Namoi
Catchment Action Plan

Part B
Natural Resource Management Plan

Approved by the
Minister for Natural Resources

January, 2007

Prepared by Namoi Catchment Management Authority

The Hon Ian Macdonald MLC
Minister for Natural Resources
January 2007
Minister’s Foreword

Our natural resources are our most precious asset. They underpin the prosperity of our society today, and will determine the wellbeing of the generations of tomorrow.

Today, more than ever, we are aware of the challenges facing our environment. Expanding population and industry can threaten the very natural resources which they survive upon. It is our task to ensure that sustainable practices are adopted so that our natural heritage is protected from these threats.

But the challenges faced vary enormously from region to region, and unfortunately do not come with a “one size fits all” solution.

We recognise that the people best-placed to combat these challenges, are the people that live in the community itself. That is why the Iemma Government has taken a new direction in natural resource management by creating our Catchment Management Authorities (CMAs), to face those challenges at a local level.

To tackle these issues, each CMA has developed its own Catchment Action Plan (CAP) in close consultation with their own communities – 13 in all.

13 unique plans to address the myriad of unique and complex issues experienced in each of the 13 regions. From the Coast to the Far West, the challenges faced and the solutions required are vastly different. As a consequence these CAPs are as diverse as the people and landscapes of our wonderful state.

There can be no doubt that the CAPs represent a major step forward in our quest for continuous improvement in natural resource management in NSW. Their development has also provided an invaluable opportunity to assess the present condition of our lands and waterways.

The purpose of the CAP is to provide a roadmap to ensure that we not just protect these resources but enhance them for the enjoyment and viability of future generations. The CAPs tell us not just where we need to go but how we should get there. Most importantly, we can monitor our progress against the CAPs, providing the trigger to alert us, should we take a wrong turn.

The 10-year CAP models complement other natural resource management plans, including regional strategies, water sharing plans and regional conservation plans. Intertwined, they provide us with the tools to take control of our future and ensure that we use our natural resources in an intelligent, balanced and sustainable manner. Importantly, CAPs also have a key role in addressing the priorities in the State Plan.

CAPs however, should not be thought of as an end in themselves. They are a living breathing document that will require revision as new information comes to hand, and as we learn from our experiences.

Within each CAP you will find a wealth of information about the natural resources of each catchment. As well as a blueprint for the future – management targets and goals for us all.

The NSW Government has endorsed this CAP following the advice of the Commissioner of the Natural Resources Commission to me, in my capacity as the Minister for Natural Resources.

I would like to personally thank the Chairperson, Board members and staff of the CMA for their tremendous commitment and hard work in preparing this CAP. Not only are they pioneering the NSW Government’s new statutory model, but they have also had to ‘hit the ground running’ – and succeeded admirably.

They have worked in partnership with local communities, farmers, environmental groups, Aboriginal communities, local governments, industry, as well as the NSW and Australian Governments to identify the highest priorities and investments for their particular catchment. This CAP is the result of a great deal of effort from people with wide-ranging backgrounds and views on natural resource management, working in a spirit of cooperation.
I would also like to thank the individuals, groups and organisations that contributed to this CAP’s development by either making submissions or contributing their time, knowledge and expertise during its development.

I commend this CAP to you, and urge you, your group or organisation to consider how you may take part in its implementation. The CMA’s contact details are available at www.namoi.cma.nsw.gov.au.

Let’s work together to manage our precious natural resources for generations to come.

The Hon Ian Macdonald MLC
Minister for Natural Resources
January 2007
Document Control Procedures

Controlled copy:
The latest version of the Catchment Action Plan can be found on the Namoi Catchment Management Authority website www.namoi.cma.nsw.gov.au.
Document control rests with the Strategic Planning Manager for the Namoi Catchment Management Authority, 155-157 Marius St Tamworth NSW 2340.
The only valid copy of the Catchment Action Plan is the one which shows the latest version number. This is described as when the document was last printed and can be found in the Version and Amendment List. All other copies are uncontrolled copies.

Version and Amendment List

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<td>Final Draft for Submission to NRC and Minister _V5</td>
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Chairman’s Foreword

Times change, Governments come and go, and policy is reworked, revised and, many times, just regurgitated from history. Plans are put in place and more often than not that’s where they stay - ‘some place’. Millions of dollars have been spent on many programs - planning, educating, researching, improving, monitoring, preaching!

Still, there is a great diversity of opinion, many times expert based, on the actual state of our resources and whether they are improving, in decline or static. Our knowledge of our most basic natural resources; soil, land, water, vegetation and people, and in particular what is happening to those resources, is sporadic, both in area and in detail. Consequently, the required management responses are, in some cases, equally poorly known and understood.

Our management has tended to be in the same vein as the short term election cycles, which force changes in policy direction. Our resources do not respect such short forays into their behaviour, nor do they have the ability to respond in these timeframes.

There needs to be changes in the way we manage our resources. We must change our time horizons, be more precise in the aspects that need continual watching, be more informed on the things we need to look out for and be more disciplined in our resolve to keep our resources healthy.

The Namoi Catchment Management Authority has articulated this change in mindset in the Namoi Catchment Action Plan. I commend this plan to everyone in the Namoi Valley and to all those who share our vision.

The Namoi Catchment Management Authority stands ready to provide the innovation, discipline and clear thinking that will be required. We talk the language of commerce and environment together. That’s what makes us different and makes the future so exciting.

The Namoi CMA will not be able to do any of this alone. Our commitment to success will stand beside the many others who also strive for the same ‘Vibrant Communities and Landscapes for the Future’.

Jim McDonald
Chairman
Namoi Catchment Management Authority
The Namoi Catchment Action Plan is an independent statutory authority governed by a Board reporting directly to the Minister for Natural Resources. The Namoi CMA was established in 2004, and operates under the Catchment Management Authorities Act 2003, which requires the CMA to develop a Catchment Action Plan.

The Namoi CMA Environmental Policy, determined by the Board, sets the context for achieving the vision:

"Vibrant Communities and Landscapes for the Future."

"The Namoi CMA stands ready to provide the innovation, discipline and clear thinking required to achieve this vision. We talk the language of commerce and environment together. That’s what makes us different, and makes the future so exciting."

Our environmental policy includes a commitment to consider environmental, social and cultural, and economic aspects in our decision making about Natural Resource Management (NRM) and the delivery of our programs.
The Namoi Catchment Action Plan is the strategic framework which will guide natural resource management in the Namoi Catchment over the next ten years. It is an innovative and visionary plan, based on good science, consultation and collaboration. All organisations, entities, communities and individuals involved in natural resource management in the Catchment are encouraged to adopt this framework and work with the Namoi CMA to implement the proposed programs and activities.

The Namoi CMA has collaborated with industry groups, scientists, government agencies, the community and interested individuals to develop the Catchment Action Plan. It built on the work of previous catchment management organisations in the Namoi over the last fifteen years. Significant changes in legislation and regulation have occurred since the Namoi Blueprint was written in 2002, including the Native Vegetation Act 2003 and the Water Management Amendment Act 2005. Additionally, new science is always discovering better ways of managing our resources. Consequently, a fresh analysis of the health of the Catchment and the most significant impacts affecting the Catchment was undertaken, as part of developing the Catchment Action Plan.

The Catchment Action Plan has given consideration to a wide range of National, State, regional and local planning policies, legislation, strategies and plans. It addresses the requirements outlined by Australian and State Government agencies to the Natural Resources Commission regarding the Single Process for Review of Catchment Action Plans.

The Catchment Action Plan establishes Catchment and Management Targets which address significant impacts on the four key regional ‘resources’ – native plants and animals, surface and ground water ecosystems, the landscape and people and their communities. The Management Targets define the desired outcomes for each resource and Management Actions provide the strategies to achieve these Targets. Activities are proposed for inclusion in Three-Year Rolling Investment Strategies, which detail how government funds will be allocated to the Management Targets and the progress that will be achieved with these funds, and in Annual Implementation Plans, which detail not only the distribution of government funds, but any contributions and activities our partners make to help achieve the CAP targets.

The Catchment Action Plan provides the foundation for delivering incentive funding provided through the Australian and State Governments Natural Resource Management Programs, as well as other funding available to the catchment community through partnerships and / or alternative funding opportunities. Additionally, incentive funding supports training and on-ground works, and is administered in line with Investment Principles which:

- consider the triple bottom line ie. environmental, social and cultural, and economic aspects;
- target high value assets and areas of greatest impact;
- achieve multiple outcomes and landscape change; and
- reflect public v private benefits.

A key feature of the Namoi Catchment Action Plan is working with industry, Landcare and environmental groups, research organisations, Local Government and the Indigenous community, as well as individuals. The Namoi CMA is seeking to establish collaborative investment partnerships that will assist the CMA to deliver proposed activities, increase the effectiveness of its investment funding programs and achieve positive natural resource outcomes.

The Namoi CMA has established comprehensive business systems, which strive to achieve best practice in delivering natural resource management outcomes. This includes monitoring, evaluation and review procedures at the project, program and organisational level to ensure that adaptive management occurs and results in continual improvement. These systems have been developed in line with the State-wide Standard for Quality Natural Resource Management.

The Catchment Action Plan will be reviewed regularly in light of evaluation of programs and projects, changes in science and knowledge, or the legislative and regulatory framework. It will be responsive to changing operating conditions, such as severe climatic conditions or economic downturns. Socio-economic analysis of the Namoi Region and the actions proposed in this Natural Resource Management Plan will provide information on which to refine the Catchment Action Plan, and minimise any negative socio-economic impacts on the catchment community.

The Namoi CMA has developed two documents which make up the Namoi Catchment Action Plan. They are: Part A - Policies and Procedures for Quality Natural Resource Management which outlines all the operational and business policies and procedures which make up the business systems; and Part B – Natural Resource Management Plan, which details the Management Targets and their intent, and outlines the Management Actions and activities required to achieve these Targets.

Whilst both documents should be read in conjunction with each other in order to absorb the contents of the Namoi Catchment Action Plan, it is acknowledged that much of Part A is the document that guides the business of the Namoi CMA and may not be of great interest to the general community. However, Part B – The Natural Resource Management Plan - was specifically developed so as to provide the community with the clear strategic natural resource management focus, on which the Namoi CMA will be placing its efforts for the next decade, so as to achieve the most beneficial natural resource management outcomes for the Catchment.
1. Introduction

Natural Resource Management (NRM) encompasses all aspects of the environment – land, surface and ground water, and biodiversity, and the associated ecosystem or landscape functions. It also includes interaction between these components and importantly, the interface with people.

NRM includes consideration of the “triple bottom line” – environmental, social and cultural, and economic aspects, providing the foundation for sustainable industries and production.

The Namoi Catchment Action Plan (CAP), which includes this Natural Resource Management Plan (NRM Plan), is a strategic document which provides the framework and direction for managing these natural resources over the next decade. It provides a context for all potential partners and investors to achieve the vision:

“Vibrant Communities and Landscapes for the Future”.

This vision is part of the Namoi CMA Environmental Policy, agreed to by the Namoi CMA Board, which sets the context for all Namoi CMA decision making and operational activities.

The vision brings together all the natural resource elements, including people, and implies that we should strive to achieve an “ideal landscape” for the future, including:

- a healthy resource base capable of providing ecological sustainability and productive outcomes;
- a viable regional community showing growth and access to services; and
- socially satisfied communities, with minimal conflict and providing opportunities for people of all backgrounds.

The major components of natural resource management – landscape, surface and ground water ecosystems, native plants and animals, and people and their communities – are all assets and have been defined for this NRM Plan as “resources”. These resources are the foundation for the CAP and NRM Plan, providing the framework for:

- Impacts and State of the Catchment - Environmental Review (see CAP Part A and supporting documents);
- Medium to Long Term Vision - Catchment Targets;
- Strategic Direction - Management Targets;
- Investment Strategy and Milestones - Management Actions; and
- Implementation Plan - operational projects and activities to achieve the Targets and milestones.

The following NRM Plan describes the Catchment Target, Management Targets, Management Actions and possible activities for each resource.

**THE CATCHMENT ACTION PLAN IN A NUTSHELL**

“Vibrant Communities and Landscapes for the Future”

The CAP and NRM Plan have been written as “dynamic” documents, and will be subject to regular review and revision. All information supporting the CAP and NRM Plan, including reference material and the documents produced during CAP development, are available as hyperlinks or in electronic format through the Namoi CMA website. This will ensure that information can be readily updated and be accessible to Namoi CMA staff, key stakeholders, industry and community members.
Catchment Targets and Management Targets


Management Targets address issues identified as having the most significant impact on the four catchment resources; the landscape, people and their communities, native plants and animals, and surface and ground water ecosystems. The associated Management Actions will direct the activities of the Namoi CMA and the Catchment community in achieving these Targets. The Management Targets should be specific, achievable, realistic, and measurable, or else include priority actions to establish benchmarks and performance indicators. Management Targets have a timeframe of ten years or less. Actions to achieve the Management Targets in the NRM Plan have been defined as starting immediately the CAP is approved.

Four Catchment (Resource Condition) Targets ie. one for each key resource, are also described. Catchment Targets are a statement of future goals about the desired condition of the resource. These Resource Condition Targets provide a broad indicator of catchment health. Progress towards these Targets will be realised through the cumulative benefit of the Management Targets. These benefits are mapped in the Monitoring and Evaluation Plan and described in the Investment Strategy.

In the Namoi, the Catchment Targets and Management Targets will require benchmarks to be established before quantitative targets can be set. Activities have been identified for all Management Targets which will:

- acquire the necessary information;
- set benchmarks;
- establish quantitative targets and timeframes;
- define performance indicators; and
- determine future monitoring requirements.

In the short to medium term (within three years), Management Targets and Actions will be amended to be more specific and quantifiable as the necessary information to establish benchmarks and determine the realistic potential for possible progress becomes available.

The Namoi CMA does not wish to limit its vision of what may be achievable through the CAP by setting targets that can be measured by existing or envisaged government funding. One of the requirements under the National Framework for Natural Resource Management Standards and Targets (April 2003) (p4) is that “targets must be pragmatic and achievable”. State Government requirements stipulate that targets must be “technically valid”. At this point in time, the Namoi CMA believes it does not have adequate benchmarking data to set pragmatic and technically valid Targets that simultaneously meet all the “SMART” criteria ie. specific, measurable, achievable, realistic and timebound.

Contractual agreements for funding are defined by the Investment Strategy, based on agreed milestones for specific outcomes to be achieved via the utilisation of Government investment funds. These outcomes are in line with Investor Preferences. The Namoi CMA will define the milestones with accompanying timeframes for Management Targets and Actions as part of its Three-Year Rolling Investment Strategies, once the level of government funding is announced. It is meaningless to assign quantitative milestones for targets or actions unless the level of funding is known.

The Management Targets and Management Actions defined in the CAP will provide the context for the development of Investment Strategy Targets in line with investment funding. The Investment Strategy Targets will be fully consistent with CAP Targets; however they will be “SMART”.

Further detail on implementation activities and progress toward achieving Targets and milestones through projects and on-ground works will be provided each year in Annual Implementation Plans. These include budgets covering all available funding, including industry and community partnerships. These partnerships have the potential to significantly supplement government funding. Consequently, setting targets in the CAP, without knowledge of the level of these additional contributions, would be meaningless. The Annual Implementation Plan allows the CMA to refine its program according to current conditions eg. climatic or market volatility etc.

Planning Framework

The Catchment Action Plan has addressed the requirements of the Australian Government agencies of Department of Agriculture, Forestry and Fisheries and the Department of Environment and Heritage. These requirements include National Resource Condition Matters for Targets outlined in the National Framework for Natural Resource Management Standards and Targets, and Joint Steering Committee Investor Preferences updated in December 2005.
The State Government requirements are detailed in the *Catchment Management Authorities Act 2003*. In addition, Catchment Action Plans need to be consistent with the Salinity Targets agreed to between the NSW Government and the Murray Darling Basin Commission. These Targets are described in the Basin Salinity Management Strategy 2001-15 and the NSW Salinity Strategy. All these requirements are outlined in advice from the Natural Resources Commission regarding the Single Process for Review of Catchment Action Plans.

The Natural Resources Commission has set State-wide Targets covering similar issues to those identified in the Namoi CMA’s Initial Environmental Review. The CAP Targets need to contribute to achieving the State targets. The Namoi CMA will demonstrate how its investments and activities have supported the State-wide Targets via established reporting processes.

The relationship between State-wide targets, National Resource Condition Matters for Targets and Investor Preferences of the Joint Steering Committee (JSC) and the Namoi CMA Management Targets and Management Actions are presented at the start of each section in the NRM Plan.

**Consistency with National, State and Regional Strategies**

In developing this CAP, including the NRM Plan, due consideration has been given to existing natural resource management strategies and plans. The CAP is considered to be consistent with the following National and State Strategies and provides a vehicle for implementing elements of those strategies and plans at the catchment scale:

- National Framework for NRM Standards and Targets;
- National NRM Monitoring and Evaluation Framework;
- Murray-Darling Basin Natural Resource Management Strategies;
- NSW Salinity Strategy;
- National Water Quality Management Strategy;
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC Guidelines);
- National Water Initiative;
- State Water Management Outcomes Plan (promotes the objectives of the *Water Management Act, 2000*);
- National Vegetation Framework;
- National Strategy for the Conservation of Australia’s Biological Diversity;
- NSW Biodiversity Strategy (and state recovery and threat abatement plans);
- National Weeds Strategy;
- NSW Weed Strategy.

The Namoi CMA is familiar with the numerous policies which have been developed at State and National level to implement these strategies. In addition, a number of manuals have been developed which will support the delivery of Best Management Practice throughout the Catchment.

This NRM Plan has addressed the legislative requirements under the *Catchment Management Authorities Act 2003*, which define the CMAs functions under the *Native Vegetation Act 2003*, the *Threatened Species Conservation Act 1995*, the *Water Management Act 2000* and the *Environmental Planning and Assessment Act 1979*. The NRM Plan has also considered the Matters of Environmental Significance under the Australian Government’s *Environment Protection and Biodiversity Conservation Act 1999*.

A number of Water Management Plans including Water Sharing Plans for the Namoi Regulated River; Unregulated River and Namoi Alluvial Groundwater Sources have been prepared or gazetted. The Namoi CMA has included the objectives of these plans in a Management Target focussing on Water Management Planning, and will oversee monitoring and review processes for implementation of these and future Water Sharing Plans.

**Institutional Landscape**

Delivery of the CAP and the associated Management Targets, Actions and Activities are not just the responsibility of the Namoi CMA. The proposed activities include many aspects that are or can be dealt with by other organisations. The Namoi CMA is committed to developing partnerships with these key players in NRM, who are described in brief below.

During the development of the CAP, the key stakeholder groups and the roles that these groups will play in assisting the Namoi CMA to implement the CAP Targets have been identified. The development of the CAP built on existing links within the Catchment community and forged new alliances between stakeholder groups.
Major Industries
The Initial Environmental Review for the CAP identified the broad industry sectors across the Catchment which had the potential to impact on our natural resources. The fourteen broad industry sectors that were identified were:

- Broadacre Livestock
- Dryland Cropping
- Horticulture
- Light Industrial
- Rural Residential
- Water Storages
- Land Managed for Conservation - State Conservation Areas, National Parks, Reserves
- Intensive Livestock
- Irrigated Cropping
- Forestry, including State Forests
- Mining
- Urban Residential
- Utilities and Infrastructure
- Other Public Land - Crown Lands, Travelling Stock Routes, Road Reserves, Recreation Areas

Most of these major industry sectors from across the Catchment were involved in development of the CAP and subsequent consultation on the Draft CAP document. The Initial Environmental Review and other aspects of the CAP identified Best Management Practice (BMP) as one of its key foci in achieving improvement in natural resource management and delivery of the Management Targets. These industry sectors represented in the Catchment are best placed to deliver BMP through their constituent networks and throughout the wider community. The Namoi CMA will encourage and foster strong linkages with industry, and work in partnership to develop relevant BMPs and to assist the delivery CAP Targets. A number of partnerships will be formed with the CMA and are actively working on BMP delivery or development eg. Namoi CMA - Cotton Catchment Communities CRC Partnership. Many of these industry sectors have associated research organisations. These research bodies are also important partners for the Namoi CMA to ensure that we keep abreast of the best available knowledge and practices and incorporate these into our business.

Local Government
The Namoi Local Government Group (NLGG), formed as an initiative of the Namoi CMA, will be an integral component in working towards the achievement of the CAP Targets. This Group is made up of representatives from the seven Local Councils and the Namoi CMA. The Namoi CMA is also a member of the Namoi Regional Organisation of Councils. Catchment issues such as sustainable land use, maintaining roadside vegetation and invasive species management are examples of where the Namoi CMA and Local Councils can work together towards achieving the CAP Management Targets.

The appointment of a Local Government Officer within the Namoi CMA provides a pro-active link through the Namoi Local Government Group to encourage integration of State and Local Government planning instruments with the Natural Resource Management Plan. Most councils are producing Rural Strategies or similar documents as the preliminary phase to production of their Local Environmental Plan.

Representatives and staff from local government have been actively engaged throughout the development of the Namoi CAP. The linkage between the Catchment Action Plan and other planning frameworks is addressed in the Natural Resource Management Plan.

Namoi Community
Within the Namoi Catchment, individuals and groups are undertaking practices and activities that support the CAP Targets, and have a substantial impact on resource condition. It is by acknowledging and supporting these existing entities as well as actively engaging and empowering the Catchment community that improvements in resource condition will be achieved. A range of representatives from both urban and rural sectors of the community were involved during both CAP development and consultation phases eg. the education and business sectors. The Namoi CMA Engagement and Communication Strategy will provide the framework for ongoing engagement activities. It will be supported by a Benchmarking Survey that will advance the capacity of the CMA to meet community needs and expectations, and provide a baseline of the current attitude, awareness and practices within the Namoi.

The Indigenous community provides advice to the Namoi CMA on Indigenous issues through the Namoi Aboriginal Advisory Committee (NAAC), made up of representatives from the nine geographic areas defined by the Aboriginal Lands Council boundaries. Other Reference Groups will be established as needed.

State Government Agencies
The roles and responsibilities of the State Agencies in NRM are extensive and varied, from regional planning advice and technical project support to research, monitoring, data storage and analysis. Additionally, a number of agencies are land managers eg. DEC and DPI (State Forests), and their activities contribute directly to the Targets, particularly the Native Plants.
and Animals Catchment Target. CMA staff are regularly in contact with agency staff, who provide a vital role in providing technical information and support to the CMA and our clients.

Staff from all regional state agencies with a role in natural resource management were involved and actively participated in the development of the CAP, and provided valuable input throughout the process. Involving the relevant agencies in CAP development endorsed and developed a clear understanding of what is required of the agencies in achieving the targets, and their relevant roles and responsibilities. A number of Service Level Agreements between Namoi CMA and State Agencies are under development. Once finalised, these Service Level Agreements will secure both the commitment and resources from the agencies that are required to work towards achieving the CAP Targets.

The following Sections (2 to 5) describe the Catchment and Management Targets, and associated Management Actions and Activities. The development of these Targets and Actions is described in Part A of the Namoi CAP - Section 3.1. The detailed information behind this NRM Plan, including References and supporting materials, can be found on the Namoi CMA website under CAP Development Documents - Knowledge and Data, Resource Summary Tables and Management Action Workshop Outcomes.

In the tables which follow for each Management Target, a column called ‘CMA Role’ has been included. This column indicates the level of the Namoi CMA’s responsibility for each of the Management Activities, and highlights the areas that the CMA believes there are other stakeholders, such as the ones described above, who can play a vital role in implementing the activities. These are coded in the tables as follows:

L = Leading role  
P = In partnership with others  
S = Supporting others who have the leading role.
2. People and their Communities

People are integral to Natural Resource Management (NRM).

- They influence changes in management and the length of time it takes to implement practice change - people make changes – not science or governments or advisors;
- They impact on the natural resources;
- They have perceptions about how these resources are used and people’s rights to do so; and
- They are affected by decisions made about resource utilisation.

As part of the Initial Environmental Review, the activities of fourteen industries / landuses, described in Part A of the Catchment Action Plan (CAP) were analysed for their impacts on the following socio-economic groups in the community:

- Rural operators
- Urban and rural residential community
- Socially disadvantaged people
- Business and industrial managers
- Indigenous people (Kamilaroi people)

The scope of the analysis was limited to the natural resource management impacts. The Namoi CMA is mindful of the social and economic implications of its decision making. Where possible, it will seek to enhance socio-economic outcomes through its decision making. However, the CMA does not have a charter to undertake social intervention in areas such as health, unemployment and welfare.

Most Local Government Areas (LGAs) in the Namoi Catchment have a social growth index below the state average. Tamworth and Narrabri are the only towns currently showing growth. There is a net flow of money and people out of the region. Prices paid for rural produce frequently don't account for the cost of environmental degradation. The result is that social and economic conditions in Namoi communities have fallen relative to metropolitan areas. In rural NSW, people are generally older, less educated, poorer, and have reduced access to health services than coastal or urban areas. Volunteerism is high, but there is burn-out in the NRM field. For example, a number of Landcare Groups are no longer functioning, and change is now often driven by individuals, not groups.

There are many positive impacts from the use of our natural resources, including the production derived from our highly fertile soils, coal and other minerals, and substantial groundwater reserves. These result in significant economic opportunities and benefits to rural communities, including income through employment, production or business. Economic growth leads to better access to services and utilities, improved lifestyle and amenity. However, some people are concerned about the off-site environmental impacts, and increased noise, transport and social problems from heavy industry.

Sizable parcels of land have been maintained in the Namoi for biodiversity conservation, with ecotourism and recreation as additional benefits.

However, some negative impacts were identified during the review including: poor protection of cultural heritage (European and Indigenous); inadequate transport and infrastructure; negative impacts on the environment, including invasive weeds and feral animals, poor water quality; and lack of access for some sections of the community to resources.

The area of land zoned for rural residential is increasing rapidly, as many people realise their desire to combine rural lifestyle with paid employment in towns. However, small landholdings cause many impacts, including overgrazing, erosion, potential contamination of groundwater from septic tanks and chemical misuse, and high levels of invasive weeds and pests. Additionally, it causes fragmentation of productive agricultural land and increases demand for costly infrastructure and services.

People’s response to the environment depends on their knowledge, awareness, skills, and attitudes - all of which need to be aligned before people change their practices. Financial support for NRM activity is of little value if these factors are not combined. There is a pressing need to build capacity in all aspects of NRM (including cultural, social, economic and environmental values), if the CAP targets and objectives are to be achieved. The Namoi CMA will seek to enhance socio-economic outcomes to the Catchment community through its investment decisions and programs.

The vision of “Vibrant communities and landscapes for the future” will only be realised if all people in the catchment are willing to get involved and invest in NRM to extend the effectiveness of government investment. The Targets under the People and their Communities Program will only be achieved if collaborative partnerships are successfully established with Local Government, education and training providers, industry groups, Landcare groups, Indigenous groups, media, environment and other community groups to address the socio-economic aspects of NRM, as well as the environment issues.
**Catchment Target – People and their Communities (CTP)**

**CTP - From 2006, there will be continual improvement in the ability of the people in the catchment to implement the Namoi Catchment Action Plan (CAP).**

**Intent:** The intent of this target is that there is an increase in people’s skills, knowledge, and capacity to invest in and adopt appropriate practices for NRM. In addition, there is a general improvement in the attitude and understanding of NRM issues by the whole community, in order that the outcomes of the CAP will be achieved, and the community will be socially and economically vibrant. These targets aim to encourage and support the cultural, social, economic and environmental values and aspirations of all people, including Aboriginal people.

The major Impacts on the Resource and Risk to Catchment Health analysed in the Initial Environmental Review and reported in the Resource Summary tables are as follows and will be addressed in the three Management Targets that underpin this Catchment Target:

- Limited skills and knowledge - is the most significant impediment to improving the management, investment and implementation of public and private natural resource initiatives (MTP 2);
- Cost of degradation not priced – resulting in a net decline of the catchment resource base at the expense of the catchment community (MTP 3);
- Declining incomes and reduced financial capacity - limit the financial capacity of landholders to invest in resource management training and on-ground works (MTP 2);
- Increasing competition for resources - targeting for investment and prioritisation of issues is necessary to contribute to the maintenance and improvement of the natural resource base (MTP 2);
- Gaps in knowledge and science – limit the development of Best Management Practice, and subsequent extension and education programs. There is a need for well targeted, strategic research, monitoring and evaluation to feed into NRM (MTP 1);
- Leadership and Engagement - there is a need to rekindle community involvement in NRM at all levels and forge new leadership and direction (MTP 1 and MTP 2).

The table below illustrates how the Targets in the Namoi Catchment Action Plan address the State-wide Targets, National Matters for Targets and Joint Steering Committee Investor Preferences.

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<th>National Matters</th>
<th>JSC Investor Preferences</th>
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<td>Community</td>
<td>None applicable</td>
<td>Ensure consistency with obligations under the Australian and State Govt Bilateral Agreements, and National and State Indigenous community policies. Promote Indigenous community participation in planning and delivery of Regional NRM outcomes. Build capacity of regional communities, including indigenous communities, and rural industries to understand, identify and apply improved NRM practices.</td>
<td>MTP1 – From 2006, continually improve people’s recognition of, and attitude to, NRM issues and appropriate management practices. MTP2 – From 2006, continually increase the level of participation in NRM activities and adoption of practices, which achieve the outcomes of the CAP. MTP3 - From 2006, improve the economic stability and well-being of people in the Namoi Catchment.</td>
<td>a) communication and awareness campaigns about natural resources and cultural heritage; b) engagement with key stakeholders; c) acquiring and managing knowledge. a) education and training programs covering all management targets; b) building partnership to assist with investment and delivery of CAP; c) determining the most effective ways of investing in NRM outcomes; d) providing staff to engage and support people in CAP activities; e) improving the capacity of people to adopt and manage change.</td>
</tr>
</tbody>
</table>

**Note:** All JSC Investor Preferences are covered to Management Target level within the CAP. JSC Investor Preferences for CMA Actions will be addressed in the Three-Year Rolling Investment Strategies.
<table>
<thead>
<tr>
<th>What Do We Want to Achieve? (Management Targets – People (MTP))</th>
<th>How Can the Namoi Community Make This Happen? (Possible Activities for inclusion in Investment Strategies and Annual Implementation Plans)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Awareness, Attitude and Knowledge</strong>&lt;br&gt;MTP1 – From 2006, continually improve people’s recognition of, and attitude to, NRM issues and appropriate management practices.</td>
<td><strong>Benchmarking, Monitoring and Evaluation:</strong>&lt;br&gt;• Establish Benchmarks of current awareness and attitude (using existing data and additional surveys).&lt;br&gt;• Determine Performance Indicators and develop quantitative targets for continual improvement of community attitude and awareness.&lt;br&gt;• Collect regular community feedback on CMA performance and monitor, using regular repeat surveys, outcomes of our awareness programs to assess the extent of improvement in people’s attitude and awareness.&lt;br&gt;<strong>Knowledge and Data</strong>&lt;br&gt;• Develop a research strategy to address gaps in NRM knowledge in Northern NSW&lt;br&gt;• Encourage collaboration between science organisations in NNSW to get integrated NRM outcomes.&lt;br&gt;• Where essential knowledge is not available, encourage and support funding applications for projects to acquire the science or data.&lt;br&gt;• Make science and knowledge available in a format and level suitable for the target audience, including staff, so people are better informed and the NRM debate is based on fact, not emotion.&lt;br&gt;• Provide opportunities and processes to ensure CMA staff are adequately skilled and up to date.&lt;br&gt;<strong>Planning and Organisations</strong>&lt;br&gt;• Identify key sectors of the community that impact on catchment health in order to focus delivery of CAP programs and communications.&lt;br&gt;• Determine key triggers or drivers to engage community and incorporate these into program delivery.&lt;br&gt;• Identify risks and barriers to delivery of CAP, and address through risk management and operational procedures.&lt;br&gt;<strong>Awareness, Skills and Engagement</strong>&lt;br&gt;• Develop and implement an NRM Communication Strategy, which reaches all the community, including implementation and Incentives&lt;br&gt;• Maintain a support system of Namoi CMA staff and other collaborators to increase community involvement and information transfer in NRM.&lt;br&gt;• Provide avenues for other organisations to inform the CMA of NRM activities in the Catchment.&lt;br&gt;• Run campaigns and events to raise community awareness about natural resources and cultural heritage and how to manage them for the future.&lt;br&gt;• Improve understanding of rural and natural resource issues by urban &amp; rural residential communities.&lt;br&gt;<strong>Implementation and Incentives</strong>&lt;br&gt;• Improve access for the Indigenous community to significant cultural heritage sites and help Aboriginal people gain and retain management of these sites.&lt;br&gt;• Identify and conserve cultural heritage sites.&lt;br&gt;• Champion successful local operators / landholders using Best Practice to drive on-ground change.</td>
</tr>
</tbody>
</table>
| **What Do We Want to Achieve?**  
(Management Targets – People (MTP)) | **How Can the Namoi Community Make This Happen?**  
(Possible Activities for inclusion in Investment Strategies and Annual Implementation Plans) | **CMA Role** |
|---|---|---|
| **Skills, Incentives and Participation**  

MTP2 – From 2006, continually increase the level of participation in NRM activities and adoption of practices which achieve the outcomes of the CAP.  

This will be achieved through the following management actions:  

a) education and training programs covering all management targets;  
b) building partnerships to assist with investment and delivery of the CAP;  
c) determining the most effective ways of investing in NRM outcomes;  
d) providing staff to engage and support people in CAP activities; and  
e) improving the capacity of people to adopt and manage change.  

**Intent:** To achieve NRM outcomes, widespread engagement of all natural resource managers needs to occur. The proposed actions require on-ground staff of the CMA and other advisors, to engage these managers, particularly in priority landscapes. This includes Indigenous people so cultural heritage issues can be addressed.  

Improvement in skills provides opportunities for people to learn from each other and work together to increase social capital and strengthen the community to work towards sustainable NRM outcomes.  

While all resource managers have a legal and inherent responsibility to good stewardship of the resource of which they are custodians, there is an element of public good in most NRM activities that warrants the investment of public and community dollars. It is in this area that incentive funding will be utilised. Many managers have looked after their land so well that these people now “own land” that is of high conservation value. Recognition of this additional effort is needed if the Namoi CMA is to encourage people to maintain that level of management.  

**The key positions responsible** for achieving this target within the Namoi CMA are:  

- Program Manager – Operations, Catchment Coordinators and Field Staff  
- Catchment Project Officers - Education and Community Partnerships.  
- Catchment Officers – Community.  

**Potential collaborators** to assist in achieving this target include:  

Education organisations eg. TAFE, Adult education, Schools, Industry groups, State Agencies, and land managers. Additional collaborators will be identified during project development.  

**Benchmarking, Monitoring and Evaluation**  

This management target will be measured by the amount of change achieved through CMA investment in the following areas: a) the level of NRM skill of natural resources managers; b) investment in NRM by government, partners and resource managers, including in-kind contributions; c) the extent of community participation and commitment, numbers of people and organisations involved; d) the level of implementation of activities which contribute to the CAP.  

**Benchmarking, Monitoring and Evaluation**  

- Establish benchmarks of NRM skills, investment and levels of participation, using existing information and additional surveys.  
- Determine Performance Indicators and develop quantitative targets for continual improvement in NRM skills levels, investment and participation.  
- Monitor outcomes of education and incentive programs to assess improvement in skills, investment and participation, through regular data collection, including review of milestones in CMA contracts.  

**Awareness, Skills and Engagement**  

- Develop and implement an Engagement and Consultation strategy which reaches the key sectors of the community, and provides a means of ongoing feedback and review.  
- Establish and maintain consultation with clients and stakeholders regarding their NRM needs, including Reference Groups as appropriate eg. Indigenous, Local Government, environment, industry.  
- Provide NRM representation or input into regional consultative processes as appropriate.  
- Identify drivers of change and adopt both established and innovative delivery mechanisms to engage key stakeholders into activities and NRM participation generally, including younger farmers, non cohesive groups and apathetic managers.  
- Maintain a network of Namoi CMA support staff ie. project development, technical and educational staff, to increase community participation in NRM, and to provide current NRM knowledge to managers across all Management Targets.  
- Communicate widely how the incentive funding and on-ground works programs operate.  
- Up-skill resource managers through education, training, extension and advisory activities, utilising both groups and individuals as appropriate, to support the delivery of all Management Targets.  
- Provide training and support to embrace and manage change, including climate change and variability.  
- Train Indigenous people, especially younger people, in site identification so site assessment skills are available across the catchment.  
- Provide education and awareness packages especially tailored and targeted at the rural residential dwellers, in order that they better understand their impact on the environment and the regulatory environment they operate within.  
- Combine skills training with implementing on-ground projects.  
- Document case studies showing economic and environmental benefits of managing land sustainably.  

**Implementation and Incentives**  

- Support the Indigenous Community to be involved in NRM activities through employment of Aboriginal support staff to build capacity to participate in projects and advisory roles.  
- Develop programs and provide incentives targeted to catchment priorities, and the most effective locations to achieve the investment principles outlined in the Namoi CMA Environmental Policy.  
- Investigate and, where appropriate, implement stewardship payments or other incentive options or policy tools to achieve long term NRM outcomes, including rewarding people for good management, and trialling innovative ideas.  
- Investigate alternative investment models and sources of funding from the non-government sector to provide a more flexible and / or alternative investment options.
### Social and Economic Considerations

**MTP3 - From 2006, improve the economic stability and well being of people in the Namoi Catchment.**

This will be achieved by the following management actions:

- a) delivering programs that support the productive, profitable and sustainable use of natural resources, including new and emerging resource uses;
- b) understanding the social and economic environment in the Namoi Catchment;
- c) including socio-economic parameters in program and project design, assessment, implementation and evaluation; and
- d) mitigating negative socio-economic impacts of CAP programs and activities.

**Intent:** The Namoi CMA is committed to NRM decision making that will consider the “triple bottom line” so as to achieve Integrated Catchment Management, sustainable industries, good NRM outcomes and a viable economy where all sectors of the community can achieve their aspirations.

In order to achieve this objective, information and methodology is required to enable social and economic considerations to be incorporated into program design and project assessment. Best Management Practice strives to achieve a win-win outcome. However, public funding needs to be provided to meet the costs of change where “public good” benefits are not able to be funded by the land manager.

**The key positions responsible** for achieving this target within the Namoi CMA are:

- Economist – Dept Primary Industries secondee
- Program Manager, Operations
- Monitoring and Evaluation Coordinator
- Catchment Officer – Community Partnerships (Regional Facilitator)

**Potential collaborators** to assist in achieving this target include:

Industry groups, Research organisations, ABARE, Regional organisations eg. NENWACC, NENWRDB, State Agencies, NGOs, and land managers. Additional collaborators will be identified during project development.

**Benchmarking, Monitoring and Evaluation**

Benchmarking is being established through a Socio-Economic Assessment of the Namoi Catchment Action Plan. This study will also start to identify possible methodology for including social and economic parameters into project and program design and assessment. Further work and monitoring will be required to evaluate how successful these approaches have been in achieving the overall outcome of economic stability and well being.

<table>
<thead>
<tr>
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<th>How Can the Namoi Community Make This Happen? (Possible Activities for inclusion in Investment Strategies and Annual Implementation Plans)</th>
<th>CMA Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmarking, Monitoring and Evaluation</td>
<td>Establish benchmarks of current regional economic and social indicators as part of the Socio-Economic Analysis of the Namoi CAP being undertaken by CARE (March 2006).</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Update benchmarks when 2005-6 ABS data becomes available, and Namoi Input-Output tables are revised.</td>
<td>L</td>
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<tr>
<td></td>
<td>Select Performance Indicators to measure whole of catchment prosperity and social health, and develop quantitative targets for continual improvement.</td>
<td>L</td>
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<tr>
<td></td>
<td>Review indicators and evaluate change in socio-economic indicators relative to environmental change and impact every five years when new ABS data is released (ie. 2007, 2012, 2017).</td>
<td>L</td>
</tr>
<tr>
<td>Knowledge and Data</td>
<td>Coordinate data collection and support economic, social and environmental progress in the region through partnerships linking NRM with broad community initiatives, business, industry and regional bodies involved in economic development eg. NENWACC, NENWRDB and large industries.</td>
<td>P</td>
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<td></td>
<td>Undertake socio-economic studies on CAP programs and, as appropriate, government programs impacting on NRM in Namoi.</td>
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<td></td>
<td>Establish the true value of resources eg. water, and cost / compensate accordingly.</td>
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<td></td>
<td>Investigate non-traditional land uses and markets, including “clean and green” options.</td>
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<td></td>
<td>Investigate the opportunities for ecotourism in partnership with environment groups.</td>
<td>L</td>
</tr>
<tr>
<td>Planning &amp; Organisation</td>
<td>Consider the “triple bottom line” in all NRM decisions. ie. environmental, social and cultural, and economic aspects.</td>
<td>L/P</td>
</tr>
<tr>
<td></td>
<td>Include assessment of cultural heritage in the landscape as part of CMA project and program selection.</td>
<td>L</td>
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<tr>
<td></td>
<td>Investigate ways of including social and economic aspects in program design, and determine parameters that can be included in project assessment.</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Investigate the true costs and returns of CAP activities, the extent and value of public benefit in CAP programs, and incorporate these into project assessment.</td>
<td>L</td>
</tr>
<tr>
<td>Implementation and Incentives</td>
<td>Investigate market based instruments eg. pollution or carbon credits, which might support change.</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td>Provide timely and accurate information so people can confidently make informed business decisions and manage change.</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Educate people about what the “triple bottom line”, “public and private benefits” and “trade offs” means.</td>
<td>L</td>
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<tr>
<td></td>
<td>Deliver programs that support profitable and sustainable use of our natural resources, while maintaining prosperity and social well-being.</td>
<td>L</td>
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<tr>
<td></td>
<td>Mitigate the social and economic impact of the CAP on communities through targeted incentives.</td>
<td>L</td>
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<tr>
<td></td>
<td>Co-invest with organisations that can achieve social outcomes through NRM projects.</td>
<td>L</td>
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<tr>
<td></td>
<td>Provide employment opportunities for unemployed and Indigenous people through NRM works programs eg. CDEP, Green Corps, low security prisoners etc. These employment groups could be utilised on public land and, at the landholders’ discretion, also on private land.</td>
<td>S</td>
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</tbody>
</table>
3. The Landscape

The landscape includes soils, geomorphology and topography, surface and ground water, biodiversity and mineral resources, as well as landscape functions such as water, nutrient and energy cycling, and habitat functions. The Namoi Catchment supports a diversity of landscapes, ranging from the Liverpool, Warrumbungle and Kaputar Ranges, all of which include National Parks, through the rolling hills of the sedimentary slopes to the open floodplains of the Liverpool Plains and Darling Riverine Plains in the western part of the Catchment.

Healthy soils are a fundamental element of vibrant landscapes. The relatively young volcanic geology of the region, and extensive alluvial floodplains derived from these materials, has resulted in much of the Namoi Valley with very productive heavy black and grey clays, sought after for farming and irrigation. However, the impact of agricultural systems on the soil resource resulted in more than 10% of the Namoi Catchment being moderately to severely eroded in the early 1990s. More recently, the extent of erosion has declined in some farming areas due to reduced tillage farming practices.

Many parts of the landscape have been excessively cleared, including cropping land on the lower slopes, and much of the grazing country on the upper slopes and tablelands. Grazing land, particularly on the western slopes and plains, still retains native grasses, but much of the over-storey has been removed. A reluctance in broad acre livestock production to de-stock during extended dry periods, and overgrazing by some operators and rural residential owners results in pastures with high levels of invasive weeds, low levels of ground cover and poor species diversity.

Other soil issues that impact on catchment health and productive capacity include acidification due to fertiliser application, particularly in improved pastures and intensive cropping, sodicity (widespread to the west), and soil structure and fertility decline, particular in the lighter red soils under cropping.

Chemical management has markedly improved in the irrigation industry in the last decade, as seen by reduced chemical loads in the river; however, inappropriate use in other industries, including dryland farming, grazing and manufacturing industries and landfill can potentially result in contamination to surface and ground water or localised sterilisation of land.

Deep drainage under annual crops and pastures can cause salt mobilisation. Salinity scalds are becoming more common on the Liverpool Plains, and across the Maules, Goonoo Goonoo and Manilla Creek subcatchments. There is some risk of irrigation salinity, particularly if salinity levels in the river rise, or irrigators resort to using salty groundwater during droughts, both of which result in higher salt loads being applied through irrigation.

While the ABS data indicates a decline in mining production at the last census (2001), this is expected to be substantially reversed over the next few years, with plans to exploit coal reserves at Boggabri, Breeza Plains and Werris Creek. This expansion will potentially highlight land use conflict issues, infrastructure demands, and potential environmental implications that will need to be managed through integrated State and local planning, which incorporate the objectives of the CAP.

The key to addressing these impacts is the application of Best Management Practice (BMP) in conjunction with landscape planning which integrates subcatchment needs with the aspirations of individual property owners. Some industries have already prepared BMP guidelines to assist their operators to adopt environmentally sustainable, socially responsible and economically viable production practices. A notable example is the cotton industry, which has extended its BMP manual to include Land and Water practices. The horticultural industries have also produced BMP manuals.

Guidelines are available to guide rural residential practices, but a concentrated extension effort is required if improved management is to be realised in the peri-urban areas. Manufacturing, utilities and mining industries are generally covered by strong legislation and regulation under the Protection of the Environment Operations Act 1997. A number of other industries have produced Environmental Management Systems (EMS) guidelines for their producers.

The research and development corporations (RDCs) associated with the grain (GRDC) and livestock industries (MLA and AWIL) have undertaken extensive research in northern NSW, and much of the science is available. However, this has not been collated into readily usable BMP guidelines to cover all aspects of production. The Namoi CMA will facilitate the development of BMPs for summer dominant rainfall zones for industries where they are not currently available, and promote and support adoption of BMPs or Industry Codes of Practice. It will also invest in on-ground works to restore and rehabilitate degraded landscapes, particularly in areas that are likely to impact on catchment health and CAP targets. Provision of training and land use planning e.g. property, subcatchment or regional planning, will assist land managers achieve these aims.

The Namoi CMA is seeking collaborative partnerships with managers of private and public land, agribusiness including advisors, rural merchandise suppliers, financial service providers and Landcare Groups. Additionally, research organisations, Local Government and State agencies will also be important players if the objectives of The Landscape Program are to be achieved.
Catchment Target – The Landscape (CTL)

CTL – From 2006, there will be an increase in the extent of the landscape managed sustainably.

Intent: The aim of this target is to improve soil condition and landscape health and functioning. The focus is not only on all rural land managers, but also other industries such as mining, intensive industries, public land managers, developers, local government, as well as peri-urban communities and urban dwellers. To achieve this target, programs based on Best Management Practice which deliver on-ground change and promote sustainable systems to restore and rehabilitate key degraded landscapes. Land use change will be encouraged where the current land use is not sustainable, and property and subcatchment planning will provide the framework to achieve healthy landscapes. Training opportunities and access to information about natural resource management (NRM) issues will be provided. Alliances with State and Local Government authorities to encourage inclusion of catchment management objectives in their regional and rural strategies and management plans will help integrate land use planning and the CAP.

The major impacts on the Resource and Risk to Catchment Health analysed in the Initial Environmental Review and reported in the Resource Summary tables are as follows and will be addressed in the three Management Targets that underpin this Catchment Target:

- MTL 1 – Best Management Practice (BMP);
- MTL 2 – Land Capability;
- MTL 3 – Integrated Planning.

- Irrigation, dryland and urban salinity and deep drainage (MTL1)
- Soil sodicity and soil acidification (MTL1)
- Wind and water erosion, soil structure and fertility decline (MTL1)
- Scalded and saline land, and other land degraded due to inappropriate land use (MTL 2)
- Contamination and land isolation (MTL3).

The table below illustrates how the Targets in the Namoi Catchment Action Plan address the State-wide Targets, National Matters for Targets and Joint Steering Committee Investor Preferences.

<table>
<thead>
<tr>
<th>NRC State-wide Targets</th>
<th>National Matters</th>
<th>JSC Investor Preferences or CMA Act 2003</th>
<th>CMA Management Targets</th>
<th>CMA Management Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>Land salinity</td>
<td>Protect and improve the condition of land, water and vegetation resources that underpin our natural ecosystems and productive agricultural industries. Increase sustainable resources use.</td>
<td>The Landscape</td>
<td>MTL1 – From 2006, increase the area of land managed according to BMP.</td>
</tr>
<tr>
<td></td>
<td>Soil condition</td>
<td></td>
<td></td>
<td>a) developing and / or extending BMP in partnership with industry; b) assisting the adoption of industry based BMP through technical support and incentives.</td>
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<tr>
<td>10. Improvement in soil condition</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>a) property management planning and subcatchment planning;; b) changing land use in areas where land is currently being used for a purpose not consistent with the capability of the land; c) partnerships with new and emerging industries.</td>
</tr>
<tr>
<td>11. Increase in the area of land that is managed within its capability</td>
<td>Prevent, stabilise and reverse trends in dryland salinity affecting the sustainability of production, conservation of biological diversity and viability of infrastructure.</td>
<td>MTL2 – From 2006, increase the area of land used in accordance with land capability.</td>
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<tr>
<td></td>
<td></td>
<td>Environmental Planning &amp; Assessment Act 1979</td>
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Note: All JSC Investor Preferences are covered to Management Target level within the CAP. JSC Investor Preferences for CMA Actions will be addressed in the Three-Year Rolling Investment Strategies.
**What Do We Want to Achieve?**

(Management Targets – Landscapes (MTL))

**Best Management Practice (BMP)**

MTL1 – From 2006, increase the area of land managed according to Best Management Practice.

This will be achieved by the following management actions:

- developing and / or extending BMP in partnership with industry; and
- assisting the adoption of industry based BMPs through technical support and incentives.

**Intent:** The intent of this target is to promote and facilitate the adoption of best management practices for all industries and landuses, so as to achieve improved landscape health. The focus is on rural land managers and non-rural industries alike. The term “BMP”, as used throughout this Plan, includes industry guidelines, Environmental Management Systems and other quality assurance programs.

This Management Target contributes benefits to the other Catchment and Management Targets. In the Namoi Catchment, land management is the key to improving salinity and water quality. BMP covers all aspects of natural resource management – not just the land surface, soils and production based landuse. It includes nutrient and energy cycling, geology and minerals, soil biota, ecology, biodiversity, land based native plants and animals, habitat, water balance and cycling, surface and ground water, riverine ecosystems and associated plants and animals, floodplain management and replenishment. The adoption of BMP addresses the impacts from environmentally unsustainable landuse.

BMP needs to be customised for different enterprise mixes, landscapes and soil types, climates etc. It should be flexible and constantly reviewed to allow for changes in technology and other aspects of the operating environment. Climate change is an overarching issue that needs to be addressed in all aspects of BMP – crop production, livestock selection as well as environmental aspects.

**The key positions responsible** for achieving this target within the Namoi CMA are:

- Technical Officers – Salinity and Soils (supported by technical officers for water ecosystems and native plants and animals)
- Program Manager, Operations and Catchment Coordinators.

**Potential collaborators** to assist in achieving this target include:

- Land managers, Rural Industry organisations, Research organisations, agribusiness, State Agencies. Additional collaborators will be identified during project development.

**Benchmarking, Monitoring and Evaluation**

Monitoring and evaluation will be based on changes in management practices across the whole catchment as determined by survey, with supporting output information from the Namoi CMA contract database, which will provide the area changed using investment funds.

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**How Can the Namoi Community Make This Happen?**

(Possible activities for inclusion in Investment Strategies and Annual Implementation Plans)

<table>
<thead>
<tr>
<th>Benchmarking, Monitoring and Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Establish benchmarks of current land management practices and rate of uptake of BMP across the key industries in the Namoi catchment according to priority (using existing information from agribusiness and industry and supplementing with additional surveys).</td>
</tr>
<tr>
<td>- Determine Performance Indicators, including defining “levels of BMP”, and develop quantitative targets for the increase in land managed under BMP. Updated salinity data will provide the basis for a land based salinity target.</td>
</tr>
<tr>
<td>- Monitor increase in BMP uptake by undertaking data collection, including repeat surveys every five years, and review of milestones in CMA contracts.</td>
</tr>
<tr>
<td>- Implement appropriate project monitoring to ensure recommended BMP is working effectively.</td>
</tr>
</tbody>
</table>

**Knowledge and Data**

- In partnership with industry, develop BMPs manuals or industry guidelines for industries not already operating under BMP (eg cropping and livestock). |
- Support creative and innovative research opportunities and new technologies relevant to the Namoi to acquire information to enable continual improvement to BMP. |
- Utilise the best available science and information, including local knowledge and innovation, to ensure that BMP manuals and guidelines are up to date and consistent with current best practice.

**Planning**

- Use the Land Management Unit framework for the catchment as a means of defining BMPs spatially. |
- Identify hotspots and target hotspots and specific industries, to increase awareness and uptake. |

**Awareness, Skills and Engagement**

- Promote BMPs for industries where BMPs or industry codes of practice are available (e.g. cotton). |
- Provide skills training to support the adoption of BMP, including education eg. grazing management programs, field days, demonstrations, and case studies, highlighting triple bottom line outcomes. |

**Implementation and Incentives**

- Make available technical expertise to provide advice to land managers and assist with the development of projects which facilitate the adoption of BMPs. |
- Develop and maintain industry partnerships to encourage their constituents to manage their enterprises according to BMP and land capability, and invest in all aspects of sustainable land management. |
- Provide incentives to adopt land management changes consistent with BMPs, including practices such as grazing management, tillage practices, precision agriculture and irrigation techniques, which minimise deep drainage, salinity risk, chemical contamination, pollution and erosion, or improve soil health, water use efficiency, ground cover etc. |
- Provide incentives, in conjunction with improved land management practices, to rehabilitate eroded areas, erode channels, and private land management, particularly in the grazing industries, to encourage managers to maintain BMP including adequate groundcover requirements, during periods of below average rainfall. |
- Support public land managers to manage their land according to BMP. |
- Support “drought” management programs, particularly in the grazing industries, to encourage managers to maintain BMP including adequate groundcover requirements, during periods of below average rainfall. |

**CMA Role**

- L
- L
- L
- L
- P
- P
- P
- P
- P
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<table>
<thead>
<tr>
<th>What Do We Want to Achieve? (Management Targets – Landscapes (MTL))</th>
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<th>CMA Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Capability</td>
<td>Benchmarking, Monitoring and Evaluation</td>
<td>L</td>
</tr>
<tr>
<td>MTL2 – From 2006, increase the area of land used in accordance with land capability, as measured by Land Management Units based on the Land and Soil Capability Index.</td>
<td>• Establish benchmarks of current landuse compared to Land Management Units recommendations (using existing landuse data sets).</td>
<td>L</td>
</tr>
<tr>
<td>This will be achieved by the following management actions:</td>
<td>• Determine Performance Indicators and develop quantitative targets for continual improvement.</td>
<td>L</td>
</tr>
<tr>
<td>a) property management planning and subcatchment planning;</td>
<td>• Evaluate progress towards targets by analysing updated landuse data where available and contract milestones.</td>
<td>L</td>
</tr>
<tr>
<td>b) changing land use in areas where land is currently being used for a purpose not consistent with the capability of the land; and</td>
<td>Planning</td>
<td>P</td>
</tr>
<tr>
<td>c) partnerships with new and emerging industries which provide viable alternative landuse options.</td>
<td>• Develop a Soil and Land Capability Index for the catchment.</td>
<td>L</td>
</tr>
<tr>
<td>Intent: The intent of this target is to ensure that the landuse on any parcel of land doesn’t inherently cause degradation. In some cases, the activities associated with a landuse will cause degradation, regardless of whether BMP is practiced. Examples of this could include continuous cropping on light textured soils, which would result in soil structure decline, deep drainage and mobilisation of salts; or cropping on steep slopes where removal of perennial ground cover will result in erosion and subsequent decline in water quality. More subtle examples could relate to native plants and animals, where the lack of native vegetation results in the absence of a corridor to allow wildlife movement, and hence restricts the opportunity for recovery of threatened fauna populations.</td>
<td>Develop Land Management Units (LMUs) and recommended landuses and practices for the Namoi Catchment incorporating the Soil and Land Capability Index, salinity hazard based on groundwater flow systems information and other available datasets as appropriate.</td>
<td>L</td>
</tr>
<tr>
<td>Land Management Units (LMUs) is a general classification that allows the capability of the land to be broadly categorised for a number of uses. LMUs provide a guide to the land capability, suitable land use and recommendations for land management at the subcatchment and property planning level. LMUs are based on the Land and Soil Capability Index, which focus on the classification of land into different classes according to its capability, soil type, slope, aspect, microclimate and physical limitations. When the Land &amp; Soil Capability Index is combined with Groundwater Flow Systems and other salinity hazard information, LMUs can be defined. LMUs are an effective tool on which to base property and subcatchment planning &amp; implement sustainable land use and management.</td>
<td>Determine priority landscapes to target landuse change; particularly areas where salinity risk and water quality issues originate.</td>
<td>L</td>
</tr>
<tr>
<td>The key positions responsible for achieving this target within the Namoi CMA are:</td>
<td>Identify land capability hotspots for priority landscapes / sites, industries and communities to improve awareness and participation and target for change.</td>
<td>L</td>
</tr>
<tr>
<td>Property Planners Catchment Coordinators and Field Staff</td>
<td>Promote and deliver integrated subcatchment and property management planning, and where possible integrate with Property Vegetation Plans.</td>
<td>L</td>
</tr>
<tr>
<td>Potential collaborators to assist in achieving this target include:</td>
<td>Knowledge and Data</td>
<td>S</td>
</tr>
<tr>
<td>Land managers, Rural Industry organisations, Research organisations eg RIRDC and State Agencies. Additional collaborators will be identified during project development.</td>
<td>• Encourage innovative research and sharing of expertise.</td>
<td>S</td>
</tr>
<tr>
<td>Benchmarking, Monitoring and Evaluation - Monitoring and evaluation will be based on changes in landuse across the whole catchment as determined by survey, with supporting output information from the Namoi CMA contract database, which will provide the area of land use changed using investment funds.</td>
<td>Investigate options for alternative economic returns from landuse change including carbon and salinity credits, and markets for environmental services and products.</td>
<td>S</td>
</tr>
<tr>
<td>Implementation and Incentives</td>
<td>Awareness, Skills and Engagement</td>
<td>L</td>
</tr>
<tr>
<td>• Develop and implement programs and provide incentives and other policy tools to assist people to change their enterprise mix to landuses that are consistent with the capability of the land.</td>
<td>• Extend information about LMUs and their recommended landuses and management practices.</td>
<td>L</td>
</tr>
<tr>
<td>• Target areas requiring landuse change for innovative or emerging industries suited to the landscape.</td>
<td>• Deliver advice, skills and information to enable landuse change through technical staff and other practical mechanisms.</td>
<td>P</td>
</tr>
<tr>
<td>• Support the development and introduction of new markets for emerging industries, such as tree crops, “traditional” indigenous landuses, or environmental services.</td>
<td>Target areas requiring landuse change for innovative or emerging industries suited to the landscape.</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
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</tbody>
</table>
**What Do We Want to Achieve?**

*(Management Targets – Landscapes (MTL))*

**Integrated Planning**

MTL3 - By 2010, the planning strategies and instruments of state government and four local governments will be consistent with the objectives of the Namoi CAP.

This will be achieved by the following management actions:

- **a)** partnerships with local government;
- **b)** recognising key agricultural, environmental, cultural and community assets and protecting these through planning instruments;
- **c)** including provisions in local and regional strategies and local government management plans, which facilitate the achievement of the CAP targets;
- **d)** implementing urban and industrial BMPs, including water use efficiency and water quality measures; and
- **e)** producing Catchment-wide State of the Environment (SoE) Reports and annual reports of local government, government agencies and the Namoi CMA which jointly report on progress towards achieving the CAP targets by all NRM stakeholders in the catchment.

**Intent:** If the CAP objectives are to be realised, it is necessary to provide a focus not only on rural industries, but also on the numerous other industries, collectively termed urban, industrial and infrastructure, that impact on the resource base. Under the EP&A Act, land use planning consent rests with Local Govt. for, for major developments, with State Govt. Incorporating CAP objectives into Local and State Govt planning will be a significant step in achieving integrated NRM Planning. It will also greatly enhance the potential to achieve the NRM objectives outlined in this CAP by providing a framework for natural resources to be considered in all regulated developments.

New planning regulations, including the introduction of a Standard LEP, and the redefinition of virtually all Local government boundaries following a major restructure in 2004, means that all Local Councils in the catchment will produce a new LEP in the next few years. This planning phase, particularly the development of rural and regional strategies, provides a significant opportunity to align CAP objectives into Planning Instruments, which subsequently provide a platform for sustainable urban development.

The CMA considers it is achievable to have four of the seven local councils in the catchment who will substantially align their plans with the CAP.

**The key positions responsible** for achieving this target within the Namoi CMA are:

- Catchment Officer - Local Government
- Program Manager – Strategy and Planning

**Potential collaborators** to assist in achieving this target include:

- Local Councils, LGSA, non-agricultural / manufacturing industries, State Agencies, developers. Additional collaborators will be identified during project development.

**Monitoring and Evaluation:** This target will be evaluated against the extent that the Strategies informing LEPs are consistent with CAP objectives and translated in management plans and the introduction of catchment wide reporting through SoE Reports.

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**How Can the Namoi Community Make This Happen?**

*(Possible Activities for inclusion in Investment Strategies and Annual Implementation Plans)*

**CMA Role**

**Benchmarking, Monitoring and Evaluation**

- **L** Determine Performance Indicators to assess the extent of consistency between new Local Government (LG) Strategies and other planning instruments with CAP objectives and targets.
- **P** Produce combined Catchment-wide State of Environment Reports covering the activities of Local Government, CMA and other NRM organisations reporting on progress towards CAP objectives.

**Knowledge and Data**

- **P** Collaborate on data collection and usage, and establish protocols for sharing information between agencies, local government and the CMA.

**Awareness, Skills and Engagement**

- **L** Engage the community in environmental planning for all instruments and plans at all levels.
- **P** Lobby to achieve an independently managed Environmental Impact Statement (EIS) / Review of Environmental Factors (REF) process for significant developments eg. mining.

**Planning**

- **L** Appoint a CMA Local Government liaison officer.
- **P** Liaison activities to include collaboration between LG planners and CMA re inclusion of Catchment Management objectives ie. CAP Targets, in Rural and Regional Strategies, Standard LEPs and other Local Govt planning instruments and processes. eg. identification and preservation of vegetation corridors, protection of riparian zones, water ecosystems, high value agricultural and environmental and cultural heritage assets, and adoption of the Soil and Land Capability Index.
- **P** Encourage integration and consistency with the Namoi CAP, of all regional planning activities and outcomes under the EP&A Act, including Regional Environmental Plans (REPs), State Environmental Planning Policies (SEPPs) and State Significant Developments, as well as those under LG consent.
- **P** Namoi Regional Organisation of Councils (NROC), which includes representatives of all Local Governments in the Namoi Catchment and the Namoi CMA, to act as a forum / provide strategic direction on regional environmental issues, possible partnerships with Local Government etc.
- **P** Maintain the Namoi Local Government Group (NLGG) and establish “professional officer” groups within the NLGG covering NRM Issues eg. land-use planning, water, native vegetation to implement the directions provided by the NLGG and NROC.
- **P** Investigate the benefits of integrating rural floodplain planning into regional planning.

**Implementation and Incentives**

- **P** Provide incentives to improve urban, peri-urban and industrial water management including efficient water use eg. Implement Integrated Water Recycling Management Plans, promote recycling of water, including greywater, rain water tanks, metering on consumption. Minimising impacts on water quality eg. Minimise pollution discharge (above DEC license conditions).
- **P** Support and encourage adoption of best practice in local government and industry activities eg. reduced chemical usage, efficient water use, sediment control, minimisation of pollution discharge
- **P** Implement environmentally sustainable urban development, including residential, rural residential / peri-urban, industrial and commercial, including fully implementing BASIX, guidelines for Rural Subdivisions, applying buffers between high value environmental assets and development etc.
4. Surface and Ground Water Ecosystems

Surface and Ground Water Ecosystems consist of surface and ground water quality, including salinity, wetlands, floodplains, and the riverine zone made up of stream bed and banks, riparian vegetation and aquatic biota. It also covers access to water, including the environmental water required to maintain surface and groundwater dependant ecosystems, social values of water including Indigenous and European cultural values, recreation and aesthetics, and the beneficial uses that people gain from water, including agricultural and industrial production, and drinking water.

A Riverine Condition Assessment of the Namoi Catchment was undertaken in 2001, based on five key indicators:

- water quality - as measured by electrical conductivity, turbidity, total phosphorus and pesticides;
- hydrological stress - a measure of the level of extraction and/or regulation of streamflow;
- physical stability - reflecting the extent of streambank and gully erosion;
- riparian vegetation - the extent and condition of the riparian vegetation; and
- aquatic biota – the diversity of plants and aquatic animals in the stream.

These indicators are interconnected; streambank and gully erosion are significant contributors to deteriorating water quality and can accelerate the loss of riparian and instream vegetation. Aquatic biodiversity is a reflection of the water quality and habitat conditions influenced by riparian vegetation.

Data from the Riverine Assessment Report and more recent Namoi Water Quality Monitoring Reports illustrate that water quality in the Namoi River is variable and often does not meet ANZECC guidelines. Sources of nutrients, particularly phosphorus and nitrogen, come from non-point sources include sewage treatment works, leakage from septic tanks, farm effluent, runoff from agricultural land, industrial effluent and urban storm water runoff. They also come from sediment from streambank erosion. Total phosphorus concentrations are high right across the Namoi Catchment. Turbidity levels from suspended sediments are highest in the mid catchment in areas associated with cropping areas. Blue-green algae outbreaks, partly caused by high levels of phosphorus, are common during the summer months.

A number of major tributaries of the Namoi have inherently high salinity levels, including Goonoo Goonoo, Mooki, Upper Manilla, Quirindi and Werris Creeks. Bomera Creek, in the Upper Coxs subcatchment, historically has the highest salinity levels, whilst the Macdonald River at Bendemeer is the only site where readings are routinely below the ANZECC trigger value. In some locations aquifer contamination from the drawdown of salty water from near-surface saline aquifers is a threat. There is very limited monitoring of groundwater quality, so the extent of the problem is unknown.

The detection of pesticides (including insecticides, herbicides and defoliants) in surface water is of great concern to water managers and the community. The effects of long term, low dose exposure to pesticides on humans and the environment are largely unknown. Spray drift, vapour transport and runoff from agriculture, particularly cropping, are the main pathways for pesticide transport into river systems. Pesticide levels in the Namoi River have declined markedly in the last decade due to improved management, particularly in the irrigation industry.

The condition of the native vegetation in the riparian zone is considered to be one of the key indicators of stream health. Remnant vegetation contained within the riparian zone provides vegetation corridors, food, shelter and breeding habitat for aquatic organisms, a buffer/filter strip between land use and watercourses for nutrients, sediments and other contaminants, streambank stabilisation and cultural, spiritual and aesthetic values for all people.

Low levels of remaining native vegetation have resulted in unstable stream banks and bed lowering, especially in the middle and lower catchment. On average, there is only 30% tree cover within the riparian zone across the catchment. The worst cover occurs in the Goonoo Goonoo subcatchment, typical of the mid catchment. Low levels of vegetation result in minimal shade and protection to provide good habitat conditions. It also results in sedimentation and nutrients in surface water that threaten aquatic biota. There is inadequate data to provide an accurate assessment of aquatic biota.

Hydrological stress is a reflection of extraction and the degree of regulation. Over extraction is an issue in a number of subcatchments. Surface and ground water systems are over-allocated, and governments have been slow to make the difficult, but necessary, decisions to ensure long term access and sustainability. Poor water quality, thermal pollution and oxygen depleted water from dam releases, along with in-stream barriers, are threats to aquatic biota. Unlicensed development on floodplains in previous decades has resulted in community conflict which still requires resolution in some locations. Additionally, some infrastructure requires modification to protect wetland function.

Technical guidelines and manuals are available for Riverine Ecosystem Management, including Cotton BMPs, Riparian Technical Manuals, Floodplain Development and Wetland Management manuals, and Policy on Fish Habitat Rehabilitation. However, there is still much work to be before these guidelines adopted, and riverine environments protected or rehabilitated.
The Water Allocation Decision Support System (WADSS) developed for the Namoi Valley by Dr Letcher of Australian National University and the Integrated Quantity and Quality Model (IQQM) may be useful in enabling the CMA to assist and support its community of water users in beneficially sharing the water resources of the Catchment. The Namoi CMA also has a number of projects currently underway in the Catchment eg. The Namoi Wetlands Study, which will provide valuable information to direct and support future investment in Surface and Ground Water Ecosystems.

The Management Targets formulated to address the issues facing the Catchment and its water resource, and improve water quality and access will require the Namoi CMA to establish collaborative partnerships with water users of all categories, particularly Local Government, irrigators and industrial users and Water User groups, industry organisations, and State agencies, especially DNR and State Water, environmental groups as well as research organisations eg Cotton Catchment Communities CRC and CRC for Irrigation Futures, MDBC and other policy makers, and the National Water Initiative.
CTW – From 2006, there is an improvement in the condition of surface and ground water ecosystems.

Intent: The productive base of the Namoi Catchment is strongly dependant on water. Limited access to water for towns, industry and agriculture is potentially a major limitation to regional growth. If we are to achieve the vision of being a viable and sustainable region, then fair and reasonable access to water by all users including the environment is essential. The intent of these targets is to maintain or improve water quality and provide access for all people, while maintaining the productive uses that provide significant wealth for the region. This will be achieved through improving the way land and industries are managed, in order to minimize point source and diffuse source pollution from sediment, nutrients and pesticides. Additional measures to improve the state of the water ecosystems include revegetation, riverine rehabilitation, river flow management and water sharing plans. Improvements in water use efficiency are sought from all water users.

The Water Management Amendment Act 2005 provides for the CMAs to be involved in developing future Water Management Plans (WMPs) and in evaluating the outcomes of existing water sharing plans (WSPs). The operational aspects of this role have been defined in the CMA Role in Water Management Agreement with the Minister for Natural Resources and Primary Industry. CMAs have the capacity to more fully integrate some water management issues such as water quality into the catchment activities and targets addressed through the CAP. These amendments to the Water Management Act 2000 enable CMAs to acquire and manage adaptive environmental water via water access licences and through the establishment of Environmental Water Trust Funds if approved by the Minister for Natural Resources. Adaptive Environmental Water could assist in achieving outcomes for water quality and aquatic threatened species, populations and communities. However, at the start of 2006, there is no Adaptive Environmental Water to prompt the establishment of a Trust Fund in the Namoi. Regulatory WMPs, which involve the definition of basic statutory rights, such as water sharing, floodplain management or water use, are stand-alone regulatory plans under the Water Management Act 2000, administered by Department of Natural Resources. The Water Management Planning Target under this theme supports the objectives of the State Water Management Outcomes Plan, which outlines the objectives of the Water Management Act 2000, as well as supporting the National Water Initiative.

Improvement in surface and ground water ecosystems requires a landscape level approach. The adoption of Best Management Practice (BMP), which encompasses all aspects of natural resource management, by all industries, is the key to improving water quality and the condition of the ecosystem. BMP, both in the riverine zone and the surrounding catchment area, should result in an improvement to groundcover, which will slow water movement, reduce flood-flow velocity and subsequent erosion and instream degradation. The condition of the riparian zone and the overall water balance should improve, helping reduce sedimentation and nutrient levels, and improving the conditions for aquatic plants and animals.

The major Impacts on the Resource and Risk to Catchment Health analysed in the Initial Environmental Review and reported in the Resource Summary tables are as follows and will be addressed in the four Management Targets that underpin this Catchment Target:

- pollution of both surface and ground water by pesticides and chemicals (MTW2)
- sedimentation from overgrazing, erosion and bank slumping (MTW1)
- salinisation from surface wash-off, or leaching of salts into groundwater due to excess deep drainage and recharge (MTW2)
- degraded aquatic habitat from vegetation removal and poor water quality (MTW3)
- degradation of riparian zone vegetation from weeds and overgrazing (MTW1)
- reduced river waters and redirection of overland flows from water harvesting and extraction (MTW4)
- aquifer interference from over extraction and potentially from mining (MTW4).

Performance in achieving this catchment target will be measured by the Riverine Condition Assessment Index and a Groundwater Index (yet to be developed).

The table below illustrates how the Targets in the Namoi Catchment Action Plan address the State-wide Targets, National Matters for Targets and Joint Steering Committee Investor Preferences.

* State and National Marine and Estuarine Targets are not applicable to inland catchments such as the Namoi.
<table>
<thead>
<tr>
<th>NRC State-wide Targets *</th>
<th>National Matters *</th>
<th>JSC Investor Preferences or CMA Act 2003</th>
<th>CMA Management Targets</th>
<th>CMA Management Actions</th>
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<tbody>
<tr>
<td><strong>Water</strong></td>
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<tr>
<td>5. Improve the condition of riverine ecosystems</td>
<td>Inland aquatic ecosystem integrity (rivers and wetlands)</td>
<td>Protect and manage places and values of state and national environmental significance. Identify and maintain aquatic ecosystems of high value. Identify wetlands, and manage threats to prevent degradation</td>
<td>MTW1 – From 2006, there will be an improvement in riverine structural stability, and the condition and extent of native riverine vegetation in priority riverine areas</td>
<td>a) implementing BMP in the riverine zone, including improved grazing management and provision of alternative watering points; b) revegetation using native species, and weed control in strategic areas; c) structural rehabilitation works.</td>
</tr>
<tr>
<td>8. Improvement in the condition of important wetlands, and the extent of those wetlands is maintained</td>
<td>Nutrients in aquatic environments Turbidity in aquatic environments Surface water salinity in freshwater aquatic environments</td>
<td>Contribute to the application of the National Water Quality Management Strategy; planning, management and monitoring frameworks in particular catchments. Identify targets and improve surface and ground water quality, biological diversity, and environmental condition of rivers and wetlands.</td>
<td>MTW2 – From 2006, maintain or improve surface and ground water quality suitable for irrigation, raw drinking water and aquatic ecosystem protection at Goangra Gunnedah, Narrabri; Target values are as determined by: a) ANZECC Guidelines 2000: Irrigation Water - EC range of 650 – 1300μS/cm; and Aquatic Ecosystem Protection - mean values of Total Endosulphan &lt; 0.03 μS/Litre and Atrazine &lt; 0.7 μS/Litre. b) MDBC: River Salinity of 550 μS/cm 50% of the time, and &lt;1000 μS/cm 80% of the time at Goangra.</td>
<td>a) rehabilitating riverine ecosystems; b) minimising pollution from point sources discharges such as industry; c) minimising diffuse source pollution by better land management; d) protecting groundwater from contamination by salts and pesticides; e) improving river flow.</td>
</tr>
<tr>
<td>6. Improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses</td>
<td>Biodiversity Certification under the Fisheries Management Act 1994</td>
<td>MTW3 – From 2006, protect and assist the recovery of threatened or priority native aquatic species in identified priority areas. (This includes groundwater dependent ecosystems.)</td>
<td>MTW4 - From 2006, oversee and review water management plans and processes under the Water Management Act 2000, so that Water Management Plans, including Water Sharing Plans (WSPs), result in fair and reasonable access to surface and ground water sources for the environment (water dependant ecosystems), economic uses (agricultural, industrial, town water supply) and social values (recreation, cultural).</td>
<td>a) water sharing plans; b) consultative processes; c) adaptive environmental water management; d) major infrastructure upgrades; e) dam operations; f) floodplain management &amp; planning</td>
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</table>

Note: All JSC Investor Preferences are covered to Management Target level within the CAP. JSC Investor Preferences for CMA Actions will be addressed in the Three-Year Rolling Investment Strategies.
### Riverine Ecosystems

**MTW 1 – From 2006, there will be an improvement in riverine structural stability, and the condition and extent of native riverine vegetation in priority riverine areas.**

This will be achieved by the following management actions:
- a) implementing BMP in the riverine zone, including improved grazing management and provision of alternative watering points;
- b) revegetating strategic areas using native species, and weed control; and
- c) rehabilitating strategic degraded reaches using structural works.

**Intent:** The intent is to improve the condition of strategically important riverine environments in priority areas, in order to maintain and extend high quality reaches. This target has a strong focus on improving and maintaining water quality and suitable habitat for aquatic plants and animals. The riverine area includes the zone along rivers and creeks, and around billabongs, wetlands and floodplains. Initial prioritisation of strategic locations has been identified through the Namoi Riverstyles® Report.

Additional vegetation is best established in strategic areas where it will protect riverine values downstream and link existing riverine or remnant vegetation. High quality native vegetation is important for both riparian values and biodiversity; however, its conservation and management is included in the Native Vegetation Target (MTB1).

Weeds in the riparian zone have the potential to impact down the length of the catchment, including degrading floodplains and wetlands, and threatening High Value Conservation riverine vegetation. Early control in the upper catchment is the most cost effective way of dealing with this problem.

Structural works at strategic locations prevent degraded reaches from affecting stream stability and biodiversity in good condition, as well as improving water quality. Engineering works will be consistent with the *Fisheries Management Act, 1994* and the *Water Management Act, 2000.*

**The key positions responsible** for achieving this target within the Namoi CMA are:

Technical Officers – Riparian, with support from DPI Fisheries Conservation staff

**Potential collaborators** to assist in achieving this target include:

Landholders, rural industry groups, community and environmental groups, research organisations eg LWA, State agencies. Additional collaborators will be identified during project development.

**Benchmarking, Monitoring and Evaluation**

New information will be used to revise the 2001 Riverine Assessment Index as an indicator and a new benchmark established for the start of the CAP. Additional survey work will be required during the life of the CAP to assess progress.

<table>
<thead>
<tr>
<th>What Do We Want to Achieve?</th>
<th>How Can the Namoi Community Make This Happen?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Management Targets – Water Ecosystems (MTW))</td>
<td>(Possible Activities for inclusion in Investment Strategies and Annual Implementation Plans)</td>
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</table>

**Benchmarking, Monitoring and Evaluation**

- Revise the Riverine Assessment Index as the Performance Indicator in light of new datasets including Riverstyles® report, Wetlands report, fish monitoring and other aquatic biodiversity information, and include river salinity and water quality, and make it applicable across the catchment by end 2006.
- Determine current benchmark using both 2001 and new Performance Indicators and compare for change over last five years.
- Establish quantitative targets for improvement of riverine ecosystems, based on new Performance Indicators.
- Every five years, evaluate agency monitoring outputs and have additional survey work undertaken where essential to assess progress towards target.

**Knowledge and Data**

- Map river reaches to identify revegetation and rehabilitation sites, as necessary for benchmarking and prioritisation.
- Investigate or review innovative / cost effective rehabilitation techniques.

**Planning**

- Review priority locations for strategic revegetation and rehabilitation works.
- Prioritise wetlands for rehabilitation, drawing on listed significant wetlands and the CMA report on the extent and condition of wetlands in the catchment once finalised.

**Awareness, Skills and Engagement**

- Educate people about the importance of riverine ecosystems, their management and the regulatory framework relating to rivers.
- Demonstrate high condition riverine ecosystems and educate people on the value of targeting high value areas rather than investing in highly degraded locations.
- Conduct extension programs in priority areas promoting riverine BMP, including improved land management, reduced pesticide and fertiliser use, revegetation, appropriate erosion control works, and buffer zones from cropping and residential areas.

**Implementation and Incentives**

- Provide technical support to help implement riparian management.
- Provide incentives to undertake riverine restoration, including rehabilitation projects, enhancing riparian vegetation using provenant species and implementing BMP, on public and private land.
- Modify and repair in-stream structures in strategic locations where they threaten the condition of high quality reaches.
- Manage weeds in riparian areas, including willows, initially focussing on upstream areas, and where weeds threaten riverine ecosystem values.
What Do We Want to Achieve?
(Management Targets – Water Ecosystems (MTW))

Surface and Ground Water Quality, including River Salinity

MTW2 – From 2006, maintain or improve surface and ground water quality suitable for irrigation, raw drinking water and aquatic ecosystem protection at Gunnedah, Narrabri and Goangra; Target values are as determined by:

- a) Australian & New Zealand Environmental Conservation Council Guidelines 2000, for Irrigation Water - Electrical conductivity range of 650 – 1300µS/cm; and Aquatic Ecosystem Protection - mean values of Total Endosulphan < 0.03 µS/Litre and Atrazine < 0.7 µS/Litre.
- b) MDGC; River Salinity of 550 µS/cm 50% of the time and < 1000 µS/cm 80% of the time at Goangra (at time of writing the CAP).

This will be achieved by the following management actions:

- a) rehabilitating the riverine ecosystem;
- b) minimising pollution from point sources discharges such as industry;
- c) minimising diffuse source pollution by better land management practices;
- d) protecting groundwater from contamination by salts and pesticides through managing extractions, leaching and bore head contamination; and
- e) improving river flow and availability of adaptive environmental water.

Intent: Water quality is an indicator of general catchment health and is fundamental to groundwater and river processes that sustain aquatic plants and animals, GDEs, riparian vegetation and wetlands. Water quality impacts on the way in which communities use the water for activities eg agriculture, industry, recreation and town water supplies. This target will serve as a long term indicator of the effectiveness of actions for other Management Targets. The intent of this Target is to put in place the necessary monitoring procedures to ensure that all water users, including the environment, have access to ground or surface water of sufficient quality to maintain existing beneficial uses. This will also provide a long term measure of the effectiveness of activities intended to reduce the impact of all types of salinity on the landscape. River salinity targets will be reviewed once the 2005 MDGC Salinity Audit has been finalised.

The key positions responsible for achieving this target within the Namoi CMA are:
- Monitoring and Evaluation Staff;
- Technical Officers - Riparian

Potential collaborators to assist in achieving this target include:
- State agencies, particularly DNR and DEC, Local Government, MDGC. Additional collaborators will be identified during project development.

Benchmarking, Monitoring and Evaluation: Existing DNR data will be used to establish benchmarks and determine additional key sites in the tributaries. Monitoring and Evaluation Officers will manage the review of data collected by the agencies to assess progress.

How Can the Namoi Community Make This Happen?
(Possible Activities for inclusion in Investment Strategies and Annual Implementation Plans)

Benchmarking, Monitoring and Evaluation

- Establish benchmarks of water quality, including salinity and aquatic biodiversity, for subcatchments or groundwater management zones, using existing data where possible or with additional monitoring.
- Determine the key site locations and water quality parameters for setting targets for surface water.
- Align salinity targets with NSW and MDGC salinity targets and validate against recognised salinity models once available.
- Identify areas where groundwater is at risk from contamination and select key sites and parameters for targets, including consideration of Groundwater Dependant Ecosystems (GDEs).
- Determine Performance Indicators and develop quantitative targets for improvement – Evaluate the Sustainable Rivers Audit as a performance measure.
- Maintain or establish ongoing monitoring at the key sites, on agreed monitoring frequency.

Knowledge and Data

- Improve knowledge on the age of groundwater, its movement within the landscape and substrate, as well as the source of salts or other contaminants in groundwater, and associated risk of contamination of fresh water sources.
- Evaluate market based instruments eg. pollution credits which could assist in improving management for water quality objectives.

Planning

- Manage groundwater extraction in line with Ecological Sustainable Yield, and prevent salinity targets will be reviewed once the 2005 MDBC Salinity Audit has been finalised.
- Influence policy e.g. dam operations, to improve flow management, including flushing flows for salinity and algal management, reduce transmission water losses, and reduce thermal pollution.

Awareness, Skills and Engagement

- Use extension and education programs to improve land management (MTP2), including riparian zone management, and chemical usage, both on land and around bore heads.
- Provide education and awareness programs and discussion forums to highlight the value of the water resource and the maintenance of good quality.

Implementation and Incentives

- Provide incentives and technical support for BMP activities which minimise or manage water pollution, including strategically targeted river works (MTW1) and interception schemes for saline base-flow from gullies and other salinity point sources (MTL1), targeted to areas that will impact on key sites / are in line with priority investment locations.
- Extend ‘area wide management’ beyond cotton irrigation areas to reduce “off-target” pesticide pollution.
- Improve water quality of point source discharges eg. effluent reuse schemes, waste water disposal, and management of septic systems (See MTL3).
- Review and upgrade conditions on licenses under the Protection of Environment Operations Act on a regular basis / in keeping with BMP.

CMA Role

P = Potential
S = Strategic
### What Do We Want to Achieve?

#### Management Targets – Water Ecosystems (MTW)

**Aquatic Plants and Animals**

MTW3 – From 2006, protect and assist the recovery of threatened or priority native aquatic species in identified priority areas.

This will be achieved by the following management actions:

- **a)** improving knowledge;
- **b)** protecting threatened species and promoting recovery through Threat Abatement and Recovery Plans and Priorities Action Statements;
- **c)** implementing aquatic habitat rehabilitation projects; and
- **d)** improving fish populations through restocking and control of pest species.

**Intent:** The intent of this target is to improve the condition of aquatic ecosystems and associated plants and animals, through aquatic habitat rehabilitation projects focused on threatened and vulnerable species, populations, communities and ecosystem functions. The implementation of these objectives should address Biodiversity Certification conferred by the Minister for Primary Industries under Part 7 of the Fisheries Management Act 1994.

While aquatic plants and animals are dependant on satisfactory water quality and riverine conditions, this target is specific to improving the status of threatened or vulnerable aquatic species; similar to MTB2 for terrestrial species. It specifically focuses on aquatic species that spend part or all of their lifecycle within the Namoi catchment.

This target focuses on reducing threatening processes to native aquatic biodiversity such as instream structures and the control of pest species. It also focuses on providing habitat protection and rehabilitation including the enhancement of large woody debris.

**The key positions responsible** for achieving this target within the Namoi CMA are:

- Biodiversity Officer - Dept of Environment and Conservation (DEC) secondee
- Technical Officers - Riparian, with support from DPI Fisheries Conservation Mgr

**Potential collaborators** to assist in achieving this target include:

- State agencies, particularly DEC and DPI (Fisheries), environmental and community groups, Research organisations eg CRC Freshwater Ecosystems, LWA. Additional collaborators will be identified during project development.

**Benchmarking, Monitoring and Evaluation**

Performance Indicators will not be determined until the results of some current investigations are available. Monitoring may include direct measurement of fish stock and other priority aquatic species. Indirect measurement using water quality related to thresholds for components of the aquatic ecosystem will be included in water quality monitoring.

### How Can the Namoi Community Make This Happen?

**Benchmarking, Monitoring and Evaluation**

- Establish interim water quality thresholds for the Namoi as defined under the ANZECC guidelines for aquatic ecosystems, until improved knowledge is available.
- Establish benchmarks for aquatic biodiversity.
- Determine Performance Indicators for aquatic biodiversity relevant to inland catchments and rivers and develop quantitative targets for continual improvement.
- Undertake regular monitoring of aquatic biodiversity in line with Performance Indicators.
- Assess the extent of improvement every five years through data analysis and repeat surveys.

**Knowledge and Data**

- Investigate the habitats of threatened aquatic species and priority populations, the threats and flow distribution requirements, habitat dependency etc, and improve knowledge of aquatic ecosystem function.
- Establish Biodiversity Water Quality Thresholds for threatened aquatic plants and animals in the Namoi.
- Investigate Groundwater Dependent Ecosystems (GDEs) in the Namoi, their significance and need for protection, and their relationship with groundwater quality.

**Planning**

- Prioritise species and locations for investment (drawing on the current Namoi Weir Survey and Assessment Report and other data currently held / being collected by DPI, including Priority Action Statements.)

**Awareness, Skills and Engagement**

- Initiate education and awareness programs informing community about aquatic biodiversity, their value and their habitat, eg. value of instream woody debris, the impact of pest species such as carp, and overfishing.
- Select priority species, including aboriginal “totem” species, as a means of promoting aquatic biodiversity through ready identification.

**Implementation and Incentives**

- Implement programs for the improvement of aquatic biodiversity.
- Remove or modify barriers to fish passage according to priorities determined in the Weirs Report.
- Provide incentives for aquatic habitat protection and rehabilitation programs, particularly for threatened species.
- Protect threatened native fish species through Threat Abatement & Recovery Plans, and implementing Priorities Action Statements.
- Control pest (alien) Species, e.g. implement carp separation cages at existing fish-ways where feasible.
- Manage fish translocation and stocking, including investigating a native fish hatchery.
## Water Management Plans

**MTW4 - From 2006, oversee and review water management planning and other processes under the Water Management Act 2000, so that Water Management Plans, including Water Sharing Plans (WSPs), result in fair and reasonable access to surface and ground water sources for the environment (water dependant ecosystems), economic uses (agricultural, industrial, town water supply) and social values (recreation, cultural).**

This will be achieved though:

- a) water sharing plans;
- b) consultative processes;
- c) adaptive environmental water management;
- d) major infrastructure upgrades;
- e) operations of major dams eg. management of water quality impacts, including pollution from cold water; and
- f) floodplain management and planning.

**Intent:** The intent of this target is to achieve ecologically sustainable yield (ESY) for groundwater sources and river flow objectives identified by community and government to protect and enhance environmental, productive, cultural and social values of surface and ground water in the Namoi Catchment. This management target provides a review and evaluation process for the water sharing plans and other water management plans (eg. floodplain plans), in place or currently being developed. Implicit in the target is:

- Equitable sharing and access between all users, including the Indigenous community
- Use of the productive share of the resource in areas of best return
- Maintenance of water quality objectives (largely overlooked in current WSPs)
- Floodplain planning to maintain ecological values and surface water flows, while providing infrastructure for productive use and transfer of water
- Compliance with MDB and Darling River Caps on surface water harvesting
- Consistency with other objectives of State Water Management Outcomes Plan and any management plans under the Water Management Act 2000 and Water Management Amendment Act 2005.

**The key positions responsible** for achieving this target within the Namoi CMA are:

- Chairman / General Manager / Strategic Planning Manager
- Monitoring and Evaluation Coordinator

**Potential collaborators** to assist in achieving this target include: DNR as the State agency responsible for developing and implementing WMP, DPI & DEC, environmental groups, Research organisations, State Water as infrastructure operators.

### Benchmarking, Monitoring and Evaluation

- Adequate and appropriate monitoring to be undertaken to enable review and evaluation of implementation of WSPs in relation to the objectives and targets adopted within the plans.
- Establish minimum quantitative targets for environmental water based on the conditions encompassed in Water Sharing Plans.
- Review and evaluate WSPs and other water management plans and policies and their implementation, and their consistency with legislation and regulation eg. MDBC Cap, graziers’ rights.
- Review the implementation of floodplain plans, including compliance with the plan, to ensure that environmental objectives as defined in the NSW Government Floodplain Development Manual 2005 (eg. floodplain ecosystem health, soil erosion, biodiversity outcomes) are being met.
- Provide advice to the Minister on the effectiveness of implementation of Water Management Plans.

### Planning

- CMA to take an active role in Water Management as defined by the Minister in the document “CMA Roles in Water Management”.
- Ensure that social, economic and environmental considerations are dealt with equally during water management planning.
- Include comprehensive water quality objectives in future or revised WSPs.
- Review regional DNR procedures for changes to annual allocations and other local decision making processes in relation.
- Review floodplain planning processes, including the scale of planning, with a view to reducing the length of time to write plans, and improve satisfaction in the consultative process and outcomes.

### Awareness, Skills and Engagement

- Identify key stakeholders and establish a Water Reference Panel to provide a conduit of information from stakeholders to the Namoi CMA about the water industry and related issues.
- Employ or contract expertise to undertake consultation on water planning and activities in the Namoi, including WSPs, and provide balanced advice to the Minister.
- Facilitate opportunities for education and discussion about water reforms and contentious issues.

### Implementation and Incentives

- Seek to increase the amount of environmental water to a quantity determined to be necessary for environmental purposes in the Namoi through Water Sharing Plans and infrastructure upgrades.
- If Adaptive Environmental Water becomes available, establish an Environmental Water Trust Fund, and investigate trading of environmental water.
- Support the implementation of the National Water Initiative, and where possible access funds from the Australian Water Fund to improve water management, water use efficiency and water infrastructure.
- Revise Environmental Management Plans relating to the management of major dams and other river structures to achieve NSW Government River Flow and Water Quality Objectives, and support the Namoi CAP Targets, including the protection of aquatic biodiversity, and minimising the environmental impact on the riverine system.
5. Native Plants and Animals

This theme covers land based (terrestrial) native vegetation and animals, including Threatened Species, Populations and Communities (flora, fauna and other life forms) listed under Threatened Species legislation; and invasive plants and animals, which are a significant threat to our local native plants and animals. Native vegetation is the cornerstone of the natural terrestrial ecosystem, and is often used as a surrogate indicator for the overall health of terrestrial biodiversity.

This theme does not encompass all biodiversity as defined by “the variety of all life forms: different plants…, animals…, the genes they contain and the ecosystems in which they live” (DEC 2006). The NSW and Australian Governments have limited their Matters of Significance and Investment Preferences to issues relating to native vegetation and fauna (see Table next page), and the Namoi CMA has prioritised its targets to the aspects described above. Some of the broader issues relating to non-native ecosystems are addressed in the Landscape Targets through delivery of Best Management Practice. Aquatic biodiversity issues have been addressed under Surface and Ground Water Ecosystems.

Healthy ecosystems contain a diverse range of plants and animals. The loss or degradation of these ecosystems is a major cause in the decline in diversity and condition of our native plant and animal communities. This is strongly linked with other environmental problems, such as poor land use practices, invasive species and loss or fragmentation of habitat, caused by the impacts from agricultural, mining, urbanisation and infrastructure activities.

Climate change is potentially also a major threat to biodiversity. Many of the native plant and animal species, especially those near the edge of their range, may not survive given the predicted increase in temperatures and changed rainfall patterns. If worst case predictions are realised, the effects of climate change could have a devastating impact on local biodiversity, agricultural production and the socio-economic health of the catchment. Regional linkages of habitat are required to allow species to be able to move / migrate if they are going to adapt to such changes.

The Native Vegetation Act 2003 (NVA) was introduced with a clear objective to prevent further broad-scale clearing. Broad-scale clearing will only be permitted where it can be demonstrated to maintain, or result in improved, environmental outcomes under this legislation. Clearing applications are assessed using the Property Vegetation Plan (PVP) Developer - a computer based system for assessing management options. It can also be used to assess the value of project proposals for incentive funding. The Namoi CMA will be looking to provide specific information at a local and subcatchment scale for inclusion in the PVP Developer which will ensure decisions are based on the best available information. This would include knowledge on Regionally Significant Vegetation (RSV), which could consist of areas of known High Conservation Value (HCV), habitat known to support threatened or priority species and populations, salinity recharge areas, areas of extreme erosion hazard, regionally important corridors or significant riparian vegetation. RSV will be further defined and identified as an action in the CAP.

At the time of writing the Namoi Blueprint in 2002, the extent of native vegetation, including native grasslands, was estimated at 62% of the Namoi Catchment, compared to the average of 42% across the Eastern and Central Divisions of NSW. The Bureau of Resource Science Vegetation Cover (2003) provides a map and statistics for the Namoi Catchment which estimates that there is a total of 80.3% of native vegetation left in the catchment. The figures in the Namoi Catchment are higher due to the extensive tracts of public land in the Brigalow Belt South bioregion ie. the Pilliga Forests and large areas of native pastures used for grazing. However, there is significant variation in the extent of remaining native vegetation across the catchment.

There is very limited native vegetation represented in reserves ie. National Parks or Conservation Reserves, except for the Brigalow Bioregion, where the conservation status has been improved significantly with the introduction of the Brigalow and Nandewar Community Conservation Area Act 2005, which saw the conversion of almost 360,000 ha of state forests and other publicly owned land transferred to Community Conservation Areas IN December, 2005. In the three other Interim Biogeographical Regionalisation of Australia (IBRA) regions which occur in the Namoi Catchment, there is <2.5 % reserved for conservation in the Nandewar, <10% in the New England and <1% in the Darling Riverine Plains. This provides a significant opportunity for investment to improve the conservation status of Ecologically Endangered Communities and Threatened Species in these Bioregions in the Namoi Catchment.

While much of the grazing land, particularly in the western plains and on the tablelands is still classed as native grasslands, it has been at least partially cleared of the over-storey. In many places it has been significantly over-cleared relative to land capability, and often only one component – either the over-storey or the grasses remain. The fertile black soils and grey clays of the plains retain only small native vegetation remnants. The condition of much of the vegetation in the Namoi Catchment is largely unknown, as it has not been mapped.
Threatened Species, Populations and Communities are those listed under the NSW Threatened Species Conservation Act 1995, the NSW Fisheries Management Act 1994, and the Federal Environment Protection and Biodiversity Conservation Act 1999. The decline in native species is clearly evident, with 113 Threatened Species, two Endangered Populations and twelve Endangered Ecological Communities currently listed as occurring in the Namoi Catchment. The most significant causes of this decline has been due to land clearing, invasive plants and animals, or degradation of habitats i.e. native vegetation communities. The introduction of the Native Vegetation Act 2003 is aimed at preventing broad-scale clearing and hence reduces the threat to native species.

Funding sources for the protection and recovery of Threatened Species is very limited under current government funding allocations to the Namoi CMA. Until alternative funding sources can be found, these issues will have to be addressed through investment in the conservation and enhancement of native vegetation, and other programs where multiple Management Targets outcomes, including Threatened Species, can be achieved.

It is proposed that “Priority Species” be used as a means of engaging community support in the effort to improve the status of Threatened Species. Priority Species is being used as a term to collectively describe Threatened Species, any other species identified under the Priorities Action Statements which will be developed by DEC and DPI, as well as locally important species and groups of species, which have similar requirements and threatening processes as a group of Threatened Species. This could also include totem species recognised by the Aboriginal community. The benefits of including locally important species is that they are more easily observed and recognised, and consequently are more likely to engender a positive response from the community, including commercial enterprises getting behind the program through ecotourism. Partnerships will be actively sought with other organisations and agencies with an interest in conservation of Threatened Species.

Invasive plants and animals include weeds and feral pests. They can be exotics or natives, aquatic or terrestrial flora and fauna. They are not limited to listed noxious weeds and pest animals under legislation. Invasive weeds and feral animals are not only one of the most significant threats to native biodiversity, but they also place huge economic costs on land managers. Preventing establishment, and controlling their spread, will reduce the threat to biodiversity, while simultaneously providing benefits to agricultural industries. Improving collaboration between the organisations responsible for managing weeds and pests is essential if this objective is to be achieved.

Activities will be focused on habitats that are cost effective to recover i.e. areas of habitat that are in a reasonable, but not ideal, condition or in areas of regionally significant vegetation that can be enhanced to achieve a healthy ecosystem through an improvement in condition or extent. Investment into rehabilitating highly degraded landscapes, which is costly and unlikely to provide long term biodiversity benefits, will be limited unless it provides substantial benefits to other targets.

Collaboration from both public and private land managers will be needed to achieve the targets for native plants and animals. A significant portion of the remaining native vegetation is held in public ownership including Crown land, State Forest, National Parks, Nature Reserves and Community Conservation Areas, and managers of these public lands will be encouraged to partner the Namoi CMA to implement management practices that will assist in meeting the CAP objectives. Travelling Stock Reserves and road reserves are strategically very important as they provide regional linkages of vegetation and allow movement of species through the corridors, which assist the survival and adaptation of species to changing conditions and RLPBs, the RTA and local councils are important stakeholders in conserving Regionally Significant Vegetation and maintaining connectivity between remnants, particularly on private land where farmers and graziers will also be vital collaborators. These public lands could provide biodiversity benefits beyond those currently being realised if they are consistently managed for biodiversity outcomes.
CTB – From 2006, there will be an improvement in the extent and condition of native plants and animals, and the environments in which they live, within each Interim Bio-Regional Assessment (IBRA) sub-region of the Namoi.

**Intent:** An environment with high levels of diversity is well protected against change and is better able to resist threatening processes. The intent of the catchment target is to improve the long-term survival prospects of our native vegetation and animals through an improvement in their diversity. This will be achieved by reducing invasive species and pressures on threatened species and their habitats. A diverse environment provides opportunities for new technologies eg. pharmaceuticals and agriculture. Biodiversity also adds aesthetic, recreational and cultural values for society.

The Interim Biogeographical Regionalisation for Australia (IBRA regions) classification divides the Australian continent into 85 bioregions based on major geomorphic features. The IBRA bioregions and sub-regions provide a useful framework for reporting and assessing the status of native ecosystems, their protection in the national reserve system and for use in monitoring and evaluation. There are four bioregions in the Namoi Catchment – Darling Riverine Plains; Brigalow Belt South; Nandewar and New England Tablelands. The IBRA regions provide a recognised framework for dividing the Namoi Catchment into similar landscapes for determining targets. For example, targets for cropping land in the highly cleared black soils of the Darling Riverine Plains will be different to areas with land better suited to grazing and forestry eg. Pilliga Outwash subregion in the Brigalow Belt South Bioregion.

The Threatened Species Conservation Act 1995 and the Fisheries Management Act 1994 require comprehensive assessments of the effect of proposed landuse activities on terrestrial and aquatic Threatened Species. The Minister for Environment and Minister for Primary Industries each have the power to confer Biodiversity Certification of the Native Vegetation Reform Package to the Catchment Management Authorities provided the CAP:

- addresses the objectives of the Acts;
- meets government policy to end broad-scale clearing;
- implements biodiversity conservation programs; and
- develops systems in line with the State-wide Standard for Quality NRM.

The Catchment and Management Targets under the Native Plants and Animals Theme, along with the Aquatic Ecosystems Target (MTW3) under Surface and Ground Water Ecosystems, put in place targets, actions and activities to meet these requirements for Biodiversity Certification.

The major Impacts or Threatening Processes to the Resource and Risk to Catchment Health analysed in the Initial Environmental Review and reported in the Resource Summary tables are as follows, and will be addressed in the three Management Targets that underpin this Catchment Target:

- Clearing of native vegetation, causing complete removal or fragmentation (MTB 1)
- Invasive weeds (MTB 3)
- Feral pest animals and predation (MTB 3)
- Agricultural activities, including grazing, exotic pastures, pesticides and fertilisers, disturbance and trampling (MTB 1 and MTB 2)
- Climate change (MTB 2)
- Collection of bush rocks, firewood and removal of dead timber (MTB 2)

The table below illustrates how the Targets in the Namoi Catchment Action Plan address the State-wide Targets, National Matters for Targets and Joint Steering Committee Investor Preferences.
<table>
<thead>
<tr>
<th>Biodiversity</th>
<th>National Matters</th>
<th>JSC Investor Preferences or CMA Act</th>
<th>CMA Management Targets</th>
<th>CMA Management Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increase in native vegetation extent and an improvement in native vegetation condition</td>
<td>Native vegetation communities integrity</td>
<td>Consistent with the Native Vegetation Act 2003 and Native Vegetation Regulations 2005</td>
<td>MTB1 – From 2006, maintain or improve the extent, distribution and condition of the existing native vegetation of the catchment.</td>
<td>a) increasing the area of public and private land managed for production and native plant and animal diversity objectives; b) increasing the area managed for vegetation and wildlife conservation, with a priority on Regionally Significant Vegetation (RSV) areas; c) enhancing the extent and condition of RSV areas across the catchment, by strategic re-vegetation and regeneration; d) using the provisions of the Native Vegetation Act 2003- Property Vegetation Plans (PVP) to prevent broad-scale clearing and restricting the removal of RSV.</td>
</tr>
<tr>
<td>2. Increase the number of sustainable populations of a range of key native fauna species</td>
<td>Significant native species and ecological communities</td>
<td>Biodiversity Certification under the Threatened Species Conservation Act 1995 and Threatened Species Legislation Amendment Act 2005. Manage threats and prevent the decline in state and nationally listed threatened species and ecological communities. Reduce state and nationally listed threatening processes. Manage biodiversity hotspot areas and reduce threats to these areas. Complement and support management of the values of world heritage and national heritage places – not applicable to the Namoi as there are no listed places.</td>
<td>MTB2 – From 2006, support the recovery of priority fauna populations, and Threatened Species, Populations and Communities.</td>
<td>a) identifying priority species, populations and/or communities found naturally in the Namoi catchment; b) selecting ‘Priority Species’ which match the habitat needs and have similar threatening processes as priority Threatened Species; c) providing community education and awareness programs about priority species, and what activities threaten their survival; d) promoting Priority Species recovery through implementing recovery plans, targeted threat abatement measures, and protection of known habitats.</td>
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<tr>
<td>3. Increase in the recovery of threatened species, populations and ecological communities</td>
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<tr>
<td>4. Reduction in the impact of invasive species</td>
<td>Ecologically significant invasive species</td>
<td></td>
<td>MTB3 – From 2006, reduce the economic and environmental impacts of invasive plants and animals.</td>
<td>a) preventing establishment of new invasive plants and animals; b) limiting spread of key emerging invasive plants and animals; c) applying strategic control measures to existing invasive plants and animals, which include current pest and weed strategies.</td>
</tr>
</tbody>
</table>

Note: All JSC Investor Preferences are covered to Management Target level within the CAP. JSC Investor Preferences for CMA Actions will be addressed in the Three-Year Rolling Investment Strategies.
<table>
<thead>
<tr>
<th>What Do We Want to Achieve? (Management Targets – Native Plants and Animals (MTB))</th>
<th>How Can the Namoi Community Make This Happen? (Possible Activities for inclusion in Investment Strategies and Annual Implementation Plans)</th>
<th>CMA Role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Native Vegetation</strong></td>
<td><strong>Benchmarking, Monitoring and Evaluation</strong></td>
<td>L P</td>
</tr>
<tr>
<td>MTB1 – From 2006, maintain or improve the extent, distribution and condition of the existing native vegetation of the catchment.</td>
<td>• Define and identify areas of Regionally Significant Vegetation (RSV).</td>
<td>L</td>
</tr>
<tr>
<td>This will be achieved by the following management actions:</td>
<td>• Establish benchmarks of existing vegetation and condition.</td>
<td>L</td>
</tr>
<tr>
<td>a) increasing the area of public and private land managed for production and native plant and animal diversity objectives;</td>
<td>• Determine Performance Indicators and develop quantitative targets for each vegetation community / IBRA region, taking into account the entire IBRA region.</td>
<td>L</td>
</tr>
<tr>
<td>b) increasing the area managed for vegetation and wildlife conservation, with a priority on Regionally Significant Vegetation (RSV) areas;</td>
<td>• Undertake regular monitoring and evaluation of the extent of vegetation cover.</td>
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</tr>
<tr>
<td>c) enhancing the extent and condition of RSV areas across the catchment, by strategic re-vegetation and regeneration;</td>
<td><strong>Knowledge and Data</strong></td>
<td>L</td>
</tr>
<tr>
<td>d) using the provisions of the Native Vegetation Act 2003 - Property Vegetation Plans (PVP) to prevent broad-scale clearing and restricting the removal of RSV.</td>
<td>• Collate maps and other information of vegetation extent, distribution and condition in consistent format and make accessible to other organisations.</td>
<td>L</td>
</tr>
<tr>
<td><strong>Intent:</strong> This target is to manage existing native vegetation and improve its distribution and condition by adopting best management practices to maintain or improve the diversity of plants and animals that are found within each IBRA sub-region in the Namoi Catchment. Implicit in the objective to maintain and improve native vegetation is the assumption that this will benefit biodiversity generally and Threatened Species through the provisions of the PVP. Vegetation is an essential component of the landscape, and native vegetation targets and actions are closely connected to achieving targets in landscape, water quality and riverine ecosystem condition.</td>
<td>• Undertake additional vegetation mapping and assessment surveys on private and public land to complete vegetation data coverage for the catchment.</td>
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<tr>
<td>RSV areas are particularly good examples of a vegetation community or type that is generally underrepresented in the Namoi. They might also include native vegetation on salinity recharge areas, areas of extreme erosion hazard, regionally important corridors, areas of sighted Threatened Species or significant riparian vegetation. Once defined and identified, RSV will be targeted since it displays a number of attributes which make it particularly worthy of conservation and enhancement. Areas of RSV will be enhanced by establishing additional native vegetation in priority landscapes.</td>
<td>• Collaborate with community/ environmental groups, particularly on private land, to undertake vegetation and native fauna surveys.</td>
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<tr>
<td>The key positions responsible for achieving this target within the Namoi CMA are:</td>
<td>• Investigate economic access to or ways to produce provenant native grass seed supplies.</td>
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<tr>
<td>Native Vegetation Coordinator</td>
<td><strong>Planning and Organisations</strong></td>
<td>L</td>
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<tr>
<td>Property Vegetation Planning and Native Vegetation Project Officers</td>
<td>• CMA to take an active involvement on Brigalow Belt South - Namoi Community Consultative Advisory Committee and management of other public land.</td>
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</tr>
<tr>
<td>Potential collaborators to assist in achieving this target include:</td>
<td>• Develop and incorporate guidelines for managing for biodiversity outcomes in other Best Management Practice (BMP) guidelines.</td>
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</tr>
<tr>
<td>Landholders, Public Land managers, RLPBs, State agencies, NGOs, environmental groups, Research organisations. Additional collaborators will be identified during project development.</td>
<td><strong>Awareness, Skills and Engagement</strong></td>
<td>P</td>
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<tr>
<td><strong>Benchmarking, Monitoring and Evaluation</strong></td>
<td>• Provide education and awareness campaigns, and build trust with community about native vegetation and threatened species habitat issues,</td>
<td>P</td>
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<tr>
<td>Targets and associated Performance Indicators will be selected for each IBRA subregion, so that similar landscapes are being grouped together eg. Pilliga Outwash, Darling Riverine Plains. The issue of how to monitor condition remains unresolved, and is unlikely to be included for monitoring at regional level.</td>
<td>• Collate existing material and develop an education program, including vegetation identification, assessment of condition, importance of HCV and RSV areas and management of remnants.</td>
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<td>• Improve species recognition, through training in plants and native grass identification.</td>
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<td>• Provide and extend information about provenant native tree, understorey and grass species, including the value of native grasses in ground cover and drought resistance.</td>
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<td></td>
<td>• Encourage Indigenous Communities to be involved in native vegetation management on public land.</td>
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<td></td>
<td>• Up-skill people on the potential impacts of climate change on native vegetation and the implications for species selection and recommendations.</td>
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<td></td>
<td><strong>Implementation and Incentives</strong></td>
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<tr>
<td></td>
<td>• Provide incentives to improve vegetation management, regeneration and re-establishment in line with Land Management Unit (LMU) recommendations, particularly on over-cleared landscapes.</td>
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<td></td>
<td>• Recommend and fund only provenant native species suitable for the landscape, in plantings.</td>
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<td></td>
<td>• Integrate biodiversity focused revegetation programs with other NRM outcomes eg salinity control.</td>
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<tr>
<td></td>
<td>• Implement incentive schemes eg stewardship payments, to support landholders to manage vegetation for conservation.</td>
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<td></td>
<td>• Consider alternative funding models, including the potential for carbon credits and Biodiversity Banking for the Namoi.</td>
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<td></td>
<td>• Integrate PVP, including RSV and biodiversity threats, with Property Management Plans and</td>
<td>L</td>
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</table>

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Actions specific to the *Native Vegetation Act 2003* and Property Vegetation Plans:

Provide additional information which can be included in Catchment Action Plans in relation to Native Vegetation Management and the Property Vegetation Planning Developer Tool:

- Information that applies any state-wide native vegetation-related standards and/or targets into a regional context.
- Existing available information on regional native vegetation and biodiversity.
- Existing available information on regional soils information.
- Existing available information on regional salinity.

Activities specific to the *Native Vegetation Act 2003* and Property Vegetation Plans (PVP):

- Clearing approvals affecting Regionally Significant Vegetation (RSV) should not be approved unless a suitable offset can be provided and the activity cannot be reasonably undertaken elsewhere.
- Provide new information on vegetation, habitat and location of threatened species to DEC for inclusion in the Biometric component of the PVP Developer as it becomes available.
- Provide new information on soil health, salinity hazard, water quality and riparian vegetation or more detailed information from local and regional datasets to DNR as they become available for inclusion in the PVP Developer.
- Define and nominate Protected Regrowth areas for specific vegetation protection under the PVP to address issues such as salinity recharge, high erosion hazard, improving the extent and condition of RSV through regeneration as information becomes available.
- Nominate listing and delisting of species for Invasive Native Scrub provisions.
- Nominate species for Feral Native Species provisions.
- Nominate areas of RSV for consideration in the PVP.
- Define "minimum extent necessary" under the Routine Agricultural Management Activities (RAMAs) provisions.
- Define recommended densities for each vegetation type appropriate to this region.
- Undertake cultural heritage site assessment to supplement the PVP Developer process in assessing the impact of broadscale vegetation clearing activities under the *National Parks and Wildlife Act 1974*.
- Make recommendations about the application of the State Native Vegetation Compensation Fund.
- Local Government and CMA to reach an MoU or similar agreement to achieve efficiency on dual consent clearing applications.
- Provide technical support and education for PVP and Property Vegetation Planning.
- Encourage collaboration across CMA boundaries for consistent PVP assessment.
<table>
<thead>
<tr>
<th>What Do We Want to Achieve?</th>
<th>How Can the Namoi Community Make This Happen?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threatened Plants and Animals</td>
<td>Benchmarking, Monitoring and Evaluation</td>
</tr>
<tr>
<td>MTB2 – From 2006, support the recovery of priority fauna populations, and Threatened Species, Populations and Communities.</td>
<td>• Establish benchmarks of current status of Threatened and Priority Species.</td>
</tr>
<tr>
<td>This will be achieved by the following management actions:</td>
<td>• Determine Performance Indicators and develop quantitative targets for priority and threatened species.</td>
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<td>a) identifying priority species, populations and/or communities found naturally in the Namoi Catchment;</td>
<td>• Implement survey procedures and encourage reporting of sightings of priority species in priority areas in collaboration with community and environmental groups to provide ongoing assessment of the status.</td>
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<td>b) selecting 'Priority Species' which assist the recovery of priority Threatened Species;</td>
<td>Knowledge and Data</td>
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<tr>
<td>c) providing community education and awareness programs about priority species, and what activities threaten their survival; and</td>
<td>• Collate information on the locations and distribution of threatened species and other priority species not listed under the legislation for a conservation status, but requiring action.</td>
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<td>d) promoting priority species recovery through implementing recovery plans, targeted threat abatement measures, protection of known habitats, and minimising threatening processes.</td>
<td>Planning</td>
</tr>
<tr>
<td>Intent: The intent of this target is to improve the status of, and reduce the threats to, priority fauna species, and threatened species, populations or ecological communities found naturally in the Namoi Catchment. While the conservation of high quality vegetation is critical to achieving this outcome, this target specifically focuses on threatened plant communities and the habitats of threatened animals and bird populations, and the impacts that are threatening their survival. Implementation of this target will be informed by the new Threatened Species Priority Action Statements being prepared by DEC and DPI. The implementation of these objectives should address Biodiversity Certification conferred by the Minister for Environment under the Threatened Species Legislation Amendment Act 2005. ‘Priority species’ broadly describes the group of plant and animal species selected to focus on for the delivery of the Management Target. The species can come from any of the legislative status ie. Protected, Vulnerable, Endangered &amp; Threatened species, Populations and communities.</td>
<td>• Identify priority native fauna populations for Namoi and threatening processes that need addressing.</td>
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<td>The key positions responsible for achieving this target within the Namoi CMA are:</td>
<td>• Identify and select locally recognised ‘priority species’ for the Namoi that match the habitat needs of threatened species, and assign threat abatement measures.</td>
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<tr>
<td>Biodiversity Officer – DEC secondee</td>
<td>• Prioritise areas and options for recovery of species.</td>
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<td>Property Vegetation Planning Staff</td>
<td>• Prepare management guidelines for landholders and advisors about threat abatement and recovery measures, and how to implement Priorities Action Statements.</td>
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<td>Potential collaborators to assist in achieving this target include:</td>
<td>Awareness, Skills and Engagement</td>
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<td>State and Australian conservation agencies, particularly DEC and DEH, environmental and community groups, landholders and public land managers, Research organisations eg LWA. Additional collaborators will be identified during project development.</td>
<td>• Implement a major education campaign on the value and importance of Threatened Species including:</td>
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<td>- improve access and availability to the community of lists of threatened species</td>
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<td>- identification and legislation</td>
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<td>- management requirements, highlighting beneficial outcomes of enhancing protected species habitat</td>
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<td>- the threatening processes to plants and animals eg. removal of dead timber, feral and weed pests.</td>
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<td>• Mount an awareness campaign about the selected ‘priority species’ and educate the community about their identification, special habitat needs, and relationship to threatened species etc.</td>
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<td>• Encourage indigenous involvement, including information about values of different fauna and flora species and their totems, and include in Priority Species groups where appropriate.</td>
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<td>• Engage the community to protect biodiversity through current networks eg. bird watchers clubs</td>
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<td>• Implement Threatened Species Priorities Action Statements (PAS), including Recovery Plans and coordinated regional threat abatement measures.</td>
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<td></td>
<td>Incentives and Implementation</td>
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<td>• Provide incentive funding to undertake habitat reconstruction, and other actions to address Recovery Plans and Threat Abatement Plans.</td>
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<td>• Provide stewardship payments to people who continue to preserve habitat and maintain populations.</td>
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<td>• Use a range of policy tools eg. partnerships, Voluntary Conservation Agreements, Property Vegetation Plans, Wildlife Refuges etc. to achieve Threatened Species conservation outcomes.</td>
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<td>• Public Land managers to implement threat abatement actions and PAS on public land.</td>
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<td>• Incorporate the concept of ‘Priority Species’ into Regional Strategies, Management Plans and Roadside Management.</td>
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<td></td>
<td>• Investigate Ecotourism opportunities as a means of promoting biodiversity outcomes and awareness.</td>
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<td>• Integrate Threatened Species Conservation measures with other Management Target initiatives.</td>
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Namoi Catchment Action Plan Part B – Natural Resource Management Plan_Approved Jan07

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<table>
<thead>
<tr>
<th>What Do We Want to Achieve? (Management Targets – Native Plants and Animals (MTB))</th>
<th>How Can the Namoi Community Make This Happen? (Possible Activities for inclusion in Investment Strategies and Annual Implementation Plans)</th>
<th>CMA Role</th>
</tr>
</thead>
</table>
| **Invasive Plants and Animals**<br>**MTB3 – From 2006, reduce the economic and environmental impacts of targeted invasive plants and animals.**<br>This will be achieved by the following management actions:<br>  a) preventing establishment of new invasive plants and animals in the catchment;<br>  b) limiting spread of key emerging invasive plants and animals; and<br>  c) applying strategic control measures to existing invasive plants and animals, which include current pest and weed strategies.<br>**Intent:** This target is aimed at reducing the threats to biodiversity and sustainable agriculture posed by invasive plants and animals. Limiting the spread of weeds and pest animal species will be a key activity carried out under this target. In controlling invasive species, activities such as regeneration and reintroduction of some native species may be appropriate in some circumstances.<br>Invasive plant and animals are a significant threat to biodiversity. Invasive plants and animals include exotics and natives, aquatic and terrestrial flora and fauna. It includes listed noxious weeds and pest animals and may include over-abundant natives. This target recognises that some species will be invasive in some areas but not in others, and the species targeted for action should reflect the impact they have on high value assets. It only includes species that are considered invasive, and a threat to native vegetation and habitat or cause other environmental damage eg. erosion. Additionally, activity will be focused on prevention / limitation of spread, rather than eradication or control of extensive weeds. Targeted species are those that have the greatest negative impact on assets with environmental, economic, social or cultural values and for which there is potential to reverse the negative impact with available resources. (NRC 2005)<br>**The key positions responsible** for achieving this target within the Namoi CMA are: Science Champion for Invasive Plants and Animals<br>Field Staff<br>**Potential collaborators** to assist in achieving this target include:<br>A number of organisations which already exist with responsibilities for weed and pest animal control eg. NIWAC, RLPBs. The intent of this target is to support that work, particularly in strategic planning, co-ordination and implementation of activities that focus on weeds and pests that pose a threat to native plants and animals. Other collaborators would be Public and private landholders, State agencies, particularly DPI, environmental groups, Research organisations eg Weeds CRC. Additional collaborators will be identified during project development.<br><br><b>Benchmarking, Monitoring and Evaluation</b><br>A range of options have been put forward to NRC on Monitoring Requirements for Statewide Target for Invasive Species as a possible performance indicators.<br><br><b>Planning</b><br><br>**Benchmarking, Monitoring and Evaluation**<br>- Review economic cost and environmental damage of invasive plants and animals.<br>- Establish benchmarks, using data from local and regional authorities and other bodies eg. Weeds CRC, Bureau of Sciences, Lippia Working Group, Lands Dept, Country Energy, chemical companies.<br>- Determine Performance Indicators and develop quantitative targets for continual improvement.<br><br><b>Knowledge and Data**<br>- Develop protocols to identify and classify new invasive threats.<br>- Collect information in priority areas of extent, location and spread of invasive plants and animals, including noxious and environmental weeds.<br>- Investigate weed population dynamics eg. why weeds “explode” in certain locations.<br><br><b>Awareness, Skills and Engagement**<br>- Provide training and information to improve identification of weeds, including noxious and environmental weeds, invasive grasses etc, so people are more aware and better able to take action.<br>- Run an awareness campaign on environmental weeds and their impact eg. Media, signage.<br>- Deliver education programs on weeds and feral animals, their threat to biodiversity, impact on the environment and economy, including focusing on new landholders and rural residential dwellers.<br><br><b>Implementation and Incentives**<br>- Implement measures to prevent introduction, limit and control the spread of invasive species.<br>- Increase co-ordination of activities of existing weed organisations across the catchment eg. Weeds Councils, RTA, RLPBs.<br>- Coordinate and target feral animal control programs, including on public land.<br>- Manage roadside weeds to minimise invasion into native vegetation. Discourage the use of species that aren’t indigenous to the area.<br>- Manage weeds in riparian areas to avoid downstream translocation.<br>- Minimise the risk of ‘garden’ weeds escaping– compost / mulch, accredited nurseries for education, limits on sales of potential invasive plants.<br>- Seek incentive funding to assist with management of invasive plants and animals.<br>- Identify potential alternate uses for economic gain for invasive native species eg. Cypress pine.<br>- Implement existing regulations on feral animals.
6. Risk Assessment of Delivering The Namoi Catchment Action Plan

The Namoi CMA is serious about managing its risks, both from a business and operational sense. As a result, following the release of the Catchment Management Authorities Risk Report 2005 prepared by Deloitte Touche Tohmatsu Australia in February 2005, the Namoi CMA contracted the consulting company to facilitate a high level business risk assessment of the CMA’s operations. The objective of this risk assessment was to provide senior management and the Board with a starting point to implement Risk Management within the CMA. For each risk identified by the assessment, Deloitte provided the following level of detail contained within the ‘Risk Assessment Report’ document:

- The detailed description of the risk;
- The inherent likelihood and consequence of that risk, without considering current controls; and
- The current controls including an assessment of the effectiveness of those controls.

Each risk was then mapped to assess the type of action that the Namoi CMA should consider in response to the risk identified. Ultimately it is this level of detail that the Namoi CMA will employ to enable it to manage the inherent risks in conducting the business of the CMA.

An Operational Risk Assessment Procedure has also been developed to further minimise our exposure to mismanagement of public funds, and provide a sound basis for reducing the delivery risks.

The Namoi CMA has also identified the key risks to the achievement of each of its Catchment Management Targets. The key risks and strategies for addressing them are provided in table which follows:
## People and Their Communities

<table>
<thead>
<tr>
<th>Management targets</th>
<th>Risks</th>
<th>Strategies to Address Risk</th>
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</thead>
</table>
| **Awareness, Attitude and Knowledge**  
MTP1 – From 2006, continually improve people’s recognition of, and attitude to, NRM issues and appropriate management practices. | Communication and engagement campaigns poorly targeted at priority issues or key stakeholder groups.  
CMA staff not identifying the need for, or utilising, the most up to date knowledge and not implementing best management practice | Develop and implement an Engagement and Consultation strategy which reaches the key sectors of the community, and provides a means of ongoing feedback and review.  
Establish and maintain consultation with clients and stakeholders regarding their NRM needs, including Reference Groups as appropriate (eg. Indigenous, Local Government, environment, industry, etc)  
CMA internal Science Champions group to manage knowledge transfer and provide continual advice on BMP. |
| **Skills, Incentives and Participation**  
MTP2 – From 2006, continually increase the level of participation in NRM activities and adoption of practices which achieve the outcomes of the CAP. | Training outcomes delivered differs from Management Target outcomes.  
Partnerships not clearly enunciated to all parties.  
Reduction of funding from NHT, NAP and other sources. | Contractual agreements have been developed with NSW Dept of Primary Industries and TAFE to deliver training programs to landholders, focusing on productive, profitable and sustainable use of natural resources.  
CMA to assess training programs and provide quality control check.  
CMA enters into contractual arrangements with groups and individuals to provide incentive funding. This is to ensure outcomes consistent with CAP are achieved. Contracts are managed and monitored by CMA staff.  
Develop programs and provide incentives targeted to catchment priorities, and the most effective locations to achieve the investment principles outlined in the Namoi CMA Environmental Policy.  
Employment of support staff via Investment Strategy funds.  
CMA staff to provide advice to build capacity of groups and individuals participation in NRM projects. Deliver training programs to landholders, focusing the on productive, profitable and sustainable use of natural resources. |
| **Social and Economic Considerations**  
MTP3 - From 2006, improve the economic stability and well being of people in the Namoi Catchment. | Not being able to provide suitable training programs that meet target outcomes.  
Not being able to measure economic performance stability and well being in given the Namoi’s large agricultural sector.  
Further risks are associated with and performance /stability fluctuations in commodity prices, exchange rates and climate conditions/change. | Contractual agreements have been developed with Dept of Primary Industries and TAFE to deliver training programs to landholders, focusing on the productive, profitable and sustainable use of natural resources.  
A socio-economic analysis of Namoi catchment conducted 2006.  
Socio-economic analysis of the Namoi Region and the actions proposed in this Natural Resource Management Plan will provide information on which to refine the Catchment Action Plan, and minimise/maximise any negative/positive socio-economic impacts on the catchment community.  
Develop partnerships with key climate research agencies in order to assist decision making against the target outcomes. ie. DPI (drought & plant selection) & CSIRO (climatic) |
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<th>Management targets</th>
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<th>Strategies to Address Risk</th>
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<tr>
<td><strong>Best Management Practice (BMP)</strong>&lt;br&gt;MTL1 – From 2006, increase the area of land managed according to Best Management Practice.</td>
<td>Knowledge of the area in the Catchment managed under BMP is unknown. Without this information in the form of mapped land the MTL1 target will be difficult to quantify. There are BMP guidelines for certain industries (eg Irrigated Cotton and Irrigation). However for grazing (slopes and plains) dryland cropping, horticulture, livestock and others there is no consistent BMP process.</td>
<td>The CMA will spatially identify all areas of land that is under contract and managed for BMP through either the Namoi CMA, Liverpool Plains, Cotton CRC and other funding (Envirofund etc). CMA funded contracts ensure that data can be represented spatially into a database so that increase/take up can be monitored and reported against. Survey of current Industries employing BMPs to assess the area (ha) involved. CMA to seek external funding to identify required BMP material for industries currently lacking BMP processes.</td>
</tr>
<tr>
<td><strong>Land Capability</strong>&lt;br&gt;MTL2 – From 2006, increase the area of land used in accordance with land capability, as measured by Land Management Units (LMU) based on the Land and Soil Capability Index.</td>
<td>The current lack of information for Soil and Land Capability (SLC) Index will make it difficult to measure the current extent of land. The current lack of information of LMU’s for the whole catchment and recommended landuses and practices will make it difficult to measure the change in land use through the CMA’s ability to achieve targets. New and emerging industries are not identified and there is a failure to develop these important partnerships.</td>
<td>CMA staff allocated to the preparation of this information, and/or external funding sort for preparation of material. Ensure that all current property and subcatchment planning within the Liverpool Plains area uses the existing LMU’s. That this is extended once the SLC Index is prepared. Ensure that the relevant information is documented with current projects so that this information will be able to be incorporated into meeting the target once the SLC Index is finalised.</td>
</tr>
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<td><strong>Integrated Planning</strong>&lt;br&gt;MTL3 - By 2010, the planning strategies and instruments of state government and four local governments will be consistent with the objectives of the Namoi CAP.</td>
<td>Large parts of the Catchment may have planning inconsistencies by only working with four councils as per the target. The councils that CMA work with may not be in priority areas for investment.</td>
<td>The CMA will offer all councils in the Catchment the generic outcomes of working with the four targeted councils as per the target. The CMA will acknowledge the risk and select councils in accordance with priority areas of the Catchment.</td>
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<tr>
<td>Management targets</td>
<td>Risks</td>
<td>Strategies to Address Risk</td>
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<td><strong>Riverine Ecosystems</strong>&lt;br&gt;MTW1 – From 2006, there will be an improvement in riverine structural stability, and the condition and extent of native riverine vegetation in priority riverine areas.</td>
<td>Native riparian vegetation condition is not well understood in the Catchment therefore it would be difficult to effectively measure against the target.&lt;br&gt;No effective control options currently exist for Lippia spc. on riparian lands.&lt;br&gt;Namoi River Styles Report identifies broad reaches but not individual sites for rehabilitation using structural works.</td>
<td>CMA will further develop activities with DNR to improve the understanding of riparian vegetation condition. Option to further Remote Sensing spectral signature work at early stages of development.&lt;br&gt;Foster partnerships with research organisations to develop effective control options.&lt;br&gt;Further analysis currently underway of strategic degraded reaches to identify individual sites.</td>
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<td><strong>Surface and Groundwater Ecosystems</strong>&lt;br&gt; MTW2 – From 2006, maintain or improve surface and ground water quality suitable for irrigation, raw drinking water and aquatic ecosystem protection at Goangra Gunnedah, Narrabri; Target values are as determined by:&lt;br&gt;a) ANZECC Guidelines 2000: Irrigation Water - EC range of 650 –1300µS/cm; and Aquatic Ecosystem Protection - mean values of Total Endosulphan &lt; 0.03 µS/Litre and Atrazine &lt; 0.7 µS/Litre. &lt;br&gt;b) MDBC: River Salinity of 550 µS/cm 50% of the time, and &lt;1000 µS/cm 80% of the time at Goangra.</td>
<td>Reliance on current water quality monitoring by DNR is discontinued. This monitoring work enables the measuring of progress achieved towards target.&lt;br&gt;Local Government Authority / Environmental Protection agency managed processes will not align with CMA management targets. Assumption that industry is working with agencies to maintain or improve water quality.</td>
<td>CMA to lobby DNR and /or NSW government to maintain existing water quality monitoring network.&lt;br&gt;CMA to liaise with Local Government Authorities, EPRD (DEC), form projects and partnerships to assist and monitor progress.</td>
</tr>
<tr>
<td><strong>Aquatic Plants and Animals</strong>&lt;br&gt;MTW3 – From 2006, protect and assist the recovery of threatened or priority native aquatic species in identified priority areas.</td>
<td>Threat Abatement Plans, Recovery Plans and Threated Species Priorities Action Statements for aquatic species are not currently developed; therefore guidance on on-ground actions is also limited.&lt;br&gt;Effective Best Practice control options do not exist for the control of pest species impacting on native aquatic species.</td>
<td>CMA to work with relevant agencies (DPI Fisheries &amp; DEC) in the development of species recovery actions.&lt;br&gt;CMA to work with relevant agencies in the development of control of pest species.&lt;br&gt;CMA to seek funding to assist the community and agencies to address these targets.</td>
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<td><strong>Water Management Plans</strong>&lt;br&gt;MTW4 - From 2006, participate in and review water management planning and other processes under the Water Management Act 2000, so that Water Management Plans, including Water Sharing Plans (WSPs), result in fair and reasonable access to surface and groundwater resources for the environment (water dependant ecosystems), economic uses (agricultural, industrial, town water supply) and social values (recreation, cultural).</td>
<td>The ability to deliver fair and reasonable access to surface and groundwater resource for all water users which will be acceptable to the a community.</td>
<td>By CMA participating in and reviewing the water planning process, it will have an active role in decision making and therefore best outcomes for all water users.</td>
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**Native Plants and Animals**

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<tr>
<th>Management targets</th>
<th>Risks</th>
<th>Strategies to Address Risk</th>
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<tr>
<td><strong>Native Vegetation</strong></td>
<td>Current knowledge on the extent, distribution and condition of Native Vegetation across the Catchment is limited and at the best patchy. Without this information in the form of mapped vegetation coverage the MTB1 target will be difficult to achieve. The CMA does not currently have an agreed operational definition for RSVs.</td>
<td>As an interim measure, the CMA could investigate alternate methods in the hope of gathering the vegetation knowledge needed to progress MTB1. This measured could include an ‘Expert Panel’ process. The CMA should progress this definition using the strategy above.</td>
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<tr>
<td><strong>MTB1 – From 2006, maintain or improve the extent, distribution and condition of the existing native vegetation of the catchment.</strong></td>
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<tr>
<td><strong>Threatened Plants and Animals</strong></td>
<td>There are more Threatened Species likely to occur in the catchment than there are Threat Abatement Plans and Recovery Plans currently developed. Ultimately guidance for on-ground actions for individual species is therefore limited.</td>
<td>CMA to work with the relevant agencies (DEC) in the development of species recovery actions. The recently DEC developed Priorities Action Statement (PAS) will assist the CMA by providing the broad tools required to assist the recovery of threatened species and abate Key Threatening Processes.</td>
</tr>
<tr>
<td><strong>MTB2 – From 2006, support the recovery of priority fauna populations, and Threatened Species, Populations and Communities.</strong></td>
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<tr>
<td><strong>Invasive Plants and Animals</strong></td>
<td>Effective Best Practice control options do not exist for the control of all invasive plants and animal species currently found in the Catchment.</td>
<td>CMA to work with relevant agencies in the development of control measures. CMA to seek funding to assist the community and agencies to address this risk.</td>
</tr>
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<td><strong>MTB3 – From 2006, reduce the economic and environmental impacts of targeted invasive plants and animals.</strong></td>
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7. Monitoring, Evaluation and Review

Following approval of the CAP, a Monitoring and Evaluation (M&E) Plan will be developed for the NRM Plan, which will identify procedures and responsibilities for monitoring, reporting, evaluation and review. This will be the responsibility of the Namoi CMA Monitoring and Evaluation Coordinator. It will address the following four major components:

- resource condition monitoring to evaluate progress towards Catchment Targets and Management Targets (outcomes);
- program monitoring to evaluate the overall performance of the Namoi CMA in achieving Management Actions (outputs);
- project monitoring to evaluate whether best practice recommendations are effective and achieving the intended physical change in the landscape (inputs); and
- contract management reporting to ensure funds have been spent legitimately (accountability).

The connection between inputs, outputs and outcomes is not always readily apparent, or reflected in monitoring, in the short to medium term because of time lags in regional landscape functions. Also to be included within the M&E Plan is a “logical framework” that provides evidence, based on science and knowledge, of how inputs support the achievement of Management Targets, and in turn the Catchment Targets – which are a measure of improvement in the resource condition. Many Management Actions and activities will benefit a number of Management Targets, even though they have been listed under only one Management Target in the NRM Plan. The benefits accrued from these multiple outcomes will also be made apparent in the “logical framework”.

Resource Condition Monitoring can be costly and is the responsibility of the State agencies. The outcomes of negotiations at State level regarding the monitoring to be undertaken for State-wide Targets will determine what further monitoring programs need to be put into place at regional and local level. Wherever possible, the monitoring of resource condition at catchment scale (ie. Catchment and Management Targets), will be aligned with existing programs and build on M&E for State-wide targets.

The M&E Plan will be based on the Monitoring and Evaluation Framework for CMAs, which is consistent with the National NRM Monitoring and Evaluation Framework. The M&E Plan will also be consistent with the requirements under the NHT2 and NAP Bilateral Agreements.

A key outcome of these M&E activities is to support the process of adaptive management and continual improvement. It will be the responsibility of the Namoi CMA Monitoring and Evaluation Coordinator to ensure that these adaptive management procedures are embedded in our planning, operational and business systems.

Annual and bi-annual NAP/NHT2 reports are required by the funding bodies, who are represented on the Joint Steering Committee. These reports reflect progress made against Catchment Targets and Management Targets as agreed in the Head Agreements which contract the activities and milestones in the Three-Year Rolling Investment Strategies.

Additionally, an Annual Report on progress in achieving the CAP Targets is made to the Minister for Natural Resources. Amendments to the CAP, particularly regarding Targets or Management Actions, can occur following:
- A request by the Namoi CMA to make amendments through the Annual Report;
- A recommendation from the Natural Resources Commission; or
- A direction from the Minister that changes are required.

Factors that may lead to a need for amendment of the CAP could include:
- Changes in the institutional operating environment eg. changes to catchment boundaries, legislation, new government programs, plans and policies;
- Access to Adaptive Environmental Water, requiring the establishment of an Environmental Water Trust;
- New or enhanced technical, scientific, risk or socio-economic information;
- Outcomes from ongoing community consultation;
- Monitoring and evaluation reporting that suggests a better course of action or more appropriate Targets.

The Minister for Natural Resources can approve any CAP amendments and amend the plan by a notice published in the NSW Government Gazette.

The NRM Plan will be subject to annual internal review. External audits are conducted by the Natural Resources Commission as they see necessary, with a comprehensive review after five years.
## Glossary of Acronyms

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<tr>
<th>Acronym</th>
<th>Full Title</th>
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<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<td>AIP</td>
<td>Annual Implementation Plan</td>
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<td>ANZECC</td>
<td>Australian and New Zealand Environment and Conservation Council</td>
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<td>AWIL</td>
<td>Australian Wool Innovation Limited</td>
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<td>BASIX</td>
<td>Building and Sustainability Index</td>
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<td>BMP</td>
<td>Best Management Practice</td>
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<td>CAP</td>
<td>Catchment Action Plan</td>
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<td>CCAC</td>
<td>Community Consultative Advisory Committee</td>
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<td>CDEP</td>
<td>Community Development Employment Projects</td>
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<td>CMA</td>
<td>Catchment Management Authority</td>
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<td>CRC</td>
<td>Cooperative Research Centre</td>
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<td>DAFF</td>
<td>Department of Agriculture, Forestry and Fisheries (Australian Government)</td>
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<td>DEC</td>
<td>Department of Environment and Conservation (NSW Government)</td>
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<td>DEH</td>
<td>Department of Environment and Heritage (Australian Government)</td>
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<tr>
<td>DNR</td>
<td>Department of Natural Resources (NSW Government)</td>
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<tr>
<td>DPI</td>
<td>Department of Primary Industries (NSW Government)</td>
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<tr>
<td>EIS</td>
<td>Environmental Impact Statement</td>
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<tr>
<td>EMS</td>
<td>Environmental Management System</td>
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<tr>
<td>EP&amp;A Act</td>
<td>Environmental Planning and Assessment Act</td>
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<td>ESY</td>
<td>Ecologically Sustainable Yield</td>
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<td>GDE</td>
<td>Groundwater Dependant Ecosystems</td>
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<td>GRDC</td>
<td>Grains Research and Development Corporation</td>
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<td>HCV</td>
<td>High Conservation Value</td>
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<td>IBRA</td>
<td>Interim Biogeographical Regionalisation for Australia</td>
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<td>JSC</td>
<td>Joint Steering Committee (made up of National and State agencies who administer the Natural Resource Management Programs ie. DAFF, DEH, DNR, DEC)</td>
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<td>LEP</td>
<td>Local Environmental Plan</td>
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<td>LG</td>
<td>Local Government</td>
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<td>LGA</td>
<td>Local Government Area</td>
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<td>LMU</td>
<td>Land Management Unit</td>
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<tr>
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