.88
Gumbaynggir National Park	National Park	4523.64
New England National Park	National Park	4671.02
Yarriabini National Park	National Park	1467.77
	National Park Total	13243.31
Bollanolla Nature Reserve	Nature Reserve	651.27
Bowraville Nature Reserve	Nature Reserve	84.04
Ganay Nature Reserve	Nature Reserve	140.67
Jagun Nature Reserve	Nature Reserve	98.78
Jugawaarri Nature Reserve	Nature Reserve	2198.17
Ngambaa Nature Reserve	Nature Reserve	9908.15
Valla Nature Reserve	Nature Reserve	48.11
	Nature Reserve Total	13129.19
Gumbaynggir State Conservation Area	State Conservation Area	2534.36
	State Conservation Total	2534.36

Reserve information has been generated from the National Parks and Wildlife Service Estate GIS layers and includes the NPWS Estate as at 30 June 2009. Where a reserve is entirely within the LGA the total area is the gazetted area. Where only part of the reserve falls within an LGA the total area is the GIS calculated area and is an approximate only.

Table 5.6 Endangered Ecological Communities in Nambucca Shire

Threatened Ecological Communities
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions

Source: DECCW

6.0 Atmosphere

6.1 INTRODUCTION

Air pollution typically results from a range of human activities. The primary source of air pollution in Nambucca Shire is burning vegetation followed by motor vehicles and woodfire heaters. Other sources are industrial processes, construction and demolition, incineration, solid waste disposal and domestic heating.

The effect of air pollution can be far reaching and may impact on climate, human health, visibility, property, flora, fauna and water quality.

Nambucca Shire's air quality is perceived to be quite good, although during the winter season (low fire risk) the air quality is lower with rural burning and extensive bushfire hazard reduction in rural areas.

It is the urban and rural residential areas that are increasingly subject to air pollution associated with illegal

backyard burning, bushfire hazard reduction and internal combustion heaters.

Other areas of concern are from the dust disturbance from unsealed roads in the shire, particularly after a long dry spell.

Air pollution issues may increase in the shire in direct correlation with population increase and the already heavy dependence on the motor vehicle for transport.

6.2 PRESSURES ON OUR ATMOSPHERE

- Urban air pollution
- Wood fire heaters
- Backyard burning
- Rural burning
- Motor vehicle emissions and road dust
- Commercial business operators (saw mills, quarries, food shops)
- Construction and demolition
- Greenhouse Gasses

Tables 6.1 and 6.2 Atmosphere Indicators

Source of Air Pollution **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Smoke	14	17	8	13	8	↑
Odour	5	10	8	9	2	↑
Dust	5	3	3	2	0	↑
Total Complaints	24	30	19	24	10	↑
Complaints to DECCW ***	27	20	6	13	12	↓

** Statistics from Councils Customer Service Requests *** Statistics from Department of Environment, Climate Change and Water (DECCW) www.environment.nsw.gov.au

Greenhouse Indicators **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Council electricity usage (GJ)	no data	no data	8550	9012	23 442	↓
Total greenhouse (CO ₂) emissions produced by Council operations (tonnes)	no data	no data	3 989	4 168	4 058	↓
Number of Vehicles in Council's Fleet	no data	no data	68	68	69	↓
Number of Vehicles that are powered with gas/hybrid	no data	no data	4	4	4	↔
Total greenhouse (CO ₂) emissions produced by Council fleet (tonnes)	no data	no data	900	793	867	↑
Number of vehicles registered in Nambucca Shire Council Area ***	no data	15 788	16 142	18 401	17 475	↑
Total km of cycleways in LGA	no data	no data	no data	3	3.4	↑

** Statistics from Councils Engineering Department *** Statistics from NSW Roads and Traffic Authority (RTA) www.rta.nsw.gov.au



Clouds
Photo Google



Bushfire
Photo Google



Car Exhaust
Photo Google



Fast Food Odour
Photo Google

6.2.1 Urban air pollution

From a local perspective, various activities contribute to the deterioration of air quality in the Nambucca shire.

Poor air quality is generally associated with urban and industrial areas., where vehicle use, heating and production is higher. Air quality also varies locally, depending on adjoining land uses, and even varies between the home and workplace.

6.2.2 Wood fire heaters

Solid fuel stoves and heaters are still relatively common in both new and old residential areas. The main causes of complaints in relation to these devices are incorrect usage, inappropriate fuels, weather conditions (majority of complaints received during colder months) and poorly placed or maintained flues.

The emissions from solid fuel stoves and heaters contain substantial quantities of fine particles that have been identified by health authorities as contributing to respiratory disorders, illness and death. Due to these potentially grave circumstances, it is deemed necessary by Council that those wishing to install a solid fuel heater must obtain Council's approval under Section 68 of the *Local Government Act 1993* relating to solid fuel heaters.

6.2.3 Backyard burning

Backyard burning was previously a common practice in the Shire and a common basis of complaints. It can cause smoke haze (resulting in respiratory problems), offensive odours and the fallout of ash and other substances.

Under the *Protection of the Environment Operations (Clean Air) Regulation 2002*, Council has been listed under Schedule 1 Part 2 which restricts backyard burning in mapped areas of the shire.

6.2.4 Rural burning

There are no regulations for rural burning as most agricultural activities and non domestic waste service areas are exempt under the *Protection of the Environment Operations (Clean Air) Regulation 2002*.

Complaints from rural burning in close proximity to rural residential areas still remains the highest contributor to air pollution complaints.

6.2.5 Motor vehicle emissions and road dust

Vehicle emissions in urban areas is

becoming an issue as the population increases and people rely on their own vehicles as transport.

Dust is a common problem for residents living adjacent to unsealed rural roads. Dust from unsealed roads can cause problems, particularly during prolonged dry periods. The shire has 52% unsealed roads.

6.2.6 Commercial business (saw mills, quarries, food shops)

Smoke from the Shires saw mills becomes a problem in the winter months. All sawmills in the shire are controlled by DECCW.

The *Protection of the Environment Operations Act 1997* requires certain premises in the Nambucca Shire to be licensed for the discharge of substances into the environment. The Department of Environment, Climate Change and Water issues these licenses and any breaches of conditions must be reported to the Department of Environment, Climate Change and Water.

Dust from extractive industries can become a health issue due to the high silica content of the minerals extracted. These minerals when crushed can make a considerable amount of dust that if not dealt with at the source can be taken away by wind and deposited on roofs on nearby homes. This dust can make its way into the homesteads water supply.

Offensive odours can adversely impact on the amenity of an area and can cause irritation and discomfort to Shire residents. Odour is one of the most common sources of air quality complaints in the Shire. The main sources of complaints have historically been backyard burning, home activities, animals, sewage treatment works and on-site effluent systems. Recent sources are food shops and food manufacturing, these premises also have a issue of oily exhaust drift into nearby residences.

6.2.7 Construction and demolition

Construction and demolition sites in urban areas contribute to a high number of complaints. It appears the controls used in dust suppression are not being used properly or omitted in a cost saving exercise.

Large subdivision sites are a continuous source of complaints. From dust and smoke from burning felled vegetation to old equipment being used onsite. There is an increasing trend to clear fell a site, burn the vegetation and leave it until the house building companies are engaged.

6.2.8 Greenhouse Gasses and Climate Change

The majority of available evidence suggests that the release of greenhouse gases into the atmosphere as a result of human activities is having a discernable influence on the global climate. Solar radiation received at the earth's surface provides the energy that supports life. Around 30% of the solar radiation that reaches the earth is reflected back into space by clouds, dust and reflective surfaces (e.g. snow or water bodies). The remaining 70% is absorbed at the surface and then re-radiated as longer wavelength infrared energy. While the presence of greenhouse gases including water vapour, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), chlorofluorocarbons (CFCs) and sulfur hexafluoride (SF₆) allow the incoming short-wave radiation to reach the surface, they also act to absorb some of the outgoing radiation (Environment Protection Authority, 2000).

Over the last two centuries the concentration of these greenhouse gases has increased due to human activities. This has altered the earth's radiation balance, so that more long-wave radiation is being absorbed in the lower atmosphere resulting in increased temperatures. This 'enhanced' greenhouse effect is expected to lead to an increase in the earth's temperature and thus changes in rainfall, soil moisture and sea level. Evidence suggests that the effect on climate is already detectable and it is predicted that significant climate changes will become increasingly evident over the next few decades (Environment Protection Authority, 2000).

6.3 RESPONSES TO THESE PRESSURES

6.3.1 Urban air pollution

Council has limited control in relation to air quality in the Shire. When a problem is reported, Council officers inspect the site and make recommendations on a case by case basis. Where complaints are received, every effort is made to encourage compliance with the relevant legislation.

Tighter controls on woodfire heaters, backyard burning and rural burning by legislation has and will help the quality of air in urban areas.

6.3.2 Wood fire heaters

DECC notes that smoke from wood heaters contributes to air pollution

which makes it worse for people with asthma. You can minimise pollution by:

- always burning small logs of aged, dry hardwood – unseasoned wood has more moisture which makes a heater smoke
- storing wood under cover in a dry ventilated area; freshly cut wood needs to be stored for 8–12 months
- never burning rubbish, driftwood or treated or painted wood, which pollute the air and can be poisonous
- using plenty of dry kindling to establish a good fire quickly, when lighting a cold heater
- stacking wood loosely in your firebox so air can circulate—don't cram the firebox full
- keeping the flame lively and bright; your fire should only smoke for a few minutes when you first light it and when you add extra fuel.
- Open the air controls fully for 5 minutes before and 15–20 minutes after reloading
- not letting your heater smoulder overnight— keep enough air in the fire to maintain a flame
- checking your chimney regularly— if there is smoke coming from the chimney, increase the air supply to your fire
- cleaning the chimney every year, to prevent creosote build-up.

When assessing applications to install solid fuel heating appliances, Council considers safety concerns for dwellings and assesses potential impacts on air quality in the area (however they are difficult to predict).

Council does not currently have policies in place that regulate the number of dwellings using solid fuel heating appliances in a particular locality. This approach may lead to future problems if the number of dwellings utilising these devices in a certain area increases.

Other Local Government Areas in northern NSW have experienced deteriorating air quality from these devices and have adopted policies restricting the use of solid fuel heating appliances.

6.3.3 Backyard burning

The Department of Environment and Climate Change (DECC) revised and repealed the *Protection of the*



Fire Education
Photo Google



Clouds
Photo Google



Backyard Burning
Photo Google



Timber Mill
Photo Google



Clear Sky
Photo Google



Combustion Heater
Photo Google



Intensive Agriculture odour
Photo Google



Exhaust
Photo Google

Environment Operations (Control Of Burning) Regulation 2000 and incorporated its provisions as Part 2A of the *Protection of the Environment (Clean Air) Regulation 2002*.

In 2006 Council adopted Schedule 8 Part 2 of the Regulation that deals with burning of vegetation.

In January 2009 The NSW Department of Environment and Climate Change (DECC) notified Council that they are revising the Protection of the Environmental Operations (Clean Air) Regulation 2002, as required under the Subordinate Legislation Act 1989.

An important component of the regulation is Schedule 8 which enables councils to exercise a level of control on burning in the open and in incinerators that is appropriate to local conditions. Councils are listed under three Parts of Schedule 8 according to the preferences advised by Councils during the last remake of the Regulation in 2006

An increase in Customer complaints with respect to burning off domestic waste in rural-residential areas has prompted an additional listing in Part 3 in line with neighbouring rural Councils. Part 3 is 'Areas in which all burning (other than burning of vegetation) is prohibited except with approval or in relation to certain domestic waste'. This is aimed at preventing the burning of domestic waste (other than vegetation).

Council will now be listed in both Part 2 and 3 and will give Council greater control in dealing with backyard burning of domestic waste and vegetation in both urban and rural residential areas. This will be reflected in the revised regulation becomes gazetted in the next reporting year.

Council has applied the controls on burning vegetation only to the areas within towns and villages and known urban zonings. Control of burning maps are now posted on Council's website. Yellow areas are areas that individuals must apply to council if they want to burn, any other area is controlled by the Rural Fire Service.

Hazard reduction in urban areas at the interface of Crown Land is done mechanically to reduce air particle pollution and in the long term the risk of fire.

6.3.4 Rural burning

Land holders are legally required to reduce bushfire hazards on their land under the *Rural Fires Act 1997*. Landholders can hand clear, mow,

slash or use fire to reduce the load.

Rural land that is in close proximity to rural residential must be mindful of their neighbours and take steps to minimise the effects of a fire. Alternative methods can be employed to hazard reduction in key areas.

Council continues to work closely with the Rural Fire Service to reduce air pollution from burning off in the Shire.

6.3.5 Motor vehicle emissions and road dust

The Nambucca Shire LGA residents have an average vehicle fleet age of 13 yrs, Bellingen 12.9 yrs and Kempsey 13.4 yrs with Sydney having on average an age of 6.8 yrs (RTA 2009). An older fleet contributes more vehicle emissions and greenhouse gasses.

Council adopted its Sustainable Fleet and Plant Policy in March 2008. The objectives of this policy are to:

- Encourage the procurement of smaller, cleaner and less polluting vehicles.
- Reduce fuel consumption and reduce greenhouse gas emissions,
- Save both vehicle and running costs,
- Utilise renewable energy sources such as bio-diesel where it is available and compatible with engine warranty.

A Fleet Improvement Plan for the reduction of Greenhouse emissions was drafted in December 2007, this plan aims to consider the options available to Nambucca Shire Council for the reduction of Greenhouse Emissions associated with the motor vehicle and major plant fleet.

This plan considered 8 options assessed against a base year of 2006/07. Guidelines for greenhouse emission reduction is set out by the NSW State Government.

Council implemented a Dust Mitigation Policy in an attempt to reduce the amount of dust complaints arising from dwellings in close proximity to unsealed roads. The policy requires new dwellings to be set back at least 300 m from an unsealed road and the sealing of 100 m of road in front of the dwelling, or another acceptable measure such as landscape buffers. Whilst the policy may not substantially reduce the amount of dust generated, it has been effective in reducing complaints and requests for sealing by Council.

Quarries have strict operating procedures to combat dust, not only is the dust an issue to homesteads in close proximity but also to the quarries workers. Dust suppression mechanisms must be in place and operational. Albeit, dust is a by-product of quarrying.

Food shops have in recent years been responsible for many odour complaints, residents close to some food shops find some types of smells offensive. Compliance with air venting and exhaust outlets can reduce the odour to a reasonable level.

Odour from farming operations can be reduced by best farming practice and disposing of effluent in a responsible way. Council adopted on April 2nd a Keeping of Animals Policy which defines distances from residential areas for different types of animals.

6.3.7 Construction and demolition

Council enforces requirements through the development assessment process and Councils Compliance Officer.

6.3.8 Greenhouse Gasses and Climate Change

It has been accepted by Government that Climate Change is real and the effects are being realised and legislation changing to adapt to the future. During 2009 Nambucca Shire Council adopted the DECC Draft Sea Level Rise Policy Statement and this is reflected in the 149 certificates under the *Environment and Planning Assessment Act 1979*.

Council has been making progress in reducing its carbon footprint by:

- On 4th October 2007 Council signed up to the ICLEI 'Cities for Climate Protection Program'. This program is committed to reducing greenhouse gas emissions and support earth friendly energy initiatives.

Council created milestones to reduce emissions and identifies ways to reach the set targets. These targets ideally match up to the Kyoto Protocol. This project has unfortunately come to an end on the 30th June 2009.

However, Council hopes to reach Mile Stone 1 in the next reporting year. Council will remain diligent and follow the program in its efforts to reduce its footprint.

- Council is a member of the Sustainable Choice Program.

6.4 A SNAP SHOT OF 2008/09

- Students from Scotts Head Public School spread the message that carbon emissions can be reduced by people power. On Friday 29th August 2008 students built a Billy-cart and took turns in pushing and riding the cart up Waratah St to the Clean Energy Fair at Scotts Head Reserve.

The Clean Energy Fair guests displayed alternate energy systems such as solar power, wind energy, Country Energy's green power, hybrid cars, bicycles and using vegetable oil in diesel engines.

- In November 2008 Handybin waste services took delivery of its flagship plant, a eco-friendly ACCO 2350G rear loader, which was designed to meet the new federal government regulations regarding exhaust emissions. Australian Design Rules aim to significantly reduce air pollution, and apply it to all heavy transport vehicles built from 1 January 2008.

The vehicle is fitted with a Cummins ERG (Exhaust Gas Recirculation) Euro 4 diesel engine. Exhaust emissions are greatly reduced and are much cleaner through the EGR technology which pumps exhaust gasses back through the engine, where they are re-burned.

- Regional plans and development applications are now going to take Climate Change into account for future water level rises as the Department of Environment and Climate Change developed a draft sea level rise benchmark of 40 cm for 2050 and 90 cm for 2100. This was adopted by Council on the 16th April 2009.



Clearing Vegetation for a fire break
Photo Google



Smoke
Photo Google



Industrial burning
Photo NSC



Machinery pollution
Photo NSC



7.0 Waste & Resource Recovery

7.1 INTRODUCTION

As people buy and consume more products, the rate of waste generation increases. This general trend places pressures on the environment and Council's waste management systems.

People who reside, visit or work in Nambucca Shire, can reduce this impact by taking more responsibility for their waste. This involves actively avoiding waste generation, recycling more, and disposing of non-recyclable materials responsibly. This includes utilising councils green waste service as apposed to illegally burning off in urban and rural – residential areas which increases air pollution.

Council is constantly improving its capacity to handle waste effectively and to reduce the initial generation of waste by implementing various plans, policies, strategies and education programs.

Council regards a large percentage of waste as a valuable resource, and is constantly increasing efforts to divert waste from landfill by improving resource recovery throughout the LGA.

The landscape, streetscape, mix of housing types and the characteristics of residents, visitors and businesses are not uniform across the Shire, neither are the waste avoidance and resource needs and challenges.

Nambucca Shire Council has various responsibilities regarding the management of a range of waste products throughout the Shire. The form of these wastes is variable and includes the solid waste products generated in households and local industries and the liquid waste treated by the local wastewater treatment plants and on-site effluent disposal systems. In conjunction with other State Departments, Council is also responsible for monitoring and collecting data from a number of sites

classified as potentially contaminated or contaminated.

7.2 PRESSURES ON OUR WASTE SYSTEMS

- Population increase
- Littering
- Illegal dumping
- Decrease in availability of landfill
- Disposal costs
- Managing negative environmental impacts from landfill sites (leachate, greenhouse gasses)

Table 7.1 & 7.2 Waste Indicators

Environmental Indicator **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Municipal waste disposed to landfill (tonnes)	14663.41	13598.14	12459.3	9578.55	8954.86	↑
Recyclables diverted from landfill (tonnes)	no data	no data	no data	123.3	232.5	↑
Greenwaste diverted from landfill (tonnes)	759.97	613.98	335.35	671.85	662.23	↔
Scrap metal diverted from landfill (tonnes)	320.65	437.78	276.78	194.64	252.69	↑
Batteries diverted from landfill (tonnes)	8.67	8.17	6.81	8.12	4.99	↑
Motor oil diverted from landfill (litres)	2400	2500	1600	7500	5300	↑
E-waste diverted from landfill (tonnes)	no data	no data	no data	1.166	no data [^]	ND
Hazardous Materials diverted (tonnes)	no data	no data	no data	no data	6.213	ND
Dumped Rubbish Complaints	no data	no data	no data	no data	10	ND

** Statistics from Councils Engineering Department

[^] E-waste now grouped in Hazardous Materials

Nambucca Shire LGA Generated Kerbside Waste* **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Recycling (tonnes)	no data	no data	no data	1984.5	2006.82	↔
Organics (tonnes)	no data	no data	no data	2668.86	2754.44	↑
General Waste (tonnes)	no data	no data	no data	2127.08	2472.74	↓

* waste is processed at the Coffs Harbour transfer station

** Statistics from Coffs Coast Waste



Plastic chemical containers diverted from landfill
Photo NSC



Gas Cylinders diverted from landfill
Photo NSC



Scrap metal diverted from landfill
Photo NSC



E-waste diverted from landfill
Photo NSC

7.2.1 Population increase

The Shires population is increasing at a rate of 0.7% pa. That equates to a 0.7% increase in the amount of garbage going to fill per year.

The Shire is a popular holiday destination and during peak periods the amount of garbage in some key areas can double.

It can be shown that the Shires current recycling and garbage collection is not complementary for tourists. Both general waste and recycling bins are left out on the street for long periods of time during peak periods.

Holiday makers rarely recycle, tending to throw everything into the general waste bins through pure convenience.

7.2.2 Littering

It is very noticeable during the holiday periods that there is an increase in the amount of litter in and around the main commercial areas.

7.2.3 Illegal dumping

The dumping of litter is an unfortunate occurrence in the Shire and those offenders targeting public areas.

The main items dumped are white goods or contents of houses when the occupiers relocate.

There has been a decrease in the number of dumped and abandoned cars in the Shire since the last reporting period due to the higher price of steel, potential dumpers are getting some value back on their vehicles.

7.2.4 Decrease in availability of landfill

The new landfill facility was officially opened in December 2001. The previous landfill remains in use as a transfer station only and the current landfill provides the community with a "high tech" landfill.

The waste is stored in lined cells. Within each landfill stage, cells between 4000 and 8000 m² will be constructed in the direction of the land filling (east for Stage One, north for Stage Two and west for Stage Three). Each cell will be filled and capped in accordance with license conditions and design levels. Each stage will therefore comprise of around four cells. Each cell will be active for three to four years depending on population growth and the quantity of waste being generated. See table 7.3.

Table 7.3 Nambucca Shire Council Landfill Details

	Area (ha)	Landfill Volume (m ³)	Life of Stage (years)
Stage One	3.8	440,000	25
Stage Two	2.5	360,000	15
Stage Three	2.6	420,000	20
Total	8.9	1,220,000	60

7.2.5 Disposal costs

Disposal costs are inline with Councils' Fees and Charges policy. Changes to disposal costs and processing started from 1 July 2009 and will be reflected in next years SoE.

7.2.6 Managing negative environmental impacts from landfill sites (leachate, greenhouse gasses)

The old landfill site has been capped and controls in place to contend with potential pollutants such as leachate and gas. Surface water and ground water quality control systems are in place including the artificial wetland and the separation of stormwater from the waste disposal area.

7.3 RESPONSES TO THESE PRESSURES

7.2.1 Population increase

A \$75 million domestic waste kerbside collection contract was granted to Handybin Waste Services (Coffs Coast Waste Services) to provide a regional waste collection and recycling services for Coffs Harbour, Bellingen and Nambucca residents and has been effective from 28 November 2005 for a ten year period.

Handybin Waste Services provide a three-bin kerbside waste collection service for organics, recyclables and mixed waste for homes across the region covered by the three councils.

The Shires domestic waste service comprises of a weekly collection of greenwaste / foodwaste (240L MGB) and also provides 5 L kitchen tidy bins for the separation of food wastes. A fortnightly collection of mixed waste (240L MGB) and an alternate fortnightly collection of recycling materials (240L co-mingled MGB). The contract also provides for two kerbside bulky goods collections per year to the quantity of three cubic metres.

Handybin constructed a new \$4.5m Materials Recovery Facility (MRF) to process all recyclable materials which will operate alongside the Coffs Coast Regional Resource Recovery Facility at Englands Road, Coffs Harbour. Handybin is also responsible for the processing and marketing of recyclables, which will be collected from transfer stations in Bellingen and Nambucca, as well as the disposal of residue materials. Handybin also operates a call centre to deal with customer enquiries and provides a educational facility at the site.

A separate \$125 million contract to process organic wastes and mixed waste materials for Coffs Harbour, Bellingen and Nambucca residents was awarded to Biomass Solutions Coffs Harbour.

Biomass Solutions commissioned the organics processing in early March 2007. The processing of mixed domestic waste commenced September 2007 using state-of-the-art technology that process organic and mixed wastes into resources such as fuels and compost.

All mixed waste and recyclable materials generated in the region will be transported to Coffs Harbour's Waste Facility for processing into renewable resources. It is anticipated that the source separation and the recovery of reusable products will result in a diversion of waste from landfill of approximately 80 - 85% across the three LGAs. Further gains are to be had by the separation and recycling of concrete/ masonry products, greenwaste/raw timber and scrap metal products at the landfill sites.

7.3.2 Littering

The collection of street and parkland litter waste is collected and controlled by Councils day labour force

7.3.3 Illegal dumping

Council employed a part time ranger to do various tasks including investigation into illegal dumping. During the reporting year 5 clean-up notices were issued and 4 penalty notices served to offenders for illegally dumping garbage in public areas.

7.3.4 Decrease in availability of landfill

The area of the new landfill site will be in operation for the next 60 years. The waste currently collected from the shire is disposed of outside our shire, freeing up valuable landfill cell areas for 10 years or more depending on continuation of the current contract with handybin Waste Services.

Over 80% of household waste from the Shire was diverted from landfill in the form of recyclables (plastics, paper and steel), metals, greenwaste and assorted e-waste, batteries, oils and chemicals

7.3.5 Disposal costs

Council has invested approximately \$1.2 million on the current site (more in the future as the old landfill is rehabilitated and subsequent cells on the new site are built)

A buy back centre has allowed for the sale and diversion of reusable articles. On average over 2000 items pa. are sold.

The NSW Sates mini-budget announced 11 November 2008 included the extension of the waste and environment levy on waste disposal of waste to landfills. This levy applies to all coastal councils.

The purpose of continuing the levy is to provide incentives and support to reduce waste and increase recycling. The levy in Sydney metropolitan areas has driven innovative greener waste technology with 6 advanced waste treatment facilities and seven more in the pipeline.

Waste materials disposed of to the Nambucca landfill will attract a \$10.00 levy per tonne from July 1st 2009. The levy increases by \$10.00 pa until it reaches around \$70.00 per tonne by 2015/16 at which point it will be inline with Sydney Metro areas.

7.3.6 Managing negative environmental impacts from landfill sites (leachate, greenhouse gasses)

Councils new landfill site has one artificial wetland to capture and filter surface water run off from the site and one leachate pond that captures the leachate from the landfill.

The ponds leachate level is controlled by irrigating on capped/rehabilitated landfill cells to stop any overflow.

As required by NSW Department of Environment, Climate Change and Water Environment Protection Licences, Council currently monitors groundwater at bores adjacent to the previous and current landfill sites on Old Coast Road, Nambucca Heads. Council has been monitoring ground and surface water in and around both landfill facilities since 2000 as a requirement of the licences

October 2007 saw the implementation of Council's Liquid Waste Policy. This policy strives to assist Council to



Dumped Rubbish
Photo NSC



Leachate Testing at Shire's landfill
Photo NSC



Dumped Rubbish
Photo NSC



Leachate holding tanks
Photo NSC



Leachate Management
Photo NSC



Dumped Rubbish
Photo NSC



Dumped Car
Photo NSC

achieve sound, efficient and responsible, management and pricing of liquid trade waste and to comply with the Dept. of Water and Energy's Best - Practice Management of Water Supply and Sewerage Guidelines.

This policy requires identified Liquid Trade Waste dischargers to gain formal approval from Council for discharge to the sewerage system. Such approval is subject to specified conditions and the provision of appropriate pre treatment infrastructure.

Inspections of properties have been undertaken to explain the process to the affected property owners or tenants and to ensure that all pre treatment infrastructure satisfies current standards.

7.4 A SNAP SHOT OF 2008/09

- Drum muster was run in May 09
- 250,000 L of effluent was collected from the sale yards in 2008/09. The effluent was re-used as fertiliser on agricultural land in the Shire.
- Clean-Up Australia Day was well patronised throughout the Shire, organisations, schools and community groups all pitched in and helped clean up the shire.

8.0 Noise

8.1 INTRODUCTION

Noise pollution can be defined as unwanted or offensive sounds that unreasonably intrude into our daily activities. It has many sources, most of which are associated with urban development such as roads, air, transport, industrial noise, neighbourhood and recreational noise. The impact of noise in our community can reduce public amenity, and adversely affect health and communication.

Noise pollution can cause a major reduction in the quality of life. However, some unavoidable activities, such as demolition, construction and excavation, are inherently noisy and need to be well managed rather than prevented.

The Department of Environment and Climate Change (DECC), the NSW Police Service, and Council all play a part in monitoring and regulating noise control.

The *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (noise Control) Regulation 2008* are the principal legislation applied throughout NSW to address environmental noise issues.

The regulation of noise falls on many different departments, such as DECC, NSW Police, Local Government, RTA, Commonwealth Government and RailCorp.

There are various Acts and Regulations, both Commonwealth and State to govern noise. For example Nuisance dogs

8.2 PRESSURE ON OUR ENVIRONMENT FROM NOISE

- Increased population
- Barking dogs and crowing roosters
- Traffic and transport
- House and car alarms
- Swimming pool pumps
- Mechanical ventilation systems (air conditioners)
- Parties
- Off Road Vehicles
- Construction noise
- Industrial estate noise
- Garbage collection
- Licensed venues

8.2.1 Increased population

As the Shires population increases on average by 0.7% the current urban areas become denser as more houses are squeezed in. Along with the houses are the noisy mod-cons (pools, air conditioners), vehicles and usually a barking dog.

8.2.2 Barking dogs and crowing roosters

Complaints about roosters crowing have been steadily rising since 2004. Nearly half of all noise complaints were attributed to crowing roosters.

The custom of keeping fowl for eggs and meat in previous years is now creating a nuisance in the built up urban areas.

Roosters create problems of noise in the early hours of the morning. Bowraville and Nambucca Heads have the highest reported problems with roosters in a built up area.

There are increasing complaints from rural-residential areas as more people opt for the hobby farm lifestyle but sometimes forget that their neighbours are closer than in a rural setting.

There is a significant reduction of noise attributed from dogs from last years reporting period. Dogs bark usually due to insufficient space, provocation, lack of exercise or inadequate shelter, sickness, or an unstable diet.

8.2.3 Traffic and transport

Complaints to Council about traffic noise are negligible. It would appear that residents accept the ambient noise levels created by traffic.

8.2.4 House and car alarms

There was only one complaint about a house alarm during 08/09. As the population increases the occurrence of loud alarms, both car and house will increase.

8.2.5 Swimming pool pumps

The trend for installing swimming pools is increasing in recent times. Pool pumps are not being put in a sound box and are being run during the restricted times as imposed by the *Protection of the Environment Operations (noise Control) Regulation 2008*

Table 8.1 Noise Indicators

Source of Noise **	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Commercial & construction	8	2	4	10	28	↓
Dogs	20	35	31	26	14	↑
Roosters	3	5	10	11	10	↑
Other	10	4	14	16	5	↑
Total Complaints	41	49	59	63	57	↑
Complaints to DECCW ***	3	6	7	0	1	↓

** Statistics from Councils Customer Service Requests *** Statistics from Department of Environment, Climate Change and Water (DECCW) www.environment.nsw.gov.au



Truck engine brakes
Image Google



Dance Party
Image Google



Jackhammer
image Google



Rooster
Image Google

8.2.6 Mechanical ventilation systems (air conditioners)

There has been an increasing trend in installing air conditioners in the shire. The running noise from these units can be an issue as owners run them continuously and increasingly into the night.

8.2.7 Parties

Organised dance parties are a common occurrence in some parts of the shire. These parties can go for 24 hrs or more and are on private land. Not only is noise an issue but additional vehicle movements at all hours. Some of these parties have been known to attract several hundred revellers. The base rhythm can be associated with offensive noise. These parties are hard to police.

8.2.8 Off road vehicles

There are an increasing number of trail bike noise complaints within the rural and rural/residential areas of the shire, from kids on their dirt bikes after school and Saturdays to organised club rides. In some instances well made bike tracks have been constructed and up to 20 people have been riding. A trail bike can go to 120 decibels.

8.2.9 Construction noise

Noise from construction sites can be a nuisance. Most people tolerate construction noise as it will eventually abate once construction is completed.

Owner-builder sites have the highest number of noise complaints, and this can be attributed to the owner working after normal work hours to complete the project. There are specific construction times written into Development Application Conditions of Consent, usually 7 am to 6 pm unless otherwise stated.

8.2.10 Industrial estate noise

In recent years the Macksville Industrial estate has been expanded to accommodate larger industry and provide a larger employment base.

In recent times, some of the industry contained in the industrial estate has created an issue of operational noise for the surrounding residential areas. The operational noise from some of the larger heavy industry contained in the estate has been shown to be obtrusive and offensive.

8.2.11 Garbage collection

Complaints concerning the collection of garbage has been low with complaints mainly from pickup in

commercial or industrial areas.

8.2.12 Licensed venues

Licensed venues can attribute to noise late at night, from loud music to patrons leaving the premise in a disorderly way. Known hot spots are Nambucca Heads and Taylors Arm.

8.3 RESPONSES TO THESE PRESSURES

8.3.1 Increased population

In the reporting year there were 57 noise complaints received by Council. Council responded by carrying out inspections and taking the appropriate regulatory action. Most complaints were resolved at this stage.

8.3.2 Barking dogs and crowing roosters

Council adopted on the 2nd April 2009 a Keeping of Animals Policy which states that 'the keeping of roosters in residential, urban or village areas is prohibited', it also states 'the keeping of roosters in rural residential areas is not recommended. Noise issues relating to roosters will result in the removal of offending bird'. This policy will reduce the number of rooster complaints in the future.

The majority of dog noise complaints were resolved through mediation and negotiation. However, in the case of ongoing problems, Notices of Intent to issue Nuisance Orders, and Dog Nuisance Orders were issued under the *Companion Animals Act 1998*.

8.3.4 House and car alarms

Under the *Protection of the Environment Operations (noise Control) Regulation 2008*, alarms are only permitted to sound for a set time. Council can issue penalty notices for continuously or intermittently sounding vehicle or building alarms.

8.3.5 Swimming pool pumps

As part of the *Protection of the Environment Operations (noise Control) Regulation 2008*, pool pumps can only operate from 7 am through to 8 pm on weekdays and from 8 am through to 8 pm on Sundays and public holidays. On-the-spot fines can be issued on anyone who continues to make noise up to 28 days after being verbally warned to stop by a Council officer or the police.

8.3.6 Mechanical ventilation systems (air conditioners)

As part of the *Protection of the Environment Operations (noise Control) Regulation 2008*, air

conditioners can only operate from 7 am through to 10 pm on weekdays and from 8 am through to 10 pm on Sundays and public holidays. On-the-spot fines can be issued on anyone who continues to make noise up to 28 days after being verbally warned to stop by a Council officer or the police.

Residents must be mindful where they place the air conditioning units as many of the complaints received were of new machines mounted on their neighbours homes adjacent to the complainants bedrooms.

8.3.7 Parties

As part of the *Protection of the Environment Operations (noise Control) Regulation 2008*, amplified sound, musical instruments and other sound equipment can only operate from 8 am through to midnight on Friday, Saturday or any day preceding a public holiday and from 8 am through to 10 pm on any other day. On-the-spot fines can be issued on anyone who continues to make noise up to 28 days after being verbally warned to stop by a Council officer or the police.

8.3.8 Off Road Vehicles

Off road motorcycles often have mufflers that are not as effective as those on road vehicles. Schedule 1 of the *Protection of the Environment Operations (noise Control) Regulation 2008*, specifies a noise limit of 100 decibels for motorbikes operating off-road and there is an additional requirement under clause 13 of the Regulation that makes it illegal for off-road vehicles produce offensive noise. Penalty Notices can be issued.

Operating a club bike track on private land with out Council consent is illegal, these types of tracks need approval to operate.

Most noise complaints about children riding their bikes were mediated and a best outcome for all parties was usually negotiated.

8.3.9 Construction noise

Under the *Environmental Planning and Assessment Act 1979*, there is provision for Council to issue orders for not complying with Development Assessment Conditions of Consent. for hours of construction.

Under the *Protection of the Environment Operations (noise Control) Regulation 2008* penalty

Notices can be issued for the use of power tools after 8 pm and before 7 am weekdays and from 8 am to 8 pm on Sundays and public holidays.

8.3.10 Industrial estate noise

After an excessive amount of noise complaints from residents surrounding the industrial estate were received Council engaged Heggies P/L to do an acoustic study of the Macksville Industrial Estate.

The findings showed that there are many issues of excessive noise coming from the estate. In the final report there were several recommendations put forward and Council will continue to assess the issues contained in the report during the 2009/10 reporting year.

8.3.11 Garbage collection

Garbage collection starts at 6 am in residential areas and 5 am in industrial/commercial areas. The waste companies have been asked by council in commercial areas that are surrounded by residential zones that they start at 6 am to reduce the intrusive noise experienced by residents.

8.3.12 Licensed venues

The Liquor Administration Board manages noise from Licensed premises such as pubs and clubs. When the Board licences the premise, it may place environmental noise conditions on the license.



Air Conditioner
Image Google



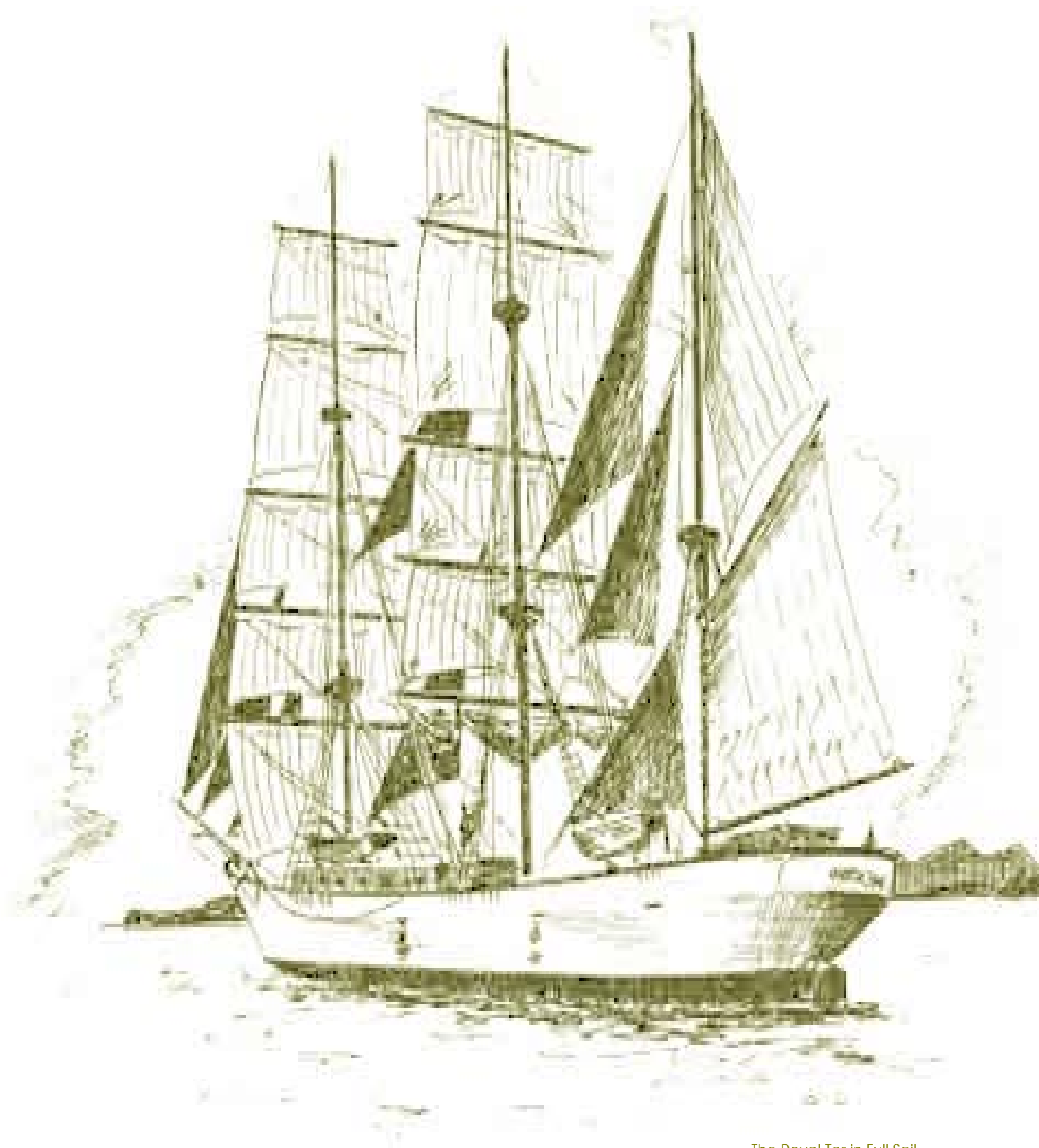
Dog Barking
Image Google



House Alarm
Image Google



Off Road Motorbikes
Image Google



The Royal Tar in Full Sail
Drawing by Alan Lucas

9.0 Aboriginal & Non-Aboriginal Heritage

9.1 INTRODUCTION

Heritage is defined as a place, object, custom or culture that has historic, scientific, cultural, social, archaeological, aesthetic, natural or Aboriginal significance. Heritage consists of those places and objects that we as a community have inherited from the past and wish to hand on to the future generations.

Our heritage gives us a sense of living history and provides a physical link to the work and way of life of earlier generations. It enriches our lives and helps us to understand who we are today.

Nambucca Shire's heritage is diverse and includes buildings, objects, monuments, Aboriginal places, gardens, bridges, landscapes, archaeological sites, shipwrecks, relics, bridges, streets, industrial structures and conservation precincts. Lists of heritage items are listed at the end of this chapter Tables 9.1, 9.2 and 9.3.

Aboriginal sites are the physical remains of a culture that is more than 40,000 yrs old. It is important that Aboriginal sites are recorded, studied and preserved as part of the cultural heritage of the Aboriginal people in the Nambucca Shire and as part of the wider communities historic and cultural heritage.

Aboriginal culture is about a deep belief of all living things and beyond, are connected. It's about a spirituality that stems from ancestors that practiced, listened, understood and preserved beliefs, language and customs. With these traditions there is a profound sense of respect for Elders and their knowledge.

Table 9.1 Heritage Indicators

Heritage Sites	2004/5	2005/6	2006/7	2007/8	2008/9	Movement towards sustainability
Aboriginal Heritage Sites **	154	154	169	173	249	↑
Non-aboriginal Heritage Sites ***	37	37	37	37	40	↑
Conservation Areas ***	2	2	2	3	3	↔

** Statistics from Department of Environment Climate Change and Water (DECCW) www.environment.nsw.gov.au

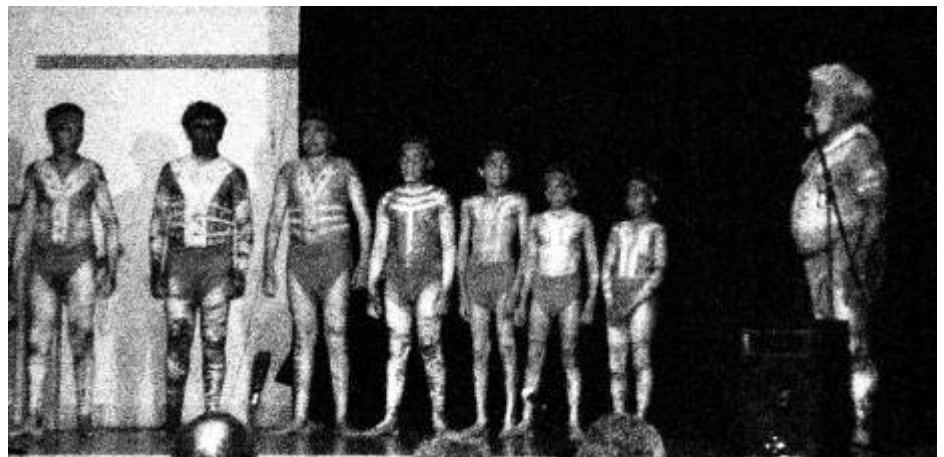
*** Statistics from NSW Heritage Department www.heritage.nsw.gov.au

Most Aboriginal sites have significance to Aboriginal people for the reasons that they were visited, ceremonial, tracked, births, deaths, burials and therefore stories connect us to that land. Depending on who used the site, men or women, has particular significance because of certain 'business' that had been performed there. These are the sites that are imperative to the life and death of all Aboriginal and non Aboriginal people and should be recorded and respected as such.

Aboriginal culture and heritage in the Nambucca Valley still exists and as yet not all sites have been located and recorded. Aboriginal culture is not as simple as this all sounds, there are parts of Aboriginal culture and heritage that are complex yet, has never been written, but has been handed down, orally, for over 40,000 years.

9.2 PRESSURE ON OUR ABORIGINAL AND NON-ABORIGINAL HERITAGE

- Lack of enforceable maintenance provisions for listed sites and Insufficient expertise in dealing with listed items
- Lack of understanding and recognition of Native Title rights and interests
- Erosion and damage of sites from wind, water, sun and human activities



Jumbaal dreaming Dancers
Photo NSC



Star Hotel, Macksville
Photo NSC



Nambucca, Macksville
Photo NSC



Post Office, Bowraville
Photo NSC



Main Street, Bowraville
Photo NSC

9.2.1 Lack of enforceable maintenance provisions for listed sites and insufficient expertise in dealing with listed items

It is important to note that the existing inventory of heritage listed sites within the Nambucca Shire could not be viewed as definitive and that many items of heritage significance may exist without the benefit of protection provided by planning instruments such as the Nambucca Local Environmental Plan 1995 and the North Coast Regional Environmental Plan 1988. It is considered that items such as these face the greatest degree of pressure from factors such as the lack of understanding and redevelopment.

There are a number of factors that are currently exerting significant pressure on the heritage value of many identified items and places within the Nambucca. These pressures include new development, redevelopment, wilful neglect due to high maintenance costs and deterioration by natural weathering processes. Other factors that also contribute to diminishing the heritage significance, including their character, are setting and integrity of many items, inappropriate alterations, additions and repairs.

9.2.2 Lack of understanding and recognition of Native Title rights and interests

Many Aboriginal sites in the Nambucca Shire are likely to have been damaged over time. A lack of understanding is one of the main issues impacting on Aboriginal Heritage within the Shire. This lack of understanding can lead to pressure on Aboriginal heritage through either indifference as to the significance of Aboriginal heritage items, or ignorance as to the actual or likely location of areas of significance. However, urban and rural development still presents the greatest threat to the conservation of relic and mythological sites within the Nambucca Shire.

9.2.3 Erosion and damage of sites from wind, water, sun and human activities

There are no reported destruction of any of the Shires heritage items, but graffiti, arson and vandalism is always a threat.

Unformed vehicle and livestock tracks, erosion scours, telecommunications easements, road cuttings and verges, and logging exposures can unearth and damage indigenous artefacts.

9.3 RESPONSES TO THESE PRESSURES

9.3.1 Lack of enforceable maintenance provisions for listed sites and insufficient expertise in dealing with listed items

Council maintains a register of known relics in the Shire. There are procedures in place to ensure that all proposals on land that have the potential to contain a relic or Aboriginal Conservation Area are referred to both DECCW (Culture and Heritage Division) and the relevant Local Aboriginal Land Council (LALC) for comment.

Statutory mechanisms for heritage conservation exist through the *Environmental Planning and Assessment Act*, *Heritage Act* and *National Parks and Wildlife Act*. Council has responsibility under these pieces of legislation during the development assessment and environmental impact assessment process to identify and manage heritage items which are of significance for the Nambucca Shire. Council addresses these responsibilities through the promotion of the following techniques:

- Statutory development controls
- Conservation incentives
- Public initiatives, and
- Specific local policies

An important function of the amendments to the Heritage Act has been the steady devolution of responsibility for heritage management from the Heritage Council to local government and the ability of Councils to use specific delegations where consistent with the guidelines of the Heritage Council. The benefits of these delegations include improved efficiencies in the approvals process resulting in time and cost savings and greater involvement and interest in the responsible management of heritage items by the local community in cooperation with Councils.

9.3.2 Lack of understanding and recognition of Native Title rights and interests

An Aboriginal Cultural Heritage Management Plan was adopted by Council on the 5 June 2008. This plan sets out to develop and present standards and guidelines which promote the identification and conservation of known and unrecorded Aboriginal sites, places and landscapes in the Shire.

The Plan is intended for use by those council staff who are required to address the assessment and management of Aboriginal cultural heritage in the LGA. The plan may also be used by the Local Aboriginal Land Councils (LALC) in the LGA (i.e. Nambucca, Unkya and Bowraville) in their roles in working with council and landowners to achieve positive conservation outcomes for sites in their area. Land owners and developers can use the plan to get an idea of issues and processes that relate to their proposed land uses and the conservation of Aboriginal heritage sites and places within the LGA.

The document provides a framework for the conservation and assessment of Aboriginal heritage sites and places within the LGA. It should be read in conjunction with any specific requirement or guidelines produced from time to time by the Department of Environment and Climate Change (DECCW) and/or in conjunction with the Director-General's (NSW Department of Planning) requirements in relation to any Environmental Impact Statement (EIS) under preparation.

9.3.3 Erosion and damage of sites from wind, water, sun and human activities

All Aboriginal sites have legal protection under both state and federal law and it is an offence to damage or destroy them without agreement from the Department of Environment and Climate Change

9.4 A SNAP SHOT OF 2008/09

During the year there were many historic and cultural events both aboriginal and European that involved the community.

- o NAIDOC 08 which ran from the 8th – 14th July 2008 was filled with many activities. A NAIDOC week march along Bowra Street in Nambucca Heads marked the start of NAIDOC week. The march was attended by local elders, community members and school children on July 4th.

At Macksville there was a traditional smoking ceremony

Nambucca High hosted many of the events for NAIDOC week these included:

- o Indigenous film screening
- o Gumbaynggirr Elders Choir
- o Balloon releasing ceremony
- o Bush tucker garden opening, displays of indigenous students art works
- o Community awards

Other events were a youth photography exhibition 'Through Our Eyes' at the Bowraville Art Gallery, 1500 images were taken and will be included in a limited edition book.

- o The Rusty Iron Rally once again revved up in September 2008 with the special feature display of Sunshine Engines and machinery and the Massey-Harris tractors who marked their 50 year of Massey Ferguson in Australia.
- o National Heritage Week was welcomed on 13th September with an open day at the Mary Boulton Cottage Museum at Macksville. There was a grand opening of the new shed, finished in August 08, that houses a collection of old ploughs, banana growing equipment, various machines and a WWII gyrocopter. The shed was built by volunteer labour from the Men's Shed in Nambucca Heads.
- o Also unveiled on 13th September was the Pioneer Wall at the Mary Boulton Cottage Museum. This wall will host various plaques that recognize the first settlers of the Nambucca Valley and those who followed in their footsteps.

The wall is open to anyone who wishes to pay tribute to their ancestors. The first plaque to be placed was Sister Watts, a pioneering Macksville midwife from the 1930's through to the 1960's who delivered many babies in harsh conditions as the town expanded.

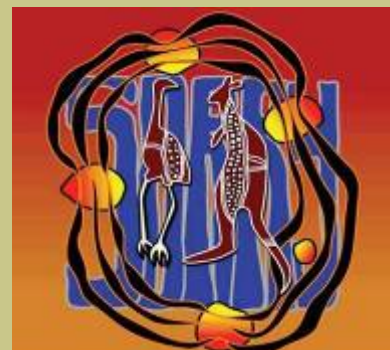
- o More than 250 former pupils of Warrell Creek Primary School gathered at Warrell Creek in March 2009 to mark 30 yrs since the closing of the primary school. The Warrell Creek hall will be celebrating its centenary in 2009.
- o In April 2009 the NSW Heritage website was launched. Working with Tourism NSW and the NSW Heritage Council, the department of Planning has created an easy to use website with 500+ state heritage registered places and items with tourism appeal for all ages.
www.heritage.nsw.gov.au



Gumbaynggirr Man
Photo Sydney Morning Herald



Wreck off Scotts Head
Photo M. Kavallaris Maritime Australia



NAIDOC Week 2008 Poster



Pioneer Wall unveiling
Photo Guardian News

Table 9.2 Heritage items listed for Nambucca Shire

Section 1. Items listed under the NSW Heritage Act.			
Item Name	Address	Suburb	Listed Under Heritage Act
Gondwana Rainforests of Australia		Various	Yes
Macksville Railway Station group	North Coast railway	Macksville	Yes
Section 2. Items listed by Local Government and State agencies.			
Bananacoast Credit Union	39 High Street	Bowraville	LGOV
Bowraville Central School	23 High Street	Bowraville	LGOV
Bowraville Fire Station	55 High Street	Bowraville	SGOV
Bowraville Services Club	57-59 High Street	Bowraville	LGOV
Bowraville Urban Conservation Area	Ford Street	Bowraville	GAZ
Commerical Building	46 High Street	Bowraville	LGOV
Dwelling	34 High Street	Bowraville	LGOV
Dwelling	36 High Street	Bowraville	LGOV
Dwelling	38 High Street	Bowraville	LGOV
Dwelling	40 High Street	Bowraville	LGOV
Dwelling	42 High Street	Bowraville	LGOV
Dwelling	52 High Street	Bowraville	LGOV
Dwelling	86C High Street	Bowraville	LGOV
Eliza and Joseph Newman Folk Museum	86D High Street	Bowraville	LGOV
Fire Station	55 High Street	Bowraville	LGOV
Former Council Chambers	29 High Street	Bowraville	LGOV
Garage/Workshop	56 High Street	Bowraville	LGOV
Grants Hall	82 High Street	Bowraville	LGOV
Macksville Station Group		Macksville	SGOV
Medical Rooms	49 High Street	Bowraville	LGOV
Museum and Former Presbyterian Church	86-88B High Street	Bowraville	LGOV
Nambucca Aboriginal Area	8km south-west of	Nambucca Heads	LGOV
Nambucca Hotel	2-4 Wallace Street	Macksville	LGOV
Nambucca North Headland		North of mouth of Nambucca River - 12 ha	LGOV
New England National Park		85km east of Armidale	GAZ
New England National Park	85km east of	Armidale	LGOV
Osprey nest sites and land within 100m of those sites		Bowraville	LGOV
Pioneer Community Centre	70 High Street	Bowraville	LGOV
Police Station and Court House	25 High Street	Bowraville	LGOV
Post Office	27 High Street	Bowraville	LGOV
Royal Hotel	84 High Street	Bowraville	LGOV

Scout Hall	48 High Street	Bowraville	LGOV
Shop	45 High Street	Bowraville	LGOV
Shop	45A High Street	Bowraville	LGOV
Shop	47 High Street	Bowraville	LGOV
Shop	64 High Street	Bowraville	LGOV
Shop	80 High Street	Bowraville	LGOV
Shop/dwelling	58A High Street	Bowraville	LGOV
St James Anglican Church	19 High Street	Bowraville	LGOV
Star Hotel, 3 signs, front & timber stables	River Street	Macksville	GAZ
State Bank	72 High Street	Bowraville	LGOV
Sullivan's Bowra Hotel	33 High Street	Bowraville	GAZ
Sullivan's Bowra Hotel	33 High Street	Bowraville	LGOV
The Bank	88 High Street	Bowraville	LGOV
The Remnant Basket	74 High Street	Bowraville	LGOV
The Star Hotel	15-17 River Street	Macksville	LGOV

Source: NSW Heritage Office

Table 9.3 Known Aboriginal Items in the Nambucca Shire

Site Feature	Number	Added since last SoE
Aboriginal Resource and Gathering	25	
Aboriginal Ceremony and Dreaming	24	
Art (Pigment or Engraved)	1	
Artefact	76	2
Burial	7	1
Ceremonial Ring (Stone or Earth)	12	1
Conflict	3	
Earth Mound	14	
Fish Trap	0	
Grinding Groove	0	
Habitation Structure	13	
Hearth	0	
Non-Human Bone and Organic Material	1	
Ochre Quarry	1	
Potential Archaeological Deposit (PAD)	19	
Shell	19	
Stone Arrangement	2	
Stone Quarry	0	
Modified Tree (Carved or Scarred)	30	2
Water Hole	2	
Total	249	6

Source: Department of Environment, Climate Change and Water (DECCW)

Table 9.4 Known ships that were wrecked in or adjacent to the Nambucca Shire

Title	Description	Region	Feature
Albany	The Albany was wrecked 2 miles North of Nambucca Heads after running aground on the 26/03/1905 while on a voyage from Sydney to Brisbane.	Mid North Coast	Shipwrecks
Alert	The Alert was wrecked at Nambucca Heads on the 21/02/1901.	Mid North Coast	Shipwrecks
Alert	The Alert was wrecked on the Nambucca River bar on the 28/07/1904.	Mid North Coast	Shipwrecks
Alpha	The Alpha was wrecked at Nambucca Heads on the 21/02/1897 while on a voyage from Sydney to Nambucca River.	Mid North Coast	Shipwrecks
Bellinger	The Bellinger was wrecked on the Nambucca River bar on 26/04/1912.	Mid North Coast	Shipwrecks
Bertha	The Bertha was wrecked at Nambucca Heads in a southerly gale on the 26/07/1891.	Mid North Coast	Shipwrecks
Bismark	The Bismark was wrecked on the Nambucca River bar after a towrope broke on the 09/06/1878 while on a voyage from Nambucca River to Sydney.	Mid North Coast	Shipwrecks
Britannia	The Britannia was wrecked at the entrance to the Nambucca River after a steering gear failed on the 22/08/1878 while on a voyage from Sydney to Nambucca River.	Mid North Coast	Shipwrecks
Curlew	The Curlew was wrecked on the outer bar of the Nambucca River on the 16/02/1914.	Mid North Coast	Shipwrecks
Dove	The Dove was a wooden screw steamer wrecked on the Bowra River Nambucca Heads on the 28/07/1932.	Mid North Coast	Shipwrecks
Fingal	The Fingal sank after being torpedoed off Nambucca Heads on 5 May 1943 whilst on a voyage from Sydney to Darwin.	Mid North Coast	Shipwrecks
Helena Davies	The Helena Davies was lost after capsizing near Nambucca Heads on the 14/02/1891 while on a voyage from Sydney to Nambucca River.	Mid North Coast	Shipwrecks
Lady of Lorn	The 54 ton Lady of Lorn was a small timber vessel of 21.	Mid North Coast	Shipwrecks
Lombard	The Lombard was wrecked at Nambucca Heads in May 1867 while on a voyage from Gladstone to Newland.	Mid North Coast	Shipwrecks
Martha	The Martha was wrecked near the Nambucca River on the 12/02/1871.	Mid North Coast	Shipwrecks
Nambucca	The Nambucca was lost near Nambucca Heads on the 07/05/1934 while on a voyage from Sydney to Nambucca River.	Mid North Coast	Shipwrecks
Pelican	The Pelican was wrecked after springing a leak 3 miles north of Nambucca Heads in April 1888 while on a voyage from Nambucca heads to the Bellinger River.	Mid North Coast	Shipwrecks
Slippery Charlie	The Slippery Charlie was a 56-ton wooden schooner wrecked at Nambucca Heads in July 1866 while on a voyage from Sydney to Richmond River.	Mid North Coast	Shipwrecks
Thistle	The Thistle was a wooden carvel screw steamer wrecked near Nambucca Heads on the 09/08/1901 but was eventually refloated.	Mid North Coast	Shipwrecks
Thomas and Henry	The Thomas and Henry was a wooden carvel built brigantine wrecked on the south spit Flat Rock Nambucca Heads on the 18/06/1877 while on a voyage from Sydney to Nambucca Heads.	Mid North Coast	Shipwrecks
Undine	The Undine was wrecked on the Northern side of the Nambucca River after drifting onto rocks on the 31/01/1878.	Mid North Coast	Shipwrecks
Wellington	Although little is currently known of the history of this 38m screw steamer, Wellington Rock gained its name from this wreck event on 11 November 1892.	Mid North Coast	Shipwrecks
Zoe	Nambucca River, South Spit December 1877	Mid North Coast	Shipwrecks

Source: NSW Heritage, Maritime Heritage

10.0 Glossary

ASS	Acid Sulfate Soils
AHD	Australian Height Datum
ALLUVIAL	A deposition of sediment over a long period of time by a river; an alluvial layer; pertaining to the soil deposited by a stream (alluvium)
ANZECC	Australian and New Zealand Environment and Conservation Council.
CONGLOMERATE	is a rock consisting of individual stones that have become cemented together.
DECCW	Department of Environment, Climate Change and Water
DNR	Department of Natural Resources.
DOLORITE	is a mafic, holocrystalline, intrusive igneous rock equivalent to volcanic basalt
DL	Department of Lands
ELEOCHARIS	is a genus of 250 or more species the Cyperaceae (sedge family). They are known commonly as spikerushes
ELEOCHARIS WETLAND	wetland dominated by spikerushes
EPIPHYTIC ALGAE	algae existing on the surface of a plant or plant organ without causing infection (epiphyte)
EUTROPHICATION	is an increase in the concentration of chemical nutrients in an ecosystem to an extent that increases in the primary productivity of the ecosystem
ESD	Ecologically sustainable development
ha	Hectare
HACC	Home and Community Care services
ICOLL	Intermittently closed/open lakes and lagoons.
kl	Kilolitre.
L	Litre.
LAB	Liquor Administration Board.
LALC	Local Aboriginal Land Council
LEMP	Landfill Environmental Management Plan.
LEP	Local Environmental Plan.
m	Metre.
mg/L	Milligrams per litre.
ML	Megalitre.
mm	Millimetres.
NPWS	National Parks and Wildlife Service.
NRCMA	Northern Rivers Catchment Management Authority
NSC	Nambucca Shire Council
OFFENSIVE NOISE	means under POEO, noise: (a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances: (i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or (ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted
PALUDAL	pertaining to marshes, marshy, palustral, especially designating a plant's habitat
PASS	Potential Acid Sulfate Soils
PHYLLITE	is a type of foliated metamorphic rock primarily composed of quartz, sericite mica, and chlorite

Glossary Continued

<i>POEO</i>	<i>Protection of the Environment Operations Act 1997.</i>
PSR	Pressure-state-response model.
RIPARIAN	is the interface between land and a stream. Plant communities along the river margins are called riparian vegetation
RTA	Roads and Traffic Authority.
SANDSTONE	is a sedimentary rock composed mainly of sand-size mineral or rock grains
SCHISTOSE	laminated; having a formation resembling a schist - schists form a group of medium-grade metamorphic rocks
SLATE	a fine-grained metamorphic rock that can be split into thin layers
SEPP	State Environmental Planning Policy.
TERTIARY BASALTS	solidified lava from a geologic period 65 million to 1.6 million years ago
TRACHYTE	is an igneous, volcanic rock with an aphanitic to porphyritic texture

11.0 References

- Australian Bureau of Statistics (ABS) (2009) available [www.abs.gov.au]
- Australian Natural Resources Atlas (2009) available [www.anra.gov.au]
- Coffs Coast Waste available [www.coffscastwaste.com.au]
- Australian Commonwealth Scientific and Research Organization (CSIRO) (2009) available [www.csiro.au]
- Groves R.H, Boden R and. Lonsdale W.M (2005) *Jumping the Garden Fence - Invasive garden plants in Australia and their environmental and agricultural impacts*, A CSIRO report for WWF-Australia
- Department of Education , Employment and Workplace Relations (DEEWR) (2009) available [www.workplace.gov.au]
- Department of Environment, Climate Change and Water (DECCW) (2009) available [www.environment.nsw.gov.au]
- Department of the Environment, Water, Heritage and the Arts (2002) *Climate change impacts on biodiversity in Australia: Outcomes of a workshop sponsored by the Biological Diversity Advisory Committee*, 1–2 October 2002, Canberra
- Department of Natural Resources, (2006). DIPNR SoE Reporting Information (unpublished)
- Department of Natural Resources (DNR) (2009) available [www.naturalresources.nsw.gov.au]
- Department of Primary Industries (DPI) (2009) available [www.dpi.nsw.gov.au]
- Fitzgerald, M., (1996). *Flora and Fauna of Coffs Harbour Urunga State Forests – 6 Months Training Survey*.
- Indian Myna Bird Project Website for managing the invasion of Indian Myna birds on the Mid North Coast, available [www.indianmyna.org]
- Kendall & Kendall Ecological Services, (2003). *Nambucca Catchment Vegetation Survey*. Kendall & Kendall Ecological Services, West Kempsey.
- Lyll & Macoun Consulting Engineers, (1999). *Nambucca Valley River and Catchment Management Study*.
- Nambucca Shire Council Crime Prevention Plan 2008 – 2011 (2008) available [http://www.nambucca.nsw.gov.au/content/uploads/Crime_Prevention_Plan.pdf]
- NSW Maritime Heritage (2009) available [www.maritime.heritage.nsw.gov.au]
- NSW Heritage Office (2009) available [www.heritage.nsw.gov.au]
- OzCoasts (2009) Geoscience Australia, ACT, Australia, Available [www.ozcoasts.org.au]
- Roads and Traffic Authority (RTA) (2009) available [www.rta.nsw.gov.au]
- Smith P (1994) *Remnant Vegetation Conservation Significance – Nambucca Shire Council*, Department of Conservation and Land Management.
- WBM Oceanics Australia, (2000). *Nambucca River Estuary Processes Study*.
- West R. J, Thorogood C. A, Walford T. R and Williams R. J (1985) *An Estuarine Inventory for NSW, Australia* (Fishery Bulletin 2), Department of Agriculture.
- Townsend, N (1993) *Valley of the Crooked River, European settlement on the Nambucca*. NSW University Press.