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# Report for Natural Resources Commission

## Review of evidence against NRC attributes Namoi upgraded Catchment Action Plan

November 2011

GHD has prepared this report for the Natural Resources Commission. The evidence that is summarised within this report is being used by the NRC as one input, among others, into the NRC's overall assessment of the Namoi upgraded Catchment Action Plan (the CAP).

This GHD report is not the NRC's assessment of the CAP and does not represent the findings and recommendations the NRC will make to government on the CAP. Readers should refer to the NRC Assessment Recommendation Report – Namoi Upgraded Catchment Action Plan, which contains the NRC's assessment and recommendations on the Namoi upgraded CAP.

For further information of how the NRC undertakes its assessment, readers should refer to the NRC's Framework for assessing CAPs.



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## Acronyms used in this report

CAP	Catchment Action Plan
CEO	Chief Executive Officer
CMA	Catchment Management Authority
INFFER	Investment Framework for Environmental Resources
MDBA	Murray Darling Basin Authority
M&E	Monitoring and Evaluation
MERI	Monitoring, Evaluation, Reporting and Improvement
NLGG	Namoi Local Government Group
NRC	Natural Resources Commission
NRM	Natural Resource Management
OEH	Office of Environment and Heritage
SOG	Senior Officers Group
SWT	State Wide Target



# 1. Introduction and executive summary

## 1.1 Background

The Natural Resources Commission (NRC) recommends Catchment Action Plans (CAPs) to the Government, who is then responsible for approving them. The NRC's *Framework for assessing and recommending upgraded catchment action plans* sets out the NRC's expectations for upgraded CAPs, and how the upgraded CAPs will be assessed.

The framework specifies that the NRC will assess CAPs against three criteria relating to both the quality of the planning process undertaken, and the quality of the final plan. The NRC will determine whether each CAP:

- Was developed using a structured, collaborative and adaptable planning process;
- Uses best available information to develop targets and actions for building resilient landscapes; and
- Is a plan for collaborative action and investment between government, community, and industry partners.

For each criterion the NRC identified three attributes, reflecting what the NRC expects to see as demonstration of performance against each criterion.

## 1.2 Purpose of this review

The NRC contracted GHD to collect evidence as to how the Namoi upgraded CAP (September 2011) and its planning process meets each of the attributes described in the NRC's assessment framework.

This report collates GHD's evidence as to how the Namoi CAP meets each of the attributes, and identifies the CAP's key strengths and gaps against these attributes. The evidence was collected through analysis of available documentation; technical reviews; stakeholder interviews; and engagement with the Namoi Catchment Management Authority (CMA), government and community partners and the NRC.

This report will be used by the NRC as one input to its overall assessment of the CAP. Further information about the NRC's assessment can be found in the *Framework for assessing and recommending upgraded catchment action plans*.

## 1.3 Summary of the CAP's strengths and gaps against the attributes

The following text summarises the CAP's key strengths and gaps against the attributes for each criterion, identified through GHD's evidence review process. Further detail about the CAP's performance against each of the attributes is set out in sections 3 to 5.



### **1.3.1 Attributes indicating the CAP was developed using a structured, collaborative and adaptable planning process**

The CMA planned and managed the CAP upgrade as a systematic project involving eight documented stages. The CAP upgrade commenced with a review of the current CAP and resilience thinking to inform a tailored resilience assessment of the catchment under four themes – Biodiversity, Landscape, Water and People. Draft catchment targets and actions were developed based on thresholds arising from the resilience assessment. The targets and actions were refined through spatial analysis, policy alignment, expert review and consultation with government and the community.

The processes are documented and were iteratively refined during the CAP upgrade. This provides a transparent basis for the CAP upgrade process and future revisions. Future CAP revisions could be further strengthened by including in the supporting documents how the alternative strategies for achieving possible catchment outcomes were considered.

The CAP upgrade process and use of resilience thinking has contributed to increased strategic capability in the CMA through greater understanding of the catchment, clarity on priorities and targets, CMA/stakeholder roles, and the purpose of the CAP upgrade and Whole of Government approach.

The effectiveness of stakeholder engagement was variable, with the community reporting a higher level of meaningfulness than some agencies. The agency concerns relate to the transparency, timing and expectations of their engagement and the CAP upgrade itself. The tighter focus of catchment targets also created challenges and some conflict around the breadth and depth to which government policies were represented in the CAP upgrade. The development of the Namoi CAP was one of the first two, to pilot the Whole of Government approach, and these issues highlight the importance of effective (timely and continuous) CMA and stakeholder engagement as part of the CAP development process. Earlier and more targeted engagement between the CMA and agencies may have improved CMA-agency understanding of the implications of a resilience approach for NRM objectives and targets in the region.

The CMA conducted an internal review of the previous CAP including progress against actions and the applicability of catchment and management targets to inform the CAP development. The CMA has put an adaptive planning process in place to evaluate the effectiveness of the CAP and guide improvements. For instance, the CMA plans to review the CAP annually and proposes criteria to identify when changes to the CAP are significant enough to require re-authorisation through Ministerial approval. Also, the importance of stakeholder engagement in adaptive management, including in further prioritisation and investment/action planning, is recognised in the CAP. The key mechanism reported in the CAP for achieving this is through reference group participation (the CAP proposes creation of three socio-economic sub-regions based on broad landuse patterns, and Whole of Government reference groups). Clearly documenting and gaining stakeholder support for the terms of reference for these groups will be essential to effective adaptive management of the CAP.

The CAP also identifies actions to improve the community's adaptive capacity through the People theme.



### **1.3.2 Attributes indicating CAP uses best available information to develop targets and actions for building resilient landscapes**

The CAP uses a catchment and four thematic conceptual models and evidence (including underlying assets, drivers, trends and thresholds) to describe the Namoi catchment's systems. The catchment scale description provides an overview of how the social and ecological system functions and the key trends and drivers which the planning process considered and CAP seeks to address. The thematic descriptions are also at a catchment scale, showing the key underlying assets, interactions and thresholds where possible. The Support Document summarises the analysis for each theme.

The CMA used a comprehensive evidence collection process involving literature reviews, spatial analysis, resilience assessments, experts and consultation to review and analyse best available science and community knowledge. This also included utilisation of earlier scenario planning work by the CMA.

The CAP's integrated regional analysis of the assets and systems across the four themes provides meaningful insight into the catchment's resilience and function. The overall description of the catchment could be further strengthened by inclusion of sub-regional analysis, which is acknowledged in the CAP and will be addressed during the initial implementation phase.

The CMA has completed a systematic and comprehensive assessment of the available evidence to develop strategies to improve the landscape function and resilience of the Namoi catchment. The assessment was structured around themes within which key thresholds, control variables and cross-scale interactions were identified. Adaptive capacity in the region was assessed in the planning process.

The overall approach is conceptually sound, albeit limited by availability of data, useable methods and the need to integrate themes, targets and policies not based on resilience thinking. There were challenges in determining some thresholds, especially in the People theme.

Future strategy development can be strengthened through greater integrated analysis of themes (or socio-ecological systems) at a Whole of Catchment and sub-regional scales.

The CAP logically outlines ten catchment targets, based on 16 thresholds with 67 associated actions grouped into the themes of Biodiversity, Land, Water and People. A benefit statement for state-wide targets and key policies is outlined for each theme. If achieved they are likely to make a significant contribution to the state-wide targets and improve catchment function. A logic model would improve understanding of how they are expected to contribute to this. The catchment targets are at catchment and thematic scales, which will be refined to a sub-regional scale through on-going adaptive management of the CAP.

### **1.3.3 Attributes indicating CAP is a plan for collaborative action and investment between government, community and industry partners**

The CMA collected evidence on NRM policies and community aspirations to inform the CAP development. Consideration of alignment with state NRM plans and policies occurred, but at a stage later in the CAP development than may be optimal for the development of a CAP that has a Whole of Government intent. However, this was a pilot process and the CMA was testing new concepts and the CMA and agencies were learning how to most effectively achieve Whole of Government alignment and understanding. Consultation with agencies, prior to finalising the CAP, has occurred since to improve understanding, usefulness and alignment with relevant NRM plans and policies.



Community values were drawn from existing CMA knowledge of the catchment and consultation during the planning process.

The CAP's alignment with community values and NRM policies should continue to be strengthened during implementation through the planned establishment of government and community reference groups. The process for improving alignment needs to be defined for the reference groups to function effectively.

The CAP is logically organised and provides a comprehensive range of information on the CAP, how it was developed and the underpinning evidence. The CAP clearly states a suite of targets and actions to guide stakeholders in their individual and collective decision making. The supporting information on the catchment and resilience assessments also provides stakeholders with a valuable resource. The resilience based approach is generally seen by stakeholders involved as a sound basis for the CAP.

The usefulness of the CAP can be strengthened by improving the format, layout and maps of the CAP's main body to improve readability. The sub-regional mapping proposed during implementation will improve the quality and usefulness of the CAP through deeper analysis and clearer presentation.

The CMA collaborated and consulted with the major stakeholders and partners to develop the upgraded CAP. This approach allowed the CMA and stakeholders to explore potential roles and responsibilities in an adaptive manner.

The CAP specifies roles for stakeholders against actions for each of the four themes. Consultation with major stakeholders during the finalisation of the CAP included, in some instances, discussion of roles and responsibilities for proposed actions. The detailed roles and responsibilities for specific activities will be determined during implementation, and facilitated through the proposed government, local government and community reference groups.

#### **1.4 Structure of this report**

This report presents GHD's summary of evidence regarding how the Namoi upgraded CAP meets the NRC's CAP assessment attributes for each criterion. The report is structured as follows:

- Section 2 describes the methodology used to undertake the review of evidence;
- Section 3 outlines how well the CAP meets the three attributes supporting criterion 1;
- Section 4 outlines how well the CAP meets the three attributes supporting criterion 2; and
- Section 5 outlines how well the CAP meets the three attributes supporting criterion 3.

Appendices A and B list the references used and stakeholders interviewed during the assessment.



## 2. Methodology

The Namoi CAP was initially developed through a pilot process against a working draft of criteria and attributes<sup>1</sup>. Through this process the NRC undertook a pilot assessment of the draft pilot CAP, and refined the criteria and attributes for assessing upgraded CAPs. During and following the pilot assessment, Namoi CMA updated the CAP, and consulted further with agencies, experts and other stakeholders before submitting its final draft CAP in September 2011.

GHD has collected evidence as to how the Namoi upgraded CAP meets the attributes, including identification of strengths and gaps. GHD collected evidence during the pilot assessment process. GHD also reviewed early evidence for relevance and collected further evidence once the final draft Namoi CAP was submitted.

The following methods were used to obtain evidence:

- Desktop reviews;
- Interviews with CMA Board, CMA staff, agency representatives and community stakeholders; and
- Technical reviews.

### 2.1 Collection of evidence and identification of strengths and gaps

GHD collated and analysed evidence from desktop reviews, interviews and technical reviews to identify the CAP's strengths and gaps against each attribute. Each of these steps is described in more detail below.

#### 2.1.1 Desktop review

GHD conducted a desktop review of the earlier and final versions of the upgraded CAP and supporting documents against the NRC's attributes. The desktop reviews collected evidence from the final CAP and supporting documents about how the CAP meets the attributes, including identifying any strengths or gaps.

#### 2.1.2 Semi-structured interviews

GHD led semi-structured face to face interviews with CMA staff and Board members involved in the CAP development process. Interviews with agency and community representatives (including landholders, Landcare, local government, Namoi Aboriginal Advisory Committee and industry representatives) were also held face-to-face and/or via telephone. The interviews added to the overall evidence base, particularly helping to address information gaps arising from the desktop review and providing greater insight into, and understanding of, the CAP development process. Appendix B outlines the interviewees.

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<sup>1</sup> NRC (2010), Working draft: Criteria and Attributes for Upgrading Catchment Action Plans, July 2010



### **2.1.3 Technical reviews**

Technical reviews were undertaken during the pilot assessment and reviewed again for relevance following the submission of the final draft CAP. Technical reviews focused on collecting evidence against the attributes for Criterion 2. This included looking at the CAP's:

- Use of best available knowledge and appropriate analytical frameworks (e.g. resilience);
- Catchment targets, including underlying systems analysis, assumptions, program logics, nesting of targets and causal links between targets at different scales; and
- Analysis of risk and trade-offs when considering alternatives.

Technical reviews were conducted individually by two reviewers.

## **2.2 Reporting**

The CAP's strengths and gaps against the attributes, and the relevant supporting evidence for these, have been summarised and documented in this report.

A draft of this report was provided to the CMA and NRM agencies for feedback and, as appropriate, the report was updated to address feedback received.

GHD's report will be used by the NRC as an input into the NRC's broader CAP assessment process.



### 3. Outcomes from a review of evidence against the attributes for criterion 1

This section describes outcomes of the evidence reviewed against the attributes for Criterion 1 for upgraded CAPs; that the CAP was developed using a structured, transparent and adaptable planning process.

The quality of a strategic plan depends on the quality of the knowledge and planning processes that underpin it. Much of the worth in any planning process lies in building improved strategic planning capacity within an organisation and among its partners.

The attributes supporting Criterion 1 are shown in the table below.

**Table 1 Description of Criterion 1 and attributes**

Criterion	Attributes
1. CAP was developed using a structured, transparent and adaptable planning process	<p>A. Strategic planning process was logical, comprehensive and transparent</p> <p>B. Planning process meaningfully engaged the community, governments and other stakeholders</p> <p>C. An adaptive planning process is in place to evaluate effectiveness of the CAP and guide improvements as knowledge improves and/or circumstances change</p>

GHD has gathered evidence around these attributes, as presented in the rest of this report chapter.

#### 3.1 Attribute 1A. Strategic planning

##### **Strategic planning process was logical, comprehensive and transparent**

The NRC expects to see a systematic, planned and documented approach to upgrading CAPs. CAPs are strategic plans for NRM, so the process should draw on well-established strategic planning principles. For example, the planning scope should be informed by a clear understanding of the CMA and stakeholder objectives for the CAP upgrade, and a clear understanding of the CMA business and the roles, responsibilities and capacity of others in the catchment.

Typical strategic planning processes will identify and consider a range of possible strategic objectives. For CAPs, this could mean considering different desired futures for the catchment communities and landscapes. The CAP planning process should also evaluate alternative approaches for meeting the strategic objectives, and refine the objectives through this process. In practice, the degree of consideration given to alternatives depends upon the risk and investment level particular to the catchment, and the time and resources available to the CMA.

The planning process should be well documented and communicated within the CMA. Information about the planning process should also be made available to relevant external stakeholders, including details about the stakeholder engagement process and updates on key planning milestones or decisions.



The NRC will also expect to see that the process engaged and built capacity of CMA staff at all levels, especially the CMA Board, so that all parts of the organisation feel ownership of the plan and are ready to implement it.

### 3.1.1 Summary of strengths and gaps against attribute 1A

The following table sets out what GHD found when reviewing the CAP and CAP planning process against attribute 1A.

**Table 2 Summary of strengths and gaps against attribute 1A**

Attribute	Outcomes from review of evidence
Strategic planning process was logical, comprehensive and transparent	<p><b>Strengths:</b></p> <ul style="list-style-type: none"><li>• The CAP upgrade was a systematic project, implemented through eight documented steps, underpinned by rigorous analysis and available evidence</li><li>• The strategic capability of CMA staff and board was built through involvement in the CAP upgrade planning process</li></ul> <p><b>Gaps:</b></p> <ul style="list-style-type: none"><li>• The range of possible catchment outcomes and alternative strategies to achieve them were considered during the planning process but not specifically explained in the CAP or Support Document</li></ul>

### 3.1.2 Supporting evidence for attribute 1A

#### **The CMA planned, managed and documented the pilot CAP upgrade as a systematic project.**

Plans were developed to guide the planning [13] and stakeholder consultation [14] at the start of the CAP upgrade process. The review plan [13] outlines that the process would be consultative and based on assessments of the previous CAP, stakeholder needs, best available NRM and policy knowledge, resilience thinking and risks. The CAP Pilot Project Report [1, Appendix B] describes the eight stages of the update process as:

1. Review of current CAP
2. Review of resilience thinking theory
3. Completion of a resilience assessment for the Namoi Catchment
4. Draft targets based on thresholds from resilience assessment
5. Mapping of priorities
6. Alignment with state priorities
7. Consultation with stakeholders and the catchment community (throughout the planning process)
8. Incorporation of catchment community feedback and submissions



In determining strategic objectives for the catchment, **the range of possible catchment outcomes and alternative strategies to achieve them were considered**, however the CAP and Support Document [1, 2] do not specifically explain how they were considered during the planning process. These were explored through earlier scenario planning work; the thematic expert groups for each theme; workshops with government agencies, local government and the community; as well as supporting analysis undertaken by the CMA and agencies [1, 2]. Clearer documentation of these considerations in the CAP's supporting documentation would further increase the transparency of the CAP and strengthen the justifications for the chosen targets and actions.

The strategic objectives for the catchment can be summarised as avoiding the crossing of the 16 critical thresholds identified for the four themes of Biodiversity, Land, Water and People and attempting to maintain those systems in a safe operating space. Each asset also has a similar high-level objective, e.g. "healthy soils and functional landscapes that are managed in a way that maintains optimal choices for future generations."

**The CMA staff and Board were involved in the pilot CAP upgrade process** [1]. Interviews with the CMA indicate that the Board and management considered key findings and were involved in key decisions on the pilot CAP. The wider staff was kept informed and involved where relevant [5].

Resilience thinking was a useful concept which, along with the process of upgrading the CAP, has contributed to **improved strategic capability within the CMA**. Resilience thinking also supported the CMA's design intent of simplifying technical information to make the CAP more accessible to the community. Some of the reported benefits [5] include:

- Enabling a focus on what is critical and highlighting catchment, as well as investment, priorities;
- Being able to critically review previous plans and investments effectively;
- Highlighting information gaps to inform future knowledge development;
- Highlighting the importance of systems and the concept of cumulative risk to better understand and address the impact of mining; and
- Providing a common framework to increase understanding and learning.

### **3.1.3 Conclusions for attribute 1A**

The CMA planned and managed the CAP upgrade as a systematic project involving eight documented stages. The CAP upgrade commenced with a review of the current CAP and resilience thinking to inform a tailored resilience assessment of the catchment under four themes – Biodiversity, Land, Water and People. Draft catchment targets and actions were developed based on thresholds arising from the resilience assessment. The targets and actions were refined through spatial analysis, policy alignment, expert review and consultation with government and the community.

The processes are documented and were iteratively refined during the CAP upgrade. This provides a transparent basis for the CAP upgrade process and future revisions. Future CAP revisions could be further strengthened by including in the supporting documents how the alternative strategies for achieving possible catchment outcomes are considered.

The CAP upgrade process and use of resilience thinking has contributed to increased strategic capability in the CMA through greater understanding of the catchment, clarity on priorities and targets and CMA/stakeholder roles.



### 3.2 Attribute 1B. Engaging stakeholders

#### Planning process meaningfully engaged the community, governments and other stakeholders

CAPs are plans for collaborative action and investment. Therefore, the planning process must meaningfully engage those stakeholders with an interest in plan implementation, or whose activities have an influence on landscape health and the likelihood of the CAP being effectively implemented. This will include: local, state and Australian Governments; Landcare and other community and non-government organisations; Indigenous and non-Indigenous land managers; industry; and the scientific community.

There are three main components to this attribute – was there a plan for who to engage and how and why to engage them? Was the plan executed effectively? Do the partners have the capacity to collaborate in implementation? The views of stakeholders will be considered when determining whether the engagement has been meaningful. However, engagement is a two-way process, and reviewers should also consider how effectively agencies and other stakeholders participated and contributed to the processes facilitated by the CMA.

The NRC’s audits have shown that community engagement is a key strength of the regional model and the NRC will be expecting strong performance in this area. The NRC recognises that other stakeholder relationships, for example, with agencies, are still evolving. However, with the strong commitment of the Natural Resource and Environment Chief Executive Officer (CEO) Cluster Group and the Senior Officers Group to Whole of Government CAPs, the NRC will expect to see effective agency-CMA collaboration.

#### 3.2.1 Summary of strengths and gaps against attribute 1B

The following table sets out what GHD found when reviewing the CAP and CAP planning process against attribute 1B.

**Table 3 Summary of strengths and gaps against attribute 1B**

Attribute	Outcomes from review of evidence
Planning process meaningfully engaged the community, governments and other stakeholders	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>The planning process engaged stakeholders and was guided by a consultation plan</li> <li>The planning process built strategic capability of those stakeholders involved</li> </ul> <p><b>Gaps:</b></p> <ul style="list-style-type: none"> <li>Earlier and more targeted engagement with agencies may have improved CMA-agency understanding of the implications of a resilience approach for NRM objectives and targets in the region.</li> </ul>

#### 3.2.2 Supporting evidence for attribute 1B

The CMA worked with the community, NRM experts and scientists relevant to the catchment, state government agencies, local government and resilience thinkers to develop the CAP [3]. Stakeholder engagement was planned and guided by a CAP Review Consultation Plan [14] and both formal and informal engagement activities have been documented by the CMA [5]. Industry consultation was predominantly focused on the agricultural sector. The Consultation Plan clearly outlines how stakeholder engagement informs the analysis underpinning the CAP and mechanisms to engage them, but not how stakeholder support and agreement for the CAP would be achieved during the planning process.



The CAP Project Report [1] describes the **involvement of partners and stakeholders**:

- Workshops were held with NRM experts from across the catchment and beyond throughout March and April 2010 for each of the four themes, to draw together available knowledge to help identify assets critical to each theme, and draft conceptual models for each;
- Direct consultation occurred with the Namoi Councils group, Namoi Local Government Group (NLGG) and individual councils. The NLGG was consulted regarding the CAP development methodology and the targets and thresholds. A presentation was made to Namoi Councils regarding the CAP methodology and the CMA sought advice on how to best engage with elected representatives of Local Government. A series of presentations were delivered to all Councils (bar two) to explain the purpose and method of CAP review and the relevance for Local Government. Local Government staff also attended the consultation workshops;
- A series of community meetings (12 in total) were held across the catchment in August 2010. This included a review of targets and activities delivered under the previous CAP, a presentation on resilience thinking and the results of the resilience assessment, an overview of proposed targets and activities, and facilitation of feedback; and
- The CAP was made available for public comment. Seven formal submissions were received and the CAP Pilot Project Report [1] outlines the changes made to the CAP as a result of those (pp 22, 39-48).

A range of stakeholders were interviewed around the meaningfulness of their initial (up to March 2011) engagement in the development of the pilot CAP. The reported **meaningfulness of engagement was variable, with local government and community groups reporting more meaningful engagement than government agencies**. Stakeholder comment referencing the meaningfulness of their engagement in the CAP upgrade process includes:

*“Some of the workshops were held during the day and some in the evening, which was a good way of ensuring coverage....They went to some significant areas where you wouldn’t normally have input. Lots of areas that may not have received attention before, so good geographical coverage.” [4]*

*“I liked the way the CMA presented the CAP upgrade to us; we could have our say about the issues on the land. It makes sense to me and my community” [4]*

*“It would have been nice for [the agency] to have been able to have some representation at each of those meetings [across the region] but it’s not possible [in terms of distance and competing priorities].” [4]*

*“We (local council) were consulted in the development of the CAP and when the draft was exhibited, I attended an excellent workshop which tested the CAP with the community”[4]*

An evaluation of community meetings by the CMA [1; pp 17-20] also found the large majority of participants either agreed or **strongly agreed** that: the resilience presentation was useful; adequate opportunity for input was provided; and they would like more information regarding the CAP [1].

The Whole of Government approach requires two way CMA-and agency engagement to: **develop, build support and endorse** the CAP during the upgrade process. Given that the Whole of Government approach was still at an early development stage, the planning process faced issues associated with



resourcing, conflict management, role definition, communication and the quality of working relationships established.

While workshop invitations were extended to agencies, there were issues with agency attendance due to notice times [4], limiting the effectiveness of this as a mechanism for agency input into a Whole of Government CAP. In addition, some agencies did not initially see engagement in the pilot CAP planning processes as a core business activity, and were also concerned about transparency, timing and expectations for their engagement. Agencies provided written feedback on the CAP and further engagement between the CMA and NSW NRM agencies was undertaken in mid-2011. This has led to **stronger alignment and integration** between the CAP and NRM policies [12].

Agency understanding of what a CAP is has changed as a result of their participation in the CAP upgrade. There is now a better understanding of CAPs, the upgrade process, and what it is supposed to do. The change in attitude and understanding has been generally positive overall.

The CAP planning process **built NRM and strategic capability to some extent, which varied among stakeholders**, as evidenced through the Pilot Project Report [1], and interviews with stakeholders and CMA CAP planners. Stakeholder comment referencing NRM and strategic capability built through engagement in the CAP upgrade process includes:

*“The extent to which the resilience assessment process was able to build NRM and strategic capability in agencies varied between agencies, as agencies are tied to their own particular conceptual frameworks” [5]*

*“My involvement in the CAP upgrade, and on the Namoi Aboriginal Advisory Committee generally, helps Aboriginal communities to develop and plan.”[4]*

*“The resilience model has given us (local government) something tangible. I now have those critical thresholds in the back of my mind when I am making decisions.” [4]*

### **3.2.3 Conclusions for attribute 1B**

The effectiveness of stakeholder engagement was variable, with the community reporting a higher level of meaningfulness than some agencies. Agency concerns relate to the transparency, timing and expectations of their engagement and the CAP upgrade itself. The tighter focus of catchment targets also created challenges and some conflict around the breadth and depth to which government policies are represented in the CAP upgrade. These issues highlight the importance of effective (timely and continuous) stakeholder engagement as part of the CAP development process. Earlier and more targeted engagement with agencies may have improved CMA-agency understanding of the implications of a resilience approach for NRM objectives and targets in the region.

The CAP development process and use of resilience thinking has, however, contributed to improved strategic capability through greater understanding of the catchment, greater clarity on priorities and targets, and the purpose of the CAP upgrade and Whole of Government approach.



### 3.3 Attribute 1C. Adaptive planning

#### An adaptive planning process is in place to evaluate effectiveness of the CAP and guide improvements as knowledge improves and/or circumstances change

An adaptive approach is necessary in NRM which is characterised by uncertainty, complexity and lack of information. A CAP should therefore specify how its implementation will be monitored, how progress will be evaluated, and the CAP adapted. The NSW Monitoring, Evaluation and Reporting Strategy and Australian Government’s NRM Monitoring, Evaluation, Reporting and Improvement Framework provide some guidance on this important aspect of CAPs.

This attribute covers both how the experiences in implementing the existing CAP have been used to inform the planning process, and how the CMA is planning to adaptively manage in the future in response to new information, changing circumstances, emerging risks, and monitoring and evaluation results. The CMA should also consider potential triggers for plan adaptation, and how to involve all relevant stakeholders in future revision of the CAP. For example, potential adaptation triggers relate to significant policy changes.

#### 3.3.1 Summary of strengths and gaps against attribute 1C

The following table sets out what GHD found when reviewing the CAP and CAP planning process against attribute 1C.

**Table 4 Summary of strengths and gaps against attribute 1C**

Attribute	Outcomes from review of evidence
An adaptive planning process is in place to evaluate effectiveness of the CAP and guide improvements as knowledge improves and/or circumstances change	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>The CAP upgrade was informed by a comprehensive review of the previous CAP and findings of the NRC audit</li> <li>The suite of proposed approaches provides a sound framework to inform CAP reviews (criteria, timing, evidence collection, analytical tools)</li> <li>Community Reference Panels and Whole of Government Reference Groups will be established to support implementation and review</li> </ul> <p><b>Gaps:</b></p> <ul style="list-style-type: none"> <li>No specific gaps</li> </ul>

#### 3.3.2 Supporting evidence for attribute 1C

A **review of the previous CAP** formed stage 1 of the upgrade process and included an internal review of progress against the actions in the CAP and the applicability of the catchment and management targets [1]. The outcomes of the NRC CAP implementation audit, and agreed adaptive management responses, were also considered as part of this initial stage of the CAP upgrade [1]. The development of targets and actions in the new CAP were informed by the review findings [1]:

The capture of climate change issues, emissions trading, Murray Darling Basin Authority (MDBA) planning processes, and a marked increase in concern regarding extractive industry were elements found to be insufficiently addressed in the previous CAP. Another review finding was that the targets did not align in a linear manner with State Wide Targets (SWTs), were not particularly measurable, and not sensitive to time delays and the magnitude of change required [1]. Also, actions needed to be written to avoid premature dating of the CAP but still provide guidance to the community; and needed to be



'inviting' and in plain English so others can pick up an action and do something about it even at the smallest scale.

The CAP [3] outlines the process for **review and adaptation of priorities** in several ways. The plan contains an **Annual Investment Plan development flowchart** illustrating at a very high level how Monitoring, Evaluation, Reporting and Improvement (MERI) and adaptive management processes will influence annual investment planning [3]. **Annual internal reviews** will include the results of CAP actions regarding various studies and analysis tasks, the outcomes of ongoing Monitoring and Evaluation (M&E) activities and the results of knowledge gap projects (the CAP outlines the large scale resource condition trends that will be monitored to track progress towards thresholds of potential concern, against the targets the thresholds apply to) [3].

**A register** of recommendations emerging from evaluations, research and audits (including documentation of organisational responses and changes to plans and policies) will provide a clear and concise evidence base for ongoing adaptive management of the CAP and the programs resulting from its implementation [3. P77].

The CAP also proposes **reviews of newly developed policies or plans** with a view to achieving ongoing alignment and collaboration, particularly in light of ongoing improvements in understanding of the catchment and the appropriateness of targets and actions contained within the CAP. Ongoing **investigation and trialling of new technologies** for developing rankings to prioritise targets and actions in any one year will also be pursued. This includes Investment Framework for Environmental Resources (INFFER), and ways to better integrate social and economic considerations into program priorities [3].

Three **sub-regional reference groups** have been planned, based on three broad socio-economic groups defined by broad landuse patterns at the sub-regional level (Tablelands, Plains and Slopes). The sub-regions will be mapped and the communities will be encouraged to define the critical resources and thresholds that are likely to impact the socio-ecological system in each area in order to inform future priorities, investment and actions [3].

The CAP [3] references the **Namoi MERI Strategy** and its link to adaptive management: "M&E are the building blocks of adaptive management, providing the data and information to inform practice and management.... Namoi CMA has prepared the Namoi CMA MERI Strategy to provide guidance on how M&E will occur at the catchment scale. The Namoi MERI Strategy will be reviewed on Ministerial approval of the CAP to ensure it aligns with the new direction."

The CMA is clear in its intention to update both the CAP and its priorities as new information is brought to bear and proposes **criteria which might trigger re-submission** of the CAP for approval as a result of updates [3].

The on-going governance arrangements within the CMA provide the basis for annual review of the CAP in light of changing circumstances. The proposed development of a general resilience model for the Namoi catchment will provide a framework to robustly and transparently analyse changing circumstances and inform revisions. The adaptation process does not specifically outline roles and responsibilities but does propose the following **review/check points**:

- Internal review on an annual basis; and
- Resubmission of the CAP for approval of any significant changes.



### **3.3.3 Conclusions for attribute 1C**

The CMA conducted an internal review of the previous CAP including progress against actions and the applicability of catchment and management targets.

The CMA plans to review the CAP annually and criteria have been proposed to identify when changes to the CAP are significant enough to require re-authorisation through Ministerial approval.

The importance of stakeholder engagement in adaptive management, including in further prioritisation and investment/action planning, is recognised in the CAP. The key mechanism reported in the CAP for achieving this is through sub-regional and Whole of Government reference group participation. Clearly documenting and gaining stakeholder support for the terms of reference for these groups will be essential to effective adaptive management of the CAP.



## 4. Outcomes from a review of evidence against the attributes for criterion 2

This section describes outcomes of the evidence reviewed against the attributes for criterion 2 for upgraded CAPs; that the CAP uses best available information to develop targets and actions for building resilient landscapes.

This criterion focuses on how evidence and analysis have been used to determine the strategies, targets and actions identified in the CAP. This criterion and its attributes also refer to building resilience in landscapes.

The attributes supporting Criterion 2 are shown in the table below.

**Table 5 Description of Criterion 2 attributes**

Criterion	Attributes
2. CAP uses best available information to develop targets and actions for building resilient landscapes	<p>A. CAP describes the socio-ecological systems operating in the catchment using best available science and knowledge of community values</p> <p>B. CAP integrates biophysical and social information to analyse the systems operating in the catchment and develop strategies for improving landscape function and resilience</p> <p>C. CAP proposes targets and actions that are logically nested and supported by the available evidence</p>

GHD has gathered evidence around these attributes, as presented in the rest of this report chapter.

### 4.1 Attribute 2A. Describing socio-ecological systems

#### **CAP describes the socio-ecological systems operating in the catchment using best available science and knowledge of community values**

An up-to-date and comprehensive knowledge base should provide the basis for developing strategies and setting targets. This attribute examines how knowledge has been collected and managed, and what plans are in place to fill identified knowledge gaps over time.

The attribute also addresses the use of this knowledge to provide a description of the region's landscape in terms of linked socio-ecological systems. This will provide a starting point for the more detailed analysis referred to in the following attribute. Even if a CMA chooses not to fully adopt a resilience approach, they should be aiming to include this description of the landscape in the CAP, demonstrating an understanding of:

- How social and ecological elements of the landscape fit together;
- The important values and big issues in the catchment;
- Disturbances, trends and how the landscape is changing;



- The history of the landscape and its possible futures; and
- How the different parts of the landscape are governed and who is involved in management.

It is important that the CAP is underpinned by the best available knowledge. However, as it is a strategic document, the CAP need not contain all the detailed technical information upon which it is based. Instead, this evidence may be included in supporting documentation, signposted through references or provided to stakeholders through collaborative processes.

#### 4.1.1 Summary of strengths and gaps against attribute 2A

The following table sets out what GHD found when reviewing the CAP and CAP planning process against attribute 2A.

**Table 6 Summary of strengths and gaps against attribute 2A**

Attribute	Outcomes from review of evidence
CAP describes the socio-ecological systems operating in the catchment using best available science and knowledge of community values	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• The CAP describes the catchment and landscape function in terms of inter-related systems, assets and associated drivers and shocks</li> <li>• The CAP development involved comprehensive collection and use of evidence from multiple sources focused on critical thresholds</li> </ul> <p><b>Gaps:</b></p> <ul style="list-style-type: none"> <li>• There is a lack of sub-regional spatial analysis and mapping (acknowledged gap)</li> <li>• There is limited analysis of integration of socio-economic systems with the ecological systems (acknowledged gap)</li> </ul>

#### 4.1.2 Supporting evidence for attribute 2A

The CAP [3] includes a high-level description (Section 2.4) and conceptual model (Figure 2- Conceptual model: critical functions of the Namoi catchment) of the **catchment’s linked socio-ecological system** (the biophysical, economic and social systems). Figure 2 summarises the CMA’s understanding of how the biophysical assets interact with the socio-economic sub-system to generate well-being and maintain choices. The maintenance of choices, which takes a central place in Figure 2, is foundational to adaptive capacity [6]. The CAP also provides a **systems-based description for each of the themes** (Biodiversity, Land, Water and People) through conceptual models of key interactions and **catchment scale maps** of key underlying assets within themes.

Section 2.4 (Defining characteristics of the Namoi catchment) and 2.5 (Shocks and drivers) demonstrate an understanding of the **values and big issues** in the catchment. This understanding is supplemented by a description of how the catchment has changed over the last 50 years (Section 2.2). The description of the catchment focuses on the key elements of Figure 2, i.e. critical functions, and Section 2.5 describes the key drivers of change in the catchment over the next 30 years, highlighting **extractive industries, water and carbon policy, and climate variability** in particular. The CAP notes that particular attention will be paid to how extractive industry development should occur in the catchment, and the impact of mining on the values of agriculture, infrastructure, forestry, native vegetation, nature conservation, recreation and water is a focus. A series of individual regional scale maps shows the distribution of these values and mining/exploration titles across the catchment, although they are not analysed.



The CAP describes the history of the landscape and very briefly outlines **possible futures related to the** 'enormous potential for further economic growth via the development of its coal, mineral and gas resources' (p19). The CAP also notes the balance between economic development pressures and maintaining resilience of the catchment as one of its greatest challenges.

An understanding of how the different parts of the landscape are governed and who is involved in management is demonstrated through:

- Appendix D of the CAP, which describes the role of different sections and functions of the NSW government in NRM; and
- The inclusion of the different agencies and other organisations and stakeholders involved in addressing each action for each catchment target [3].

The Pilot Project Report [1] outlines how **best available knowledge** was identified for the plan. The CMA's existing knowledge base, built over the previous six years, was complemented in a number of ways. First, **expert workshops** were used to define assets and gather 'large amounts of information' about those assets which were grouped into four themes – Biodiversity, Landscape, Water, and People. The workshops collected information on asset description and identification of appropriate scale, current state of the asset, trend in condition of the asset (including levels of confidence and sources of supporting data), key drivers and threats behind the identified trend, the available evidence base, thresholds (known or suspected), controlling variables and linkages and feedback loops with other themes or assets.

Following the workshops, research was undertaken to **document the available evidence** supporting the views that had emerged in the workshops and fill any knowledge gaps. The data collection priorities followed from the asset and threshold identification process, which is a sound approach [6].

This involved a literature review of all available published material, and further discussions with relevant experts. References are from peer reviewed journals, reports and websites. They are up-to-date in that a substantial proportion is recently published [2,3,6]. Within each theme the coverage of topics appears appropriate, covering theories, methods, ecological and biophysical drivers, processes and responses, condition and trends. The literature review prioritised the identification of trend information, thresholds and conceptual models. **Information specific to the Namoi** Catchment was utilised where possible. Otherwise, results were extrapolated from research undertaken on a similar system(s) in other regions.

**Knowledge gaps** are identified and actions proposed for filling them. The CAP recognises there are gaps in information, particularly regarding the resilience analysis and thresholds, and states that a major future focus is to establish where the thresholds might lie in relation to using both ground and surface water in a manner that does not push these systems into undesirable states [2]. Knowledge gaps are tabulated within each theme in the Supplementary Document [2], and summarised in the Expert Group Appendices [2], which show where there is uncertainty about thresholds and what assumptions were made. There are three knowledge acquisition actions for Biodiversity, one for Land, six for Water, and seven for People [6]. The actions tables for each target also identify a number of activities relating to information collection, e.g. surveying threatened species, investing in methodologies to establish groundcover baselines, investing in data collection and analysis to establish where sub-catchment extraction is over 33% of natural flow [3]. These actions were recently considered as part of the Annual Investment Plan process, prioritised for action and drawn together in a knowledge products project plan [13].



#### **4.1.3 Conclusions for attribute 2A**

The CAP uses a catchment and four thematic conceptual models and evidence (including underlying assets, drivers, trends and thresholds) to describe the Namoi catchment's systems. The catchment scale description provides an overview of how the socio-ecological system functions and the key trends and drivers which the planning process considered and CAP seeks to address. The thematic descriptions are also at a catchment scale, showing the key underlying assets, interactions and thresholds where possible. The Support Document summarises the analysis for each theme.

The CMA used a comprehensive evidence collection process involving literature reviews, spatial analysis, resilience assessments, experts and consultation to review and analyse best available science and community knowledge.

The CAP's integrated regional analysis of the assets and systems across the four themes provides meaningful insight into the catchment's resilience and function. The overall description of the catchment could be strengthened by inclusion of sub-regional analysis, which is acknowledged in the CAP and will be addressed during the initial implementation phase.

#### **4.2 Attribute 2B. Developing strategies for improving landscape function and resilience**

##### **CAP integrates biophysical and social information to analyse the systems operating in the catchment and develop strategies for improving landscape function and resilience**

This attribute focuses on how information has been used to analyse what is happening in the catchment, and determine what the CMA and its partners can do to improve landscape function and resilience. In meeting this attribute, CAP planners should use spatial information tools, in addition to other tools, to assist in analysing and integrating biophysical and social information to identify and describe their region's systems and determine priorities.

The pilot process trialled resilience thinking as a new analytical approach. However, this does not preclude the use of alternative planning methods to develop strategies and targets.

If CMAs choose to undertake resilience analyses, typical analytical steps will include:

- Analysing the socio-ecological system and sub-systems, how they function, their drivers and controlling variables, feedbacks and thresholds, and their linkages with systems above and below the regional scale (this analysis is often depicted in state and transition models);
- Identifying and prioritising controlling variables, feedbacks and thresholds critical for maintaining the system in a healthy, productive state;
- Assessing the proximity of the critical controlling variables to the thresholds;
- Estimating the consequences for landscape and community values if key thresholds are crossed; and
- Identifying and prioritising actions and targets to either manage the landscape to stay within critical thresholds or transform into an alternate but desirable state.



This analysis is referred to in the literature as ‘specified resilience’, that is, the resilience of specific parts of the socio-ecological system to specific shocks or disturbances. A resilience analysis will also cover ‘general resilience’ which is about the system’s capacity to cope with shocks and disturbances that are not anticipated. When developing strategies for improving landscape function, planners will also have to consider whether it is possible to adapt to foreseeable changes in the landscape, or whether some transformation is necessary.

#### 4.2.1 Summary of strengths and gaps against attribute 2B

The following table sets out what GHD found when reviewing the CAP and CAP planning process against attribute 2B.

**Table 7 Summary of strengths and gaps against attribute 2B**

Attribute	Outcomes from review of evidence
CAP integrates biophysical and social information to analyse the systems operating in the catchment and develop strategies for improving landscape function and resilience	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• The CAP’s integrated regional analysis of assets and systems across four themes provides meaningful insight into the catchment’s resilience and function</li> <li>• The CMA investigated the consequence of crossing thresholds at various scales within themes to inform the CAP targets and actions</li> </ul> <p><b>Gaps:</b></p> <ul style="list-style-type: none"> <li>• Some of the thresholds in the CAP cannot be defined or are not measurable making them difficult to monitor</li> <li>• People theme analysis is limited by the current level of knowledge of how to integrate socio-ecological systems (acknowledged gap)</li> </ul>

#### 4.2.2 Supporting evidence for attribute 2B

The CAP provides a preliminary assessment of resilience in the catchment that covers most asset classes in the region. Catchment assets are assigned to four ‘**themes**’ – Biodiversity, Land, Water and People. Each theme comprises multiple assets [6]. Themes were chosen since they aligned with State Targets and provided a practical structure for the expert workshops. The **assessment included:** asset description and identification of appropriate scale, current state of the asset, trend in asset condition, key drivers and threats behind the identified trend, the available evidence base, known or suspected thresholds, identification of controlling variables, and linkages and feedback loops to other themes or assets [1].

The **focal scale is regional**, but the CAP acknowledges the existence and importance of its sub regions (Tablelands, Slopes and Plains). The CAP states the CMA’s intention to identify and assess the socio-ecological sub-systems within these sub-regions [6] via the planned establishment of community reference groups (see 3.3.2) [5].

The Expert Groups and CAP planning team have done considerable **analyses of cross-scale interactions within themes** [3; Figures 3 & 6 and associated text]. Thresholds and controlling variables were identified at several scales. Critical thresholds were assumed, logically, to be those with the greatest number of ‘key linkages’ or ‘underpinning functions’ and seem sensibly chosen. Some selections were supported by evidence; otherwise they were presented as assumptions or hypotheses and identified as such. There is a good discussion, for example, about how highly localised ecological



pressures, driven by paddock scale management decisions, can result in the loss of paddock trees and by implication how these losses can, when aggregated, lead to declines in water quality [6].

Social thresholds are also discussed and some identified. Buffers are identified in relation to some thresholds. This is a significant advance on most other attempts to apply resilience thinking [6].

The CAP acknowledged that **segregation** by theme goes against resilience thinking, which requires analysis of interactions among assets, across as well as within, themes as a step prior to the ranking and selection of the critical thresholds and their controlling variables. A planned integration workshop after the thematic assessment was not completed due to time and resource constraints. The CMA did address cross-theme interactions in a small way in the influence diagram of critical functions at the regional scale [3; Figure 1]. Other influence diagrams of interactions among assets [3; Figures 3 and 6] all show interactions among assets within single themes [6]. When questioned about the logical flaw in the single-theme approach, several interviewees showed excellent understanding of cross-theme and cross-scale interactions. The CAP also now includes a flow chart describing the Annual Investment Plan development process, which is underpinned by a rigorous process [11] for **prioritising thresholds and controlling variables** across themes based on their:

- Contribution to critical catchment functions;
- Current closeness to the threshold value;
- Temporal risk of breaching the threshold;
- Impact, cost and achievability of actions; and
- Time lag to benefits [6].

This approach is exemplary and should be published when completed [6].

The **People** theme was acknowledged by the CMA to be the **most difficult** to analyse due to lack of information and practical cost-effective analytical tools to integrate socio-economic and biophysical analysis across themes. However it was clear that the CMA interviewees have good intuitive understanding of social and economic processes in the region. The use of the five capitals approach worked for the purposes of the CAP because it led readily to a discussion of drivers, status and trends in adaptive capacity, thence to catchment targets and actions for building adaptive capacity [6].

The planning process (and CAP) demonstrates the identification of variables, feedback and critical thresholds for **maintaining systems** in a healthy state via the conceptual models provided for terrestrial biodiversity, soil health, and water function. The 'What does all this mean?' section at the end of each theme in the Support Document [2] provides a **summary narrative** regarding a suggested way forward in light of the information provided for all the different aspects of the asset under question. The CAP notes that taking a resilience approach means risk is encapsulated as targets and actions designed to ensure thresholds are not crossed despite the possible onset of one or more shocks or drivers of change. The **consequences** of crossing key thresholds are outlined in the Support Document [2] where the impact of current trends is discussed for each component of each asset. The description of thresholds often includes a description of consequence as well.

The Supplementary Document [2] contains an assessment of the current status of and trends in **adaptive capacity** in the region, expressed in terms of intellectual capital, experience, leadership, skills, capacity to imagine a different future, knowledge and data, cultural diversity, sense of belonging, self-knowledge, and physical and mental health. Only some are supported by evidence. Links among the



components of adaptive capacity are hypothesised in Figures 104 and 105 [2]. The actions specified for increasing adaptive capacity indicate where the 'People' expert group saw either shortfalls in adaptive capacity, or a good opportunity to enhance that capacity, or both [6].

#### **4.2.3 Conclusions for attribute 2B**

The CMA has completed a systematic and comprehensive assessment of the available evidence to develop strategies to improve the landscape function and resilience of the Namoi catchment. The assessment was structured around themes within which key thresholds, control variables and cross-scale interactions were identified. Adaptive capacity in the region was assessed in the planning process.

The overall approach is conceptually sound, albeit limited by availability of data, useable methods and the need to integrate themes, targets and policies not based on resilience thinking. There were challenges in determining some thresholds, especially in the People theme.

Future strategy development can be strengthened through greater integrated analysis of themes (or socio-ecological systems) at a Whole of Catchment and sub-regional scales.

### **4.3 Attribute 2C. Proposing targets and actions**

#### **CAP proposes targets and actions that are logically nested and supported by the available evidence**

A CAP should be positioned at a strategic level over a five to ten year timeframe, rather than at an operational level. CAPs should describe results that are expected from implementation, timeframes for achieving the results, and priorities for investment that can inform annual planning.<sup>2</sup> A CAP's targets and priorities should be designed to encourage and accommodate investment by a broad range of potential partners. Shorter-term plans directing operational and investment decision-making can be nested under the CAP.

The NRC expects CAPs to include targets that are:

- Based on the evidence and analyses described above;
- Logically nested in a hierarchy;
- Supported by justified assumptions and program logic; and
- Beyond the scope of the CMA alone to achieve so that they can encompass the actions and responsibilities of partners.

The final targets should provide a frame for negotiating shorter-term, time bound and achievable (SMART) targets in investment programs, or in other negotiated investments with the NSW or Australian Governments. Targets included in investment programs must demonstrate their logical links with the CAP targets through robust program logic, and allow investors to hold partners accountable for implementation.

The CAP is a strategic document that CMAs and partners should be held accountable to at a strategic level. Individual CMAs and partners should then have flexibility to prioritise investments and actions to

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<sup>2</sup> Under s 20(1) (a) (b) of the Catchment Management Authorities Act 2003.



suit shorter-term investment plans, based on the available resources and in line with the broad responsibilities and targets agreed in the CAP.

CAPs have typically contained catchment targets that are long-term and aspirational, and management targets that are shorter-term and often framed as an aggregation of outputs or actions. Each CAP should use a logical hierarchy for nesting targets that suits the particular business and investment planning needs of the CMA and its partners.

#### 4.3.1 Summary of strengths and gaps against attribute 2C

The following table sets out what GHD found when reviewing the CAP and CAP planning process against attribute 2C.

**Table 8 Summary of strengths and gaps against attribute 2C**

Attribute	Outcomes from review of evidence
CAP proposes targets and actions that are logically nested and supported by the available evidence	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• Catchment targets are focused on improving landscape function at theme level and linked to actions and state-wide targets and underlying evidence</li> <li>• The CAP establishes priority actions for building community adaptive capacity</li> </ul> <p><b>Gaps:</b></p> <ul style="list-style-type: none"> <li>• The lack of a logic model limits explicit understanding of the causal linkages between actions and targets</li> </ul>

#### 4.3.2 Supporting evidence for attribute 2C

The plan contains **targets to improve landscape function for the themes** of Biodiversity, Water, Land and People. This includes catchment targets that are generally strategic in nature rather than operational. They are long-term targets aimed at avoiding the crossing of critical thresholds. Catchment targets are chosen so as to be compatible with state-wide targets, and actions are nested within each catchment target. The catchment targets are designed to provide a framework for negotiating shorter-term, time bound and achievable targets as part of Annual Investment Plans. As currently set, the targets could be achieved via a wide range of different mechanisms and are therefore sufficiently broad in scope to encompass the actions and responsibilities of partners.

The **actions and benefit statements** associated with each target were developed from evidence reviewed, the expert workshops, and consultation with government and community stakeholders based on the criteria of what is both practical and contributes to the target. The planning documentation describes a process of re-testing and re-checking a range of **assumptions** that natural resource managers make about how the catchment works in the resilience assessment stage. Section 2.8 (Resilience thinking) outlines the key understandings emerging from the resilience assessment process which essentially is a list of key assumptions underpinning the CAP's targets [2]. The assumptions, actions, targets and benefit statements collectively provide the basis of a program logic for the CAP which should be integrated into the MERI Plan when updated.

The proposed targets are based on the analysis of the socio-ecological system. **Catchment targets are based on the most 'critical thresholds'**. Critical thresholds are the thresholds of the 'most critical'



assets, i.e. those assets having the greatest number of key linkages or underpinning functions. Based on what needed to occur to prevent these critical thresholds being crossed, catchment targets were developed. The planning process describes the evolution of catchment targets to maintain close alignment with state-wide targets [2,3].

The Expert Groups for the Biodiversity and Water themes analysed **cross-scale interactions** within each theme, and carried this understanding through to the specification of management actions to affect the controlling variables and thresholds identified at each scale. The actions however are fairly generalised; that is, do not always specify the kinds of measures the CMA proposes to deploy in order to achieve desired outcomes, e.g. private and public land manager behaviour change [6]. Prioritisation of actions was done at sub-regional, ecosystem, land management unit, river reach, floodplain, aquifer, and community (presumably ecological) scales.

The CAP [3] prioritises the building of **resilient social capital** by increasing adaptive capacity and sustaining or improving wellbeing. These form catchment targets under the People theme, with their own actions. Proposed actions can be summarised as:

- Developing a shared understanding of targets, drivers, shocks, thresholds, adaptive capacity and resilience;
- Developing indicators of adaptive capacity;
- Understanding vulnerability;
- Better information flows; and
- Education and training.

The actions are broadly around developing an understanding of adaptive capacity through partnerships and information sharing.

#### **4.3.3 Conclusions for attribute 2C**

The CAP outlines ten catchment targets, based on 16 thresholds with 67 associated actions grouped into the themes of Biodiversity, Land, Water and People. A benefit statement for state-wide targets and key policies is outlined for each theme. If achieved the catchment targets are likely to make a significant contribution to the state-wide targets and improve catchment function. Inclusion of a logic model would improve understanding of how such contribution is expected to occur. The current targets are at catchment and thematic scales, which will be refined to a sub-regional scale through on-going adaptive management of the CAP.

The CAP also identifies actions to improve the community's adaptive capacity through the People theme.



## 5. Outcomes from a review of evidence against the attributes for criterion 3

This section describes outcomes of the evidence reviewed against the attributes for criterion 3 for upgraded CAPs; that the CAP is a plan for collaborative action and investment between government, community and industry partners.

Achieving improvements in NSW landscapes requires the involvement, commitment and effort of multiple parties in NRM. A CAP should be a plan for collaborative action and investment by these parties in a catchment region. This means that a CAP should aim to align with relevant government policies and community values, provide a forum for agreeing common goals and define priorities for all to work towards. A CAP like this is both 'Whole of Government' and 'Whole of Community'.

The attributes supporting Criterion 3 are shown in the table below.

**Table 9 Description of Criterion 3 attributes**

Criterion	Attributes
3. CAP is a plan for collaborative action and investment between government, community and industry partners	<ul style="list-style-type: none"><li>A. Plan aligns with relevant NRM policies and community aspirations</li><li>B. Plan can meaningfully guide governments, industry and the community to align effort across the region</li><li>C. Plan specifies agreed roles and responsibilities for partners in the catchment</li></ul>

GHD has gathered evidence around these attributes, as presented in the rest of this report chapter.

### 5.1 Attribute 3A. Policy and community alignment

#### Plan aligns with relevant NRM policies and community aspirations

This attribute focuses on the role of CAPs at the catchment scale in aligning values that are expressed at a range of other scales. It is about aligning local, state and national priorities with community values, as well as in some cases aligning disparate pieces of state policy and bringing them together at the regional scale.

Complete alignment of all stakeholder needs may not be possible. The CMA and agencies will need to determine the most important policy areas to pursue, establish the degree of alignment that is feasible now, identify the areas of commonality, and design strategies to improve alignment over time.

CAPs are expected to align with a large number of state level policies and strategies. To inform CAP development and help improve alignment across relevant policies, plans and strategies, the Senior Officers Group (SOG) has determined a list of high priority plans for alignment based on their significance and feasibility of alignment. CMAs and agencies should refer to the SOG's *Register of policies, plans and strategies relevant to upgrading CAPs* for more information.



A National Water Commission project in the Hunter-Central Rivers CMA region demonstrated a methodology for aligning water allocation and catchment planning, and identified some good methods for negotiating alignment.<sup>3</sup>

However, in some cases, restructuring and improvement of policies and plans is needed at the state-wide scale before CAPs can reasonably be expected to bring them together at the regional scale. The NRC expects that the knowledge and priorities being developed in upgraded CAPs will support the review and improvement of relevant policies and plans.

### 5.1.1 Summary of strengths and gaps against attribute 3A

The following table sets out what GHD found when reviewing the CAP and CAP planning process against attribute 3A.

**Table 10 Summary of strengths and gaps against attribute 3A**

Attribute	Outcomes from review of evidence
Plan aligns NRM policies and community aspirations	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>NRM policies and community aspirations were identified and alignment between these and the CAP is described</li> <li>The CMA tested alignment through stakeholder consultation</li> </ul> <p><b>Gaps:</b></p> <ul style="list-style-type: none"> <li>Lack of timely engagement with and by agencies limited the facilitation of a shared understanding of the (Whole of Government) intent of alignment</li> </ul>

### 5.1.2 Supporting evidence for attribute 3A

**Alignment with state plans and priorities** formed Stage 6 of the CAP upgrade process. The CAP lists those plans and priorities that 'were possible to align with' (11 examples) and those 'not included as they are still under development or not relevant to the catchment or did not provide direction applicable to the scale or priorities of the CAP' (six examples) [3]. A '**benefit statement**' under each theme in the CAP [3], describes how each catchment target will benefit the relevant government plan(s) or policy(s). While useful, the statements do not provide a structured alignment process for developing the plan.

The consideration of alignment at Stage 6 rather than earlier in the development of the CAP, and variable effectiveness of engagement with agencies to facilitate a shared understanding of the intent of alignment, created some conflict when agreement was not easily achieved on policies such as the NSW Biodiversity Strategy. The difference in analytical approaches adopted to determine priorities and both the CMA and agencies exploring how best to implement the Whole of Government approach through the pilot process, also affected the extent to which alignment was considered and achieved.

<sup>3</sup> The National Water Commission funded a project involving CMAs, the NSW Office of Water, the former Department of Environment, Climate Change and Water and the NRC to collaboratively develop a methodology for aligning water allocation planning and catchment planning. This methodology was piloted in the Hunter-Central Rivers CMA region and is now being implemented across NSW. The Central West CMA has demonstrated that the methodology can also be applied for the draft Biodiversity Strategy, and potentially other policies. Hamstead, M. (2010) Alignment of water planning and catchment planning, Waterlines report, National Water Commission, Canberra.



The CMA and agencies have worked together to address these matters. For instance, the Office of Environment and Heritage (OEH) and the CMA have resolved issues about the CAP's focus on managing native vegetation extent differing from the draft NSW Biodiversity Strategy's prioritisation based on rarity, connectivity and condition. The 'NCMA Negotiated responses to NRM SOG feedback on Draft Namoi CAP' [12] outlines the outcomes recently agreed between Namoi CMA and the relevant agencies on earlier issues and recommended responses around alignment with plans and priorities. These outcomes have generally included changes to the CAP where relevant, or no required change for a range of reasons.

The revised CAP explains that the CMA has undertaken a **range of initiatives** since its inception to identify, understand and recognise what the **catchment community values** in the Namoi Catchment. This has included a range of approaches to identify stakeholder needs and values including specific research such as ongoing broad Community Benchmarking Evaluations and a targeted Living Culture Study undertaken with the Aboriginal Community. There have also been specific mapping exercises to inform priorities and program development [3]. The CMA took as **'given' the values of the general public** as indicated by various policy positions, legislative platforms etc. For example, it was assumed that biodiversity was a value that the public held and the assessment then focused on how to protect that value rather than involving itself in the debate about whether it should be a value or not [1]. The 'lack' of focus on explicitly determining community values during the CAP upgrade process was explained in interviews with CMA staff by the fact the CMA felt it had "a **fairly good sense of community values**" at the initiation of the upgrade, through the existing work done by the Namoi CMA "over the last couple of years." Also: "The maturity of the organisation means we now have a good grounding with our community and their values." [5]

The key strategies outlined to **improve alignment during CAP implementation** include:

- Exploring the establishment of permanent Whole of Government reference groups;
- The establishment of community reference panels (see 3.3.2); and
- The review of new plans or policies (that impact on the catchment and the implementation of the CAP) as they are developed, with a view to achieving ongoing alignment and collaboration.

### **5.1.3 Conclusions for attribute 3A**

The CMA collected evidence on NRM policies and community aspirations to inform CAP development. Consideration of alignment with state NRM plans and policies occurred, but at a stage later in CAP development than may be optimal for the development of a CAP that has a Whole of Government intent. However, this was a pilot process and the CMA was testing new concepts and the CMA and agencies were learning how to most effectively achieve Whole of Government alignment and understanding. Consultation with agencies, prior to finalising the CAP, has occurred since to improve understanding, usefulness and alignment with NRM plans and policies.

Community values were drawn from existing CMA knowledge of the catchment and consultation during the planning process.

The CAP's alignment with community values and NRM policies should continue to be strengthened during implementation through the planned establishment of reference groups. The process for improving alignment needs to be defined for the reference groups to function effectively.



## **5.2 Attribute 3B. Guiding governments, industry and the community to align effort across the region**

### **Plan can meaningfully guide other governments, industry and the community to align effort across the region**

Stakeholders will be seeking varying levels of information and guidance from the CAP depending on their own needs and resources. To accommodate diverse stakeholder needs, CAPs should be designed so that anyone wanting to participate in NRM in the catchment can use it to inform or guide their own activities. This means CAPs should be easily understandable, and the underpinning knowledge and analysis should be accessible and easy to use. CMAs need to consider what level of information should be published in the CAP itself, and what is better to include in supporting documentation or reference.

Spatial tools will be important for communicating and building stakeholder buy-in. Practically, this means that CAPs should contain maps of areas of high environmental value, sensitivity and areas of high priority for targeting management effort. The scope and scale of the spatial representation of CAPs will vary according to the needs of the CAP partners and spatial data availability. Spatial data will be important to better align CAP targets with local government's NRM priorities and local environment plans (and associated plans), and vice versa.<sup>4</sup>

However, the NRC recognises that the spatial needs of all potential partners cannot be comprehensively covered in an upgraded CAP. For example, at this point in time it is impractical for CAPs to present information at the property scale needed to directly inform local government land use planning. However, the spatial products presented in the CAP should provide context for the CMA to work with partners collaboratively to produce spatial analyses at finer scales to meet various partners' requirements on an as-needs basis.

Spatial analysis is critical to the methodology for aligning catchment and water allocation planning demonstrated in the Hunter-Central Rivers CMA region.<sup>5</sup> It will also be particularly important to allow CMAs to influence implementation of the Carbon Farming Initiative and the National Wildlife Corridors Plan.

### **5.2.1 Summary of strengths and gaps against attribute 3B**

The following table sets out what GHD found when reviewing the CAP and CAP planning process against attribute 3B.

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<sup>4</sup> Department of Planning and Infrastructure has been developing a set of NRM Clauses that can be used in local environment plans covering land, water and biodiversity. These clauses also give local government guidance on what maps should accompany each clause and what supporting data is required. These requirements were developed with the knowledge that CAPs were likely to become more spatial.

<sup>5</sup> Hamstead, M (2010), op. cit.



**Table 11 Summary of strengths and gaps against attribute 3B**

Attribute	Outcomes from review of evidence
Plan can meaningfully guide other governments, industry and the community to align effort across the region	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• The CAP is logically organised and provides a comprehensive range of information on the CAP, how it was developed and the supporting evidence</li> <li>• The CAP provides a systems based representation of the catchment, and targets and actions are meaningful to stakeholders</li> </ul> <p><b>Gaps:</b></p> <ul style="list-style-type: none"> <li>• The main body of the CAP is hard to follow in some sections due to extensive use of tables, dense text and small/detailed maps</li> <li>• Maps are only at a catchment scale on single issues, which limits the ability to demonstrate the depth of integrated analysis underpinning the CAP</li> </ul>

### 5.2.2 Supporting evidence for attribute 3B

The CAP is presented as two documents. The main body of the CAP focuses on thresholds, targets, actions and the involvement of stakeholders in those actions [3]. This is complemented by significant supplementary information in the form of a Support Document [2].

The main body of the plan [3] is **logically organised**. The extensive use of tables, small yet detailed maps, plain layout and at times dense text make the report **hard to follow in some sections**.

The **executive summary** provides a useful overview of the CAP’s purpose and introduces the thresholds and targets for the four themes of Biodiversity, Land, Water and People. An ‘**Introduction**’ section explains the resilience approach to the CAP, a summary of how the CAP was developed, a high-level conceptual model of the CAP, alignment with the Standard for Quality NRM, an explanation of the external operating environment in which the CAP sits, and an explanation of how to read the CAP. The next section – ‘**The Namoi Catchment**’ – describes the catchment now, how it has changed over the last fifty years, and the key assets of the catchment (Biodiversity, Land, Water and People assets). It also provides a good narrative description of the catchment in terms of its socio-ecological systems, supported by a high-level conceptual model of the critical functions of the catchment. It also describes shocks and drivers and provides a range of maps relating to the identified values in the catchment. **The subsequent sections provide detailed information on the thresholds, targets, actions and the involvement of stakeholders in those actions, for each of the four themes of Biodiversity, Land, Water, and People.** These sections provide conceptual models of the systems underpinning the four themes, and asset-specific maps where relevant. The provision of maps in the relevant sections (rather than being cross-referenced elsewhere) aids understanding and interpretation. Finally, the plan explains **implementation** of the CAP, including investment planning, the engagement of other organisations and the community in CAP implementation, adaptive management of the CAP, and monitoring and evaluation.



The CAP **contains maps at a catchment scale** to communicate areas of high environmental value, sensitivity and high priority for management effort. The CAP notes the intention behind the mapping of priorities was to clearly show where investment should be directed to ensure that the relevant thresholds were not crossed. Areas where thresholds had already been exceeded have not been mapped as a priority unless they were included as a priority in the NSW Office of Water or (the then) Department of Environment, Climate Change and Water mapping. The intention behind the maps presented was that despite being based on complex data and analysis, they be clear and easy to read by members of the Catchment Community. The constraints of catchment scale mapping and presentation of maps on an A4 page make the detailed **maps hard to read**. This limits the ability of the CAP, through its maps, to inform investment opportunities and engage the community. Sub-regional mapping showing the outcome of integrated thematic or critical issue analysis would significantly strengthen the CAP. For example there are eight maps relating to catchment values and mining, which are not integrated or analysed, limiting their value. The proposed sub-regional analysis should aid this.

The Supplementary Document [2] and CAP [3] do not describe the process for understanding the information needs of other natural resource decision-makers and land use planners. However **the resilience based representation of the catchment and development of targets is generally seen by stakeholders as a powerful approach to developing understanding of the catchment and establishing goals to improve landscape function**.

General community support for the CAP appears to be high. A range of stakeholders participating in the pilot CAP development workshops commented that the CAP and involvement in its development was useful for their 'community' in informing and guiding natural resource decision-making. Importantly stakeholders, including Local Government, identified that resilience thinking; thresholds; and catchment targets provided a useful concept and guide their own decision making and planning [4].

The CMA has provided a response to all NSW government agency feedback received, describing agreed positions on agency concerns or comments [12]. The CMA has sought to improve the meaningfulness of the CAP for those stakeholders by addressing these comments prior to finalising the CAP.

The CMA states that it is seeking to establish working relationships with planning authorities to ensure the CAP is considered in their deliberations. The CMA also plans to engage the mining sector in the identification of thresholds, cumulative development impacts and risk management [3, p69].

An observational and evaluation survey was conducted for the 12 community workshops held across the catchment in August 2010. The survey report notes: "Generally the targets and activities were viewed positively. They were seen as achievable with some useful additions being suggested for incorporation. Some liked the simple layout that they could grasp easily and quickly. Whilst some still looked for further detail, they were satisfied with the suggestion that they as individuals go and view the Resilience Assessment on the Namoi CMA website as advised. A few would have liked to see the mining issue addressed directly; however were accepting of the Namoi CMA positioning on the issue." [1, p35]



A range of stakeholders participating in the CAP development workshops commented on the usefulness of the CAP for their 'community' in informing and guiding natural resource decision-making:

*"The resilience model has identified real thresholds of concern rather than trying to better align with LEPs. This was an issue with the previous CAP. I hope we have now got closer to shared outcomes we can work towards"* [4]

*"The resilience model has given us (local government) something tangible. I now have those critical thresholds in the back of my mind when I am making decisions"* [4]

*"The CAP brings together information in a form that is accessible to the community...it will be useful, for example, in assessing future impacts of mining"* [4]

In addition, an evaluation of community meetings by the CMA [1; pp 17-20] found the large majority of participants either agreed or **strongly agreed** that: the CAP targets and activities were understood; the CAP was relevant; and the idea of thresholds, shocks and drivers is useful [1].

The Department of Planning and Infrastructure suggests the CAP could include a section on alignment with the Land Use Planning System (or similar) that would identify relevant land use strategies and show how the CAP is consistent with their aims and objectives. This could be cross-referenced to Appendix 1, which shows the role of land use planning in NRM [8]. While a useful and relevant concept (it is a statutory requirement that CAPs be consistent with planning instruments), the current scale of planning strategies (local rather than regional) limits the ability of the CAP to meaningfully do this. This is an important future consideration, especially given a regional planning strategy is currently being prepared for the Namoi region.

Overall stakeholders are supportive of the CAP and the upgrade process as a means to establish transparent and aligned catchment goals to support on-going investment and action.

### **5.2.3 Conclusions for attribute 3B**

The CAP is logically organised and provides a comprehensive range of information on the CAP, how it was developed and the underpinning evidence. The CAP clearly states a suite of targets and actions to guide stakeholders in their individual and collective decision making. The supporting information on the catchment and resilience assessments also provides stakeholders with a valuable resource. The resilience based approach is generally seen by stakeholders involved as a sound basis for the CAP.

The usefulness of the CAP can be strengthened by improving the format, layout and maps of the CAP's main body to improve readability. The sub-catchment mapping proposed during implementation will improve the quality and usefulness of the CAP through deeper analysis and clearer presentation.



### 5.3 Attribute 3C. Agreeing roles and responsibilities

#### Plan specifies agreed roles and responsibilities for partners in the catchment

CMAAs have the lead responsibility for preparing CAPs. However, both the development of a CAP and its implementation should be collaborative. To get wide buy-in to CAPs requires both a partnership approach in the development of the plan, and endorsement of the final plan. The final result should be that the CAP is ‘owned’ by all relevant organisations or sectors, and it should include targets and strategies that are beyond the scope of the CMA alone to implement. Ideally, the final CAP should document agreed roles and responsibilities at a strategic level for major partners and stakeholders to ensure effective implementation.

The planning process should consider the opportunities for ‘win wins’ from coordinated action, but also the potential risks where alignment or partnerships cannot be successfully negotiated.

#### 5.3.1 Summary of strengths and gaps against attribute 3C

The following table sets out what GHD found when reviewing the CAP and CAP planning process against attribute 3C.

**Table 12 Summary of strengths and gaps against attribute 3C**

Attribute	Outcomes from review of evidence
Plan specifies agreed roles and responsibilities for partners in the catchment	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>The CAP identifies roles for stakeholders through assigning stakeholders to actions associated with each theme</li> <li>Mechanisms to engage government, community and industry in CAP implementation and review are proposed</li> </ul> <p><b>Gaps:</b></p> <ul style="list-style-type: none"> <li>No specific gaps</li> </ul>

#### 5.3.2 Supporting evidence for attribute 3C

The Pilot Project Report [1] does not describe a process for prioritising agencies relevant to plan implementation or for identifying roles and responsibilities. However, the CAP [3] notes that: ‘identifying where partners may be interested and able to collaborate in delivering the CAP was a key goal in its development process. Collaboration and consultation has occurred within state government agencies, local governments and key stakeholder and community groups’ (p13). In particular, there has been detailed discussion with agencies around the feedback provided via the SOG which included negotiations around responsibilities [12].

**The CAP identifies stakeholders for involvement in CAP implementation, and against identified priority actions [3].** The list includes private landholders, public land managers, local government, a range of state government agencies, the CMA, community groups, research organisations, industry groups and associations, etc. The assessment of alignment with government plans and policies would likely have involved the consideration of synergies with the agencies responsible for the implementation of those plans and policies. While this is not made explicit, the development of benefits statements does go some way to demonstrating this consideration.



The CMA has made it clear the mandate and ability to implement the CAP and achieve the catchment targets is distributed amongst CMA, major partners and stakeholders. To assist CAP implementation the CMA intends to actively engage with major partners and stakeholders in meeting CAP targets [3]. The CMA will explore establishing **Whole of Government reference groups**. The CMA has set a goal of working with planning agencies to ensure the CAP is considered in their deliberations. They will also continue to engage the **Namoi Local Government Group** and Namoi Councils Group to facilitate and contribute to a regional plan for the Namoi [3]. Effort will also be made to engage the **resources sector** on thresholds, cumulative impact and risk management, given the impact of potential extractive industries [3].

Community engagement will be strengthened through establishment of **Community Reference Panels**, developing the resilience perspective at finer scales, and exploring methods for greater community input into investment planning and target prioritisation [3].

### **5.3.3 Conclusions for attribute 3C**

The CMA collaborated and consulted with the major stakeholders and partners to develop the upgraded CAP. This approach allowed the CMA and stakeholders to explore potential roles and responsibilities in an adaptive manner.

The CAP specifies roles for stakeholders against actions for each of the four themes. Consultation with major stakeholders during the finalisation of the CAP included, in some instances, discussion of roles and responsibilities for proposed actions. The actual roles and responsibilities will be determined during implementation.

The CAP also proposes that a series of government, local government and community reference groups be established to implement and adapt the CAP. These mechanisms should facilitate clarification of roles and responsibilities in CAP implementation.



## Appendix A

# References



## Materials reviewed as part of the assessment process

- [1] Namoi CAP 2010-2020: Namoi CAP Pilot Project Report
- [2] Namoi Catchment Action Plan 2010-2020 – Supplementary Document 1: The first step – preliminary resilience assessment of the Namoi Catchment. September 2011
- [3] Namoi Catchment Action Plan 2010-2020. September 2011
- [4] Stakeholder interviews (Namoi Local Government Group and Tamworth Regional Council, NSW Office of Water, the then Department of Environment, Climate Change and Water, Industry and Investment, NRM Senior Officers Group, DoP, Namoi Water, Namoi Aboriginal Advisory Committee and Landcare)
- [5] Interviews with CMA CAP planners, General Manager and Board Members
- [6] Expert knowledge and logic review – Nick Abel (Independent Consultant – resilience expert) and David May (GHD – Principal NRM Consultant)
- [7] Hard copy spreadsheet of ‘most critical thresholds’ provided at interview by Francesca Andreoni to NRC and GHD
- [8] Department of Planning correspondence to Department of Environment Climate Change and Water, February 2011, on pilot CAPs and review templates.
- [9] Pilot CAP updates – Agency Review and Recommendations (DRAFT), Natural Resource Management Senior Officers Group, 17 March 2011
- [10] 2010 Social Survey of Namoi CMA Stakeholders: Findings from ‘Access to Country’ group discussion, stakeholder depth-interviews and broad-scale telephone survey, Ipsos-Eureka Social Research Institute, 21<sup>st</sup> June 2010
- [11] NCMA Knowledge Products for completion – word document provided via email by Francesca Andreoni to Emily Ray, 25<sup>th</sup> March 2011
- [12] Namoi CMA negotiated responses to NRM Senior Officers Group feedback on Draft Namoi CAP, 5<sup>th</sup> September 2011
- [13] Namoi CMA – CAP Review Pilot Plan, 2010
- [14] Namoi CMA – CAP Review Consultation Plan Draft 2010



Appendix B  
**Interviews**



<b>Group or Organisation name (at time of interview)</b>	<b>Number of Interviewees</b>
Namoi CMA	5
Namoi Water	1
Liverpool Plains Land Management Inc	1
Landholder	1
Namoi Local Government Group and Tamworth Regional Council	1
NSW Office of Water	1
Namoi Aboriginal Advisory Committee and Landcare	1
Department of Primary Industries, Regional Services	1
Department of Climate Change and Environment	1
Department of Planning	1



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4	L Molony	E Ray		E Ray		13.10.11
5	J Reynolds	A Roy		A Roy		10.11.11
6	A Roy	E Ray		A Roy		25.11.11