



CLIENTS | PEOPLE | PERFORMANCE

Report for Natural Resources Commission

Review of evidence against NRC attributes Central West 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 Central West 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 Recommendation Report – Central West Upgraded Catchment Action Plan, which contains the NRC's assessment and recommendations on the Central West upgraded CAP.

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



This Report:

- *has been prepared by GHD Pty Ltd (“GHD”) for Natural Resources Commission;*
- *may only be used and relied on by Natural Resources Commission;*
- *must not be copied to, used by, or relied on by any person other than Natural Resources Commission without the prior written consent of GHD;*
- *may only be used for the purpose of Natural Resources Commission and must not be used for any other purpose.*

GHD and its servants, employees and officers otherwise expressly disclaim responsibility to any person other than Natural Resources Commission arising from or in connection with this Report.

To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the Report are excluded unless they are expressly stated to apply in this Report.

The services undertaken by GHD in connection with preparing this Report:

- *were limited to those specifically detailed in section 2 of this Report;*
- *did not include consultation with all stakeholders related to the Central West Catchment Action Plan.*

The opinions, conclusions and any recommendations in this Report are based on assumptions made by GHD when undertaking services and preparing the Report (“Assumptions”), including (but not limited to):

- *the views of interviewees are representative of wider stakeholder views*

GHD expressly disclaims responsibility for any error in, or omission from, this Report arising from or in connection with any of the Assumptions being incorrect.

Subject to the paragraphs in this section of the Report, the opinions, conclusions and any recommendations in this Report are based on conditions encountered and information reviewed at the time of preparation of this report. GHD has no responsibility or obligation to update this Report to account for events or changes occurring subsequent to the date that the Report was prepared.



Contents

1.	Introduction and executive summary	1
1.1	Background	1
1.2	Purpose of this review	1
1.3	Summary of the CAP's strengths and gaps against the attributes	1
1.4	Structure of this report	3
2.	Methodology	4
2.1	Collection of evidence and identification of strengths and gaps	4
2.2	Reporting	5
3.	Outcomes from a review of evidence against the attributes for criterion 1	6
3.1	Attribute 1A. Strategic planning	6
3.2	Attribute 1B. Engaging stakeholders	9
3.3	Attribute 1C. Adaptive planning	12
4.	Outcomes from a review of evidence against the attributes for criterion 2	16
4.1	Attribute 2A. Describing socio-ecological systems	16
4.2	Attribute 2B. Developing strategies for improving landscape function and resilience	20
4.3	Attribute 2C. Proposing targets and actions	23
5.	Outcomes from a review of evidence against the attributes for criterion 3	26
5.1	Attribute 3A. Policy and community alignment	26
5.2	Attribute 3B. Guiding governments, industry and the community to align effort across the region	29
5.3	Attribute 3C. Agreeing roles and responsibilities	32



Table Index

Table 1	Description of Criterion 1 and attributes	6
Table 2	Summary of strengths and gaps against attribute 1A	7
Table 3	Summary of strengths and gaps against attribute 1B	10
Table 4	Summary of strengths and gaps against attribute 1C	13
Table 5	Description of Criterion 2 attributes	16
Table 6	Summary of strengths and gaps against attribute 2A	17
Table 7	Summary of strengths and gaps against attribute 2B	21
Table 8	Summary of strengths and gaps against attribute 2C	24
Table 9	Description of Criterion 3 attributes	26
Table 10	Summary of strengths and gaps against attribute 3A	27
Table 11	Summary of strengths and gaps against attribute 3B	30
Table 12	Summary of strengths and gaps against attribute 3C	32

Appendices

Appendix A	References
Appendix B	Interviews



Acronyms used in this report

CAP	Catchment Action Plan
CEO	Chief Executive Officer
CMA	Catchment Management Authority
INFFER	Investment Framework for Environmental Resources
MERI	Monitoring, Evaluation, Reporting and Improvement
NRC	Natural Resources Commission
NRM	Natural Resource Management
SOG	Senior Officers Group



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 (August 2011)* 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 Central West upgraded CAP (August 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 Central West 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 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 nine documented stages incorporating scoping, data collecting, analysis, drafting and consultation. The processes used are clearly documented and were iteratively refined through the CAP upgrade. This provided a transparent basis to the CAP upgrade planning process and a sound foundation for future revisions. The revision process can be further strengthened by clearly outlining how alternative strategies for achieving catchment outcomes will be considered.

The CMA (board, management and staff) and key stakeholders were actively engaged in developing the upgraded CAP through a comprehensive and planned series of activities. This has resulted in a better understanding of the catchment and the purpose of the upgraded CAP as well as commitment to its objectives and implementation.

The upgraded CAP provides a framework for the adaptive management of the CAP. This integrates the use and review of thresholds of potential concern, state and transition models, program logics and targets, implementation performance, spatial mapping, and Monitoring, Evaluation, Reporting and Improvement (MERI).

The CMA is responsible for the associated review/check points. This could be strengthened by the CMA developing and agreeing with its partners and stakeholders when the CAP will be reviewed and how major partners and key stakeholders will be involved. As the Central West CAP is one of the first upgraded CAPs, this process is still being developed, but it is important that it is addressed to support effective ongoing adaptation of the CAP as knowledge improves or circumstances change.

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

The CAP uses 22 state and transition models, grouped into four themes, to describe the systems in the catchment. In addition key biophysical systems and their drivers (threats) are described for five catchment landscapes. The descriptions were systematically analysed to develop thresholds of concern and the CAP's goals, targets and priority actions using a suite of analytical tools including Investment Framework for Environmental Resources (INFFER), Resilience Thinking, program logic, expert workshops and spatial analysis. A comprehensive collation process (literature review and stakeholder consultation) was used to identify and review best available science and community values knowledge to support the analyses.

The plan contains a logical hierarchy of state-wide targets, catchment goals and management targets to address landscape function across four themes (community, biodiversity, water and land). These are linked to underlying priority actions based on the 22 state and transition models, program logics and spatial analysis. The catchment goals outline the strategic intent, while the management targets identify a realistic percentage of systems which the CMA believes it is able to maintain or move into a safe operating space over the next 10 years.

There is scope to strengthen the description and analysis of socio-ecological systems, catchment scale goals, key assets and priorities in subsequent revisions of the CAP. This could include improving the integration of the social, economic and ecological aspects of systems as part of adaptive implementation of the upgraded CAP.



Various intervention strategies to improve landscape function and resilience were considered through the planning process although summaries were not cited in the CAP and may not be explicitly documented. The adaptive capacity of the community and stakeholders was assessed during the planning process. There were challenges in determining thresholds of concern for the adaptive capacity. It may be better to consider adaptive capacity through the general resilience rather than the specific resilience frame. The CAP notes this as an area requiring further development.

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 which were key considerations in developing the upgraded CAP. Community aspirations were collected through the asset (INFFER) and resilience workshops. Key policies are noted in relevant sections of the CAP and further information is provided in the Support Document, particularly in the alignment logics. The CMA was active in seeking feedback on the draft CAP as well as individually with key stakeholders on particular issues to improve alignment. While some of the alignment logics are not complete, the CAP acknowledges this will be an on-going focus area during implementation.

The plan is easy to understand and interpret. The main body of the CAP focuses on targets, priority actions and the involvement of stakeholders, and is complemented by significant supplementary information in the Support Document. Overall the CAP provides stakeholders with a valuable range of information on targets, the catchment and its systems, and supporting (including spatial) analysis. Importantly the CAP and the process by which it was developed have created a platform for collaborative action and partnerships between the community, government and industry to align effort during implementation of the CAP.

The process for agreeing roles and responsibilities with major partners and key stakeholders is embedded in the stakeholder engagement undertaken during the upgraded CAP. This provided the CMA and stakeholders with a flexible process to explore the best way to structure roles and responsibilities.

The upgraded CAP specifies stakeholder involvement for priority actions. It is reasonable to assume that once the CAP is finalised, there is high level stakeholder agreement to be involved in these priority actions. The more detailed roles and responsibilities will need to be determined during implementation.

1.4 Structure of this report

This report presents GHD's summary of evidence regarding how the Central West 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.

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



2. Methodology

The Central West CAP was initially developed through a pilot process against a working draft of criteria and attributes¹. 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, Central West CMA updated the CAP, and sought further community feedback, before submitting its final draft CAP in August 2011.

GHD has collected evidence as to how the Central West 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 Central West 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, Aboriginal Reference Group 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.

¹ 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>Strengths:</p> <ul style="list-style-type: none"> • The CAP upgrade was a systematic project which implemented a comprehensive suite of logical steps and analyses. This provides a clear and sound basis for future adaptation of the CAP • The CMA board and staff were effectively engaged in the CAP upgrade process which built their capability regarding the CAP and catchment <p>Gaps:</p> <ul style="list-style-type: none"> • The range of possible future (including desired) catchment outcomes and alternative strategies considered during the planning process are not specifically explained in the CAP and Support Document

3.1.2 Supporting evidence for attribute 1A

The CAP upgrade was planned, managed and documented as a systematic project. The staged approach to the CAP upgrade is detailed in "Stages of CAP review summary table" [1]. This includes activities involving different parties, timing, expected outcomes and alignment with NRC upgrade objectives for each of the nine key stages of the review process:

1. CAP evaluation and review planning
2. INFFER Asset Identification workshops
3. Asset significance and threat analysis using INFFER
4. Endorsement by government agencies and NRM Senior Officers Group (SOG) of outcomes of asset significance and threat analysis
5. Identification of social-ecological processes, controlling variables and thresholds relating to assets and threats using Resilience Thinking
6. Development of CAP targets to maintain systems within threshold ranges
7. Endorsement by government agencies and Local Government on CAP targets at regional and NRM SOG level
8. Write draft CAP
9. Submit draft CAP to NRC.



Section 3 of the CAP Support Document [2] outlines the following **analyses** underpinning targets in the upgraded CAP:

1. Identification of natural assets using stakeholder workshops
2. Ranking of natural assets for investment using expert groups (INFFER)
3. Identification of issues for community resilience thinking (Resilience workshop round 1)
4. Theme-based grouping and prioritisation of natural assets for resilience thinking (Resilience workshop round 1)
5. Analysis of resilience on selected systems (Resilience workshop round 2)
6. Identification of potential thresholds to address key issues (Resilience workshop round 3)
7. General resilience thinking
8. Analysis of key systems at a catchment scale
9. Mapping and quantification process
10. Specification of catchment goals and quantification of management targets
11. Final stakeholder and community consultation.

The Support Document also describes in detail the other **evidence used** in the CAP upgrade project, including:

- Review of the 2006-2016 CAP (Section 2);
- Collation of available knowledge to specific evidence review questions (Section 4) and evidence to underpin the state and transition and program logic models (Section 3);
- The development of program logics, targets and supporting evidence (Section 4); and
- Determining the alignment of government plans and policies (Section 5).

The CAP upgrade **was supported by available evidence and rigorous analysis**. The upgrade was based on a resilience assessment approach described in Section 3, particularly the use of state and transition models to determine what drives a system from one state to another state. Section 3 of the Support Document describes the collation of evidence to underpin the state and transition and program logic models. Each state and transition model is accompanied by a table of sources and implied reliability of knowledge across four levels:

1. Experiential evidence;
2. Collation of internal documented evidence plus level 1 evidence;
3. Rapid literature search plus level 2 evidence; and
4. Comprehensive literature search and synthesis plus level 3 evidence.

The CAP and Support Document [2,3] **do not specifically explain the range of possible future (including desired) catchment outcomes** and alternative strategies to achieve these, that were considered during the planning process. Clearer documentation of these considerations would have further increased the transparency of the CAP and strengthened the justifications of the chosen goal, targets and priority actions.



The structured engagement of the CMA board and staff in the planning processes has built NRM and strategic capability within the CMA. The CMA board and staff reported a deeper understanding of the catchment (natural resources and socio-economic systems), critical issues, stakeholders' perspectives and planning tools (e.g. INFFER and Resilience Thinking). The application of this understanding and the tools has increased the planning skills of the CMA and the importance and ownership of the targets [5].

3.1.3 Conclusions for attribute 1A

The CMA planned and managed the CAP upgrade as a systematic project involving nine documented stages incorporating scoping, data collecting, analysis, drafting and consultation. The key analytical steps including asset review, resilience thinking, mapping, quantification and prioritisation were designed up front, implemented and documented. The processes used are clearly documented and were iteratively refined through the CAP upgrade. This provided a transparent basis to the CAP upgrade planning process and a sound foundation for future revisions. The revision process can be further strengthened by clearly outlining how alternative strategies for achieving catchment outcomes were considered.

The CMA board, management and staff were actively engaged in developing the upgraded CAP through a comprehensive and planned series of activities. This has resulted in a better understanding of the catchment and the purpose of the upgraded CAP as well as commitment to its objectives and implementation.

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 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>Strengths:</p> <ul style="list-style-type: none"> • Stakeholder engagement was planned and effectively implemented • The CMA was active in addressing feedback from stakeholders and communicating changes made • The planning process built strategic capability of those stakeholders involved <p>Gaps:</p> <ul style="list-style-type: none"> • The engagement plan did not explicitly set out how stakeholder expectations would be managed, although the CMA did effectively manage this through the planning process

3.2.2 Supporting evidence for attribute 1B

The pilot CAP upgrade process included a **planned approach to engaging major partners and stakeholders** from government, community and industry. Industry consultation was predominantly focused on the agricultural sector. The “Stages of CAP review summary table” [1] outlines who will be involved in each stage of the pilot CAP review process, against which activity, and when. The major partners and stakeholders engaged include:

- CMA Reference Groups (Aboriginal Reference Group, NRM Working Group, Local Government Reference Group);
- The National INFFER Team;
- Government – Department of Environment, Climate Change and Water, Department of Industry and Investment, Natural Resources Commission, NSW Office of Water, State Water, Roads and Traffic Authority, Land and Property Management Authority, Livestock Health and Pest Authorities, Department of State and Regional Development, Department of Planning, Local Government and Shires Association of NSW, Aboriginal Affairs, NRM Senior Officers Group, Department of Premier and Cabinet, and Treasury²;
- The Catchment community;
- Australian Government NSW NRM team;
- 16 Central West local councils; Regional Development Authorities (Orana and Central West); Orana Regional Organisation of Councils; Central West Organisation of Councils;
- NRM/Landcare Groups; and
- Local experts.

² Department names reflect those in place at the time the CMA prepared its “Stages of CAP review summary table”.



The partners and stakeholders were engaged in a series of activities throughout the planning process [1]:

- A series of 12 stakeholder workshops to identify the location and values of natural resource assets was held at a range of locations throughout the catchment and involved over 200 community members;
- Additional natural resource assets were identified with other key stakeholders such as Landcare groups and agencies;
- Expert groups were convened (separately) to prioritise systems/themes, identify issues for community resilience, and determine the issues for which resilience thinking would be applied;
- Workshops comprising the CMA, agency experts and the community developed systems understanding of priority issues in each theme, and later identified potential interventions to drive systems to desired states;
- The Support Document (Part 3, Figure 3) provides a breakdown of attendees at INFFER workshops (rural landholder/farmer, urban resident, local government, state government, Aboriginal representative, regional organisation, local community organisation and Landcare) and Part 3, Table 2, summarises the representation of different organisations (Aboriginal Reference Group, industry/agriculture, council / Regional Organisational Councils, government agencies, CMA, University of New England and the community) at each of the five resilience workshops;
- The CMA planners engaged at all levels of their major partners and stakeholders to ensure buy-in and advocacy; and
- The CMA exhibited the draft CAP and revisited key stakeholders and communities to explain the CAP and how the information they provided was used [5].

The plan does not explicitly describe managing the expectations of major partners and stakeholders throughout the CAP planning process. However the CMA has responded to stakeholders' expectations through the above activities, feedback which is documented in the Support Document, and correspondence to key stakeholders (for example [9, 11]).

A range of NSW government, local government and community stakeholders were interviewed around the meaningfulness of their engagement in the development of the plan. All reported their involvement to be highly meaningful and that the process successfully engaged people and created greater consensus. Those consulted report a feeling of genuine input and are happy with the output [4].

"I was very flattered to be invited to participate; it was very generous of them. It was very interesting to watch the whole process – very insightful to understand the CMA's budget constraints and how they work to use the budget most effectively" (landholder).

"The fact that the CMA invited local government to be a part of the process was an important recognition of the role local government plays in resource management and the human element of that, for example everyone pays rates" (local government representative).

"People other than CMA staff were involved in the development of the pilot CAP and were able to make suggestions etc. To have external people involved is a terrific thing – in the early days that was unheard of" (Landcare representative).

"Involvement in the pilot CAP upgrade significantly improved our understanding of what 'whole of government' catchment management means" (NSW government representative).



The extent of stakeholder involvement, as evidenced through the Support Document [2], interviews with stakeholders [4] and interviews with the CMA pilot CAP planners [5], is likely to have built NRM and strategic capability through experiential learning. Twenty-one agency staff were involved in writing parts of the pilot CAP and engagement of the community in resilience thinking in NRM as a concept was often reported [5].

Agency understanding of what a CAP is has changed as a result of their participation and positive experience. Agency engagement at the regional level was inconsistent through the CAP development phase. However, the persistence of the CMA, support of the Senior Officers Group, and collaboration with the Whole of Government coordinator and agencies means there is now a better understanding of CAPs, the update process, and what it is supposed to do. Both agencies and the CMA are getting a better understanding of what a Whole of Government approach to NRM means as a result of participating in the CAP upgrade. There has been a shift in attitude from the CAP being a 'bucket of money' through which to get agency priorities funded, to agency understanding of their role in contributing to the implementation of the CAP. The early and ongoing involvement of agencies, alongside the community, in CAP development led to this change in attitude. Strategic capability improvement is evident in the proposed government alignment project – the process has driven improvement across the agencies; *"It's a real two-way street"* [4].

3.2.3 Conclusions for attribute 1B

The CMA developed and implemented a plan which engaged stakeholders in developing the upgraded CAP. This includes major partners, key stakeholders and the wider public whose involvement is documented.

The planning process does not explicitly document how stakeholder expectations would be managed. However the CMA was responsive in addressing feedback, documenting the issues raised and how they were addressed. General feedback was publicly reported and communicated individually to major partners and key stakeholders.

The upgraded CAP development process built the strategic capability of stakeholders involved. This has resulted in a better understanding of the catchment and the purpose of the upgraded CAP as well as commitment to its objectives and implementation.

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>Strengths:</p> <ul style="list-style-type: none"> • The CAP upgrade process was informed by an independent review and other reviews of the previous CAP • The CAP, supporting documents and MERI plans establish a framework for future adaptive management of the CAP <p>Gaps:</p> <ul style="list-style-type: none"> • The CMA and partners still need to establish a governance framework outlining how the CMA, major partners and key stakeholders will be involved in ongoing adaptive management of the CAP

3.3.2 Supporting evidence for attribute 1C

The planning process was informed by an evaluation of the previous CAP and its implementation.

The Support Document [2] describes the review of the previous CAP in 2009, which was triggered by a 2008 analysis of the program logics for the CAP's eight themes that identified a number of issues with the current CAP.

The review was undertaken by external consultants, independently of the pilot project, the results of which are provided in Section 2, Appendix 2.1 [2]. The review focused on the performance of the CMA in meeting targets rather than how the CAP was implemented [2].

The review of the previous CAP included assessment of the CMA response to the findings of prior NRC audits. The review report is provided as Section 2 [2]. Utilisation of findings is outlined in Section 2 of the Support Document [2] and includes improvements in business systems, community engagement in resilience thinking and the application of INFFER, knowledge management (including the creation of an 'evidence library'), risk assessment, MERI and the resetting of spatial investment priorities.

The evaluation of the previous CAP and its implementation informed the planning processes in the following ways:

- Use of the evidence collation to inform both the INFFER and resilience assessment processes;
- Built on the CMA's existing relationships with agencies and within the catchment community to support engagement during the planning process, including in resilience thinking and the application of INFFER;
- Use of experience with delivery against current targets and the new evidence available to enable a realistic targets setting process;
- Use of risk assessment; and



- Resetting of spatial investment priorities.

The plan summarises a process for future adaptive management of the CAP, with a more detailed process provided in the Support Document [2]. The plan describes the three key parts of the CAP identified as requiring adaptive management as:

- Thresholds of potential concern;
- State and transition models; and
- Program logics - actions, management targets and catchment goals.

The plan describes that the state and transition models and program logics are underpinned by assumptions with varying confidence levels depending on the level of understanding and evidence to support that understanding. It describes how monitoring and evaluation will be utilised to improve that understanding and adjust the models and associated priority actions, and how the monitoring and evaluation will be prioritised.

A simple diagram (Figure 52 in the plan) demonstrates how the CMA will test its current understanding of the models and logics, learn from the evidence gained, and intends to improve its success through adaptive management.

The Support Document [2] describes how adaptive management of processes within socio-ecological systems (adapting state and transition models and program logic models) via improved understanding is specifically sought through:

- Gathering experiential evidence from experts;
- Collation of existing internal evidence;
- Rapid searches for relevant external scientific literature;
- Evidence review program (reviews of threatening processes, biophysical interventions, adoptability and delivery mechanisms); and
- Monitoring and evaluation for projects or CMA programs.

The Support Document [2] describes the revision of the CMA's current MERI program to ensure consistency with the CAP once the CAP is approved. Example revision actions include:

- MERI strategy reviewed to ensure it is still consistent with CMA drivers and revised CAP;
- Update Evidence Plan and evaluation schedule to ensure any questions raised from planning process can be analysed for prioritisation of evidence needs;
- Publish new logics for whole of catchment and interventions to assist project planning and investment cycle;
- Determine whether project charters and project review templates need to be updated;
- Review existing monitoring programs to ensure they are still consistent with CAP needs; and
- Ensure evaluation findings that are currently being undertaken will be considered by the CMA in terms of the relevant state and transition models.

The key elements of Figure 2 in the plan [3] (and Figure 1, Section 6 in the Support Document [2]) are **the basis of review/check points**. The MERI program, once updated, provides a key source of information to guide implementation, report performance and focus priorities for further investigation.



The CMA is responsible for the adaptation process and associated review/check points and MERI program implementation. The Annual Implementation Program will be a key element of future adaptive management since it defines what the CMA will actually implement during the coming year in collaboration with its partners.

However the upgraded CAP does not describe a schedule for when the CAP will be reviewed or the roles and responsibilities of major partners / key stakeholders in doing so. These points limit the transparency of the CAP's future adaptive management governance, even though it is implicit in the review activities and on-going planning and implementation described above. This is partially due to the fact that the CAP upgrade was a pilot process and that adaptive management governance arrangements with stakeholders are still being developed as the Whole of Government process evolves.

3.3.3 Conclusions for attribute 1C

The CMA commissioned an independent review of the previous CAP to inform the design of the CAP upgrade planning process including evidence collection, analytical frameworks and stakeholder engagement.

The upgraded CAP provides a framework for the adaptive management of the CAP. This integrates the use and review of thresholds of potential concern, state and transition models, program logics and targets, implementation performance, spatial mapping and MERI.

The CMA is responsible for the associated review/check points. This should be strengthened by the CMA developing and agreeing with its partners and stakeholders when the CAP will be reviewed and how major partners and key stakeholders will be involved. As the Central West CAP is one of the first upgraded CAPs, this process is still being developed, but it is important that it is addressed to support effective ongoing adaptation of the CAP as knowledge improves or circumstances change.



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.

This 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 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>Strengths:</p> <ul style="list-style-type: none"> • The CAP describes the catchment and landscape function in terms of inter-related systems • The CAP uses state and transition models to explain system states, drivers and thresholds • The CAP development involved comprehensive collection and use of evidence from multiple sources • The evidence review identified knowledge gaps that need to be addressed <p>Gaps:</p> <ul style="list-style-type: none"> • Appropriate evidence and tools for community analysis is a key (acknowledged) gap • There is an opportunity to strengthen analysis of linkages

4.1.2 Supporting evidence for attribute 2A

The CAP provides a **conceptual framework of the catchment's functions** that outlines how the systems and shocks interact at various scales (Figure 1, [3]) across the catchment, which is also described in the catchment overview [3]. **The catchment and landscape functions are further described in terms of 22 inter-related systems grouped under four themes;** community (5 systems), biodiversity (6 systems), water (5 systems) and land (6 systems). Each system is described by a state and transition model, explaining controlling variables, key drivers, alternate states and thresholds. In addition, the interactions between the systems are depicted for each of the **five catchment landscapes;** Northern Slopes, Southern Slopes, Tablelands, Western Plains, and Western Flood Plain Catchment Landscapes (see CAP figures 43, 45, 47, 49 and 51).

Each state and transition model is accompanied by a table of sources [2]. The evidence has also been used to underpin the program logics which describe the assumed effectiveness of delivery mechanisms and biophysical interventions. The evidence is linked to evidence review questions that test the assumptions about how and why actions are expected to lead to desired outcomes [2].



The CMA used a comprehensive collation process (literature review and stakeholder consultation) to identify, collate and review best available science and knowledge of community values to support its analysis.

The evidence collected is well-focused around the state and transition models and program logics, and is more than adequate in its coverage for the type of investments envisaged and the likely levels of funding. The state and transition models and program logics provide the rationale for information prioritisation and collection, which is a good model for planning. **The planning process demonstrates how knowledge was collected and managed to build an up-to-date, comprehensive knowledge base**, based on literature reviews and stakeholder consultation.

Knowledge collection and management began with a review of the previous CAP and continued with a **structured evidence review** process, based on literature reviews directly relevant to the program logic models. The outlined process describes the level of evidence collation that has been completed or is planned, and associated evidence reviews where applicable. Evidence was arranged into two categories [2]:

- Catchment wide resilience issues, e.g. habitat connectivity, threatened species and sustainable populations; and
- Specific resilience issues identified during the resilience planning workshops, under the themes of biodiversity, water, land and community.

Appendix 4.2 of the Support Document [2] provides an extensive bibliography (of over 100 pages) of the 'best available evidence identified by the review program'. It is organised by evidence review questions. In addition the CMA reviewed relevant government policies and programs which are documented in the Support Document [2].

The CMA also extensively **engaged with catchment stakeholders** (community, government and experts) to collate best available knowledge on the catchment and the community. This included the INFFER and Resilience Thinking workshops attended by community and government stakeholders as well as expert workshops (See Attribute 1B for further details).

The CAP demonstrates an understanding of the **important values** in the catchment. Resilience and INFFER assessments mapped the location of important natural resource assets, and the social, economic and biophysical values of those biophysical assets. This was done through community workshops throughout the catchment region and expert workshops [2]. An understanding of the big issues in the catchment is demonstrated through the description of **shocks** at the catchment scale that the CMA believes may impact on the region's overall resilience – policy, climate variability, governance, market forces, land-use planning, and invasive species and diseases [3].

The CAP demonstrates a general understanding of how social and ecological elements of the landscape fit together through the matrix of **key systems** in the Central West region. That matrix shows how key systems that have thresholds of concern are linked across scales (local/farm, sub-catchment, catchment, and state/national scales) and systems (social/community, economic, and biophysical/ecological systems) and identifies the shocks that may impact on those key systems and thresholds. It does not however describe the catchment in terms of these linkages.



Linkages and integration between the state and transition models are considered at thematic and landscape (sub-catchment/region) scales in the upgraded CAP. **Interdependencies** between each system are shown for the catchment goals and management targets for each theme, including catchment goal linkages with other themes. Priorities linked to thresholds of concern are tabled and mapped for five catchment landscapes (sub regional). This provides a spatial representation of interdependencies and focal points at a finer scale, forming the basis for further prioritisation during upgraded CAP implementation. At a catchment scale, goals and priorities are summarised in the upgraded CAP summary (pp 8-9, [3]) and key natural assets are summarised in the “Prioritisation of high risk local systems” (Figure 5, p98, [3]).

Specific knowledge gaps to be addressed formed part of the identified priority actions in the draft version of the CAP. Although neither the current CAP nor the Support Document [2] explicitly collate and outline knowledge gaps, these were documented in previous versions and are presumed to be available and will be used in the future.

An important knowledge gap is in understanding the social sub-system, in particular the likely response of resource users to CAP actions and investments [6]. The gap is acknowledged in the CAP and the CMA intends to keep developing and using knowledge in this area.

The CAP describes a risk management approach that assesses the confidence in the evidence currently available and the consequences of inaccurate understanding. This information is built into an evidence plan that identifies and prioritises the CMA’s most important information gaps. The CAP explains that the CMA has successfully used this approach to prioritise investment in monitoring and evaluation projects in the past and will continue to apply this approach as part of their evidence planning and evaluation scheduling within the MERI program [3].

There is scope to strengthen the description and analysis of socio-ecological systems, catchment scale goals, key assets and priorities in subsequent revisions of the CAP. This could include improving the integration of the social, economic and ecological aspects of systems. The CMA and its partners could also consider the strategic and operational implications of improved knowledge as they adaptively implement the upgraded CAP.

4.1.3 Conclusions for attribute 2A

The CAP uses 22 state and transition models, grouped into four themes, to describe the systems in the catchment. In addition key biophysical systems and their drivers (threats) are described for five catchment landscapes. This is based on the following analytical tools which were adapted and integrated to provide a systems based description of the catchment:

- INFFER – asset assessment based on ecological and community values;
- Resilience Thinking – state and transition models;
- Program logic – defining purpose and causal linkages for policies and interventions;
- Practices – literature review of potential practices which contribute to catchment outcomes; and
- Spatial analysis – distribution of drivers, assets and intervention at various scales to highlight linkages, overlaps and interdependencies.



The CMA used a comprehensive collation process (literature review and stakeholder consultation) to identify and review best available science and community values knowledge to support the analyses.

The overall description of the catchment through themes, state and transition models and landscapes is informative, and reflects the need to adapt multiple analytical tools. This could include improving the integration of the social, economic and ecological aspects of systems as part of adaptive implementation of the upgraded CAP.

There is scope to strengthen the description and analysis of socio-ecological systems, catchment scale goals, key assets and priorities in subsequent revisions of the CAP.

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>Strengths:</p> <ul style="list-style-type: none"> • Catchment function and resilience was analysed using a range of tools, including state and transition models, program logic and spatial analysis • The CAP analysis was informed by a comprehensive collation and review of multiple information sources, including evaluating the quality of the evidence and a consideration of knowledge gaps <p>Gaps:</p> <ul style="list-style-type: none"> • There is an opportunity to strengthen the consideration of various interventions to improve landscape function and resilience • The evidence for integration of community analysis is limited (this is an acknowledged gap)

4.2.2 Supporting evidence for attribute 2B

The CMA examined the resilience of a number of assets at a range of scales to enable the identification of assets of most concern where investment by government and community should be targeted. For each, this covered:

- Description of the asset;
- State and transition models for 17 biophysical systems;
- Drivers, controlling variables, thresholds and priority interventions for each model; and
- Evidence to support the model, including for factors that contribute to transition between several states [2].

The planning process also included the development of five state and transition models for the community theme with thresholds of potential concern including cultural knowledge, landholder and group NRM capacity, community adaptive capacity, farm viability, and industry viability. Analysis under the community theme was hampered by lack of data, workable analytical models and challenges in establishing measurable thresholds of concerns other than for farm viability. These challenges are acknowledged and flagged for further development during upgraded CAP implementation.

There are also opportunities to strengthen analysis at a Whole of Catchment scale during adaptive implementation of the upgraded CAP. This may include populating the conceptual model for the whole catchment (Figure 3, p21 [3]) as discussed above under Attribute 2A.

The planning process (and CAP) demonstrates the identification of variables, feedbacks and critical thresholds for maintaining assets, or asset components rather than linked socio-ecological systems, in a healthy state in the state and transition models. As such they provide a summary and guide on factors which, if addressed, provide the basis for alternative strategies.



It was apparent from the interviews that various interventions for improving landscape function and resilience were considered by the CMA and working groups during the upgraded CAP process. This was reported in the interviews through the discussions that had occurred during the planning process around scale, interdependencies and ability of industry, community and government stakeholders to act. However, records summarising these considerations or a specific analytical process were not cited.

There is an opportunity to strengthen the consideration of various interventions to improve landscape function and resilience in the adaptive management of the CAP. This could be based around using the prioritisation criteria outlined in the CAP (p97 [3]) to review the socio-ecological systems, catchment goals, management targets and priority actions in reviewing and implementing the CAP.

The planning process analysed community as one of the four key themes, identifying state and transition models for cultural, knowledge, landholder and group NRM capacity, community adaptive capacity, farm viability and industry viability. Controlling variables, drivers and priorities are described for each model. Thresholds are described as desired states for the models other than farm viability which has specific measures.

The Central West catchment community is described in the CAP as exhibiting many positive attributes that contribute to its general resilience. Its strong learning and development base and good leadership and trust between agencies and other organisations, with a history of innovation and development of new approaches, was provided as an example [3].

The models were analysed in order to develop a suite of priority actions which contribute to increasing the community's adaptive capacity, including participation, protection of values and knowledge, partnerships, skills development and support.

Overall the CAP analyses community adaptive capacity in order to determine a reasonable set of goals, targets and priority actions. The CMA faced challenges in acquiring rigorous and robust analytical tools and relevant information to support planning around adaptive capacity. This highlights the importance of continuing to focus on adaptive capacity.

4.2.3 Conclusions for attribute 2B

The CMA undertook a systematic analysis of available evidence to develop strategies for the Central West catchment. This included using state and transition models and asset-threat analysis across four themes and five catchment landscapes (sub-regions).

Various intervention strategies to improve landscape function and resilience were considered through the planning process although summaries were not cited and may not be explicitly documented. The adaptive capacity of the community and stakeholders was assessed during the planning process. There were challenges in determining thresholds of concern for the adaptive capacity. It may be better to consider adaptive capacity through the general resilience rather than the specific resilience frame. The CAP notes this as an area requiring further development.



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.³ 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 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.

³ Under s 20(1) (a) (b) of the Catchment Management Authorities Act 2003.



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>Strengths:</p> <ul style="list-style-type: none"> • The CAP's goals, targets and priorities are logically nested and grouped • Links to underlying evidence are clearly presented • The CAP establishes priority actions for building community adaptive capacity <p>Gaps:</p> <ul style="list-style-type: none"> • No specific gaps

4.3.2 Supporting evidence for attribute 2C

The CAP contains catchment goals and management targets to address landscape function across four themes (community, biodiversity, water and land) based on the underlying 22 state and transition models. The catchment goals outline the strategic intent, while the management targets identify a realistic percentage of systems which the CMA believes it is able to maintain or move into a safe operating space over the next 10 years.

The targets are nested in a logical hierarchy for each of the themes, demonstrating causal linkages between priority actions, management targets, catchment goals and state targets.

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 targets are **supported by program logics** developed from state and transition models. While assumptions for the program logics are not explicit in the CAP or Support Document, they are inherent in the state and transition models and the evidence underpinning the state and transition models, and program logics are provided. Confidence levels for the evidence are also provided [2].

The proposed targets are based on the analysis of the state and transition models. The targets have been determined based on an understanding of the drivers, key controlling variables and thresholds. Catchment goals reflect the desire to maintain or transform systems into a safe operating space to prevent the system from crossing a threshold of potential concern. Management targets represent an aggregate of all the Priority Actions and are based on a realistic percentage of systems which the CMA believes it is able to maintain or move into a safe operating space over the next 10 years.

The proposed targets were based on considerable dialogue and debate within the CMA and with major partners and stakeholders. Alternatives were considered during this process but are not explicitly documented.



The plan contains general strategies to enhance the ability of communities to deal with change. Community adaptive capacity is recognised in the CAP as a potential threshold of concern. The associated priority action is to ensure NRM decisions contribute to community adaptive capacity. This priority action is not explicitly cross-referenced in the program logic for catchment communities, but it is assumed that the following identified priority actions are strategies for enhancing community adaptive capacity:

- Developing sustainable partnerships and networks;
- Leadership, mentoring and peer support programs;
- Education and training opportunities; and
- Provide support for groups, land managers and NRM industry.

4.3.3 Conclusions for attribute 2C

The plan contains a logical hierarchy of state-wide targets, catchment goals and management targets to address landscape function across four themes (community, biodiversity, water and land). These are linked to underlying priority actions based on the 22 state and transition models, program logics and spatial analysis. The catchment goals outline the strategic intent, while the management targets identify a realistic percentage of systems which the CMA believes it is able to maintain or move into a safe operating space over the next 10 years.

The CMA assessed the adaptive capacity of the community as part of the planning process. Through this process it identified the priority actions and strategies for enhancing community adaptive capacity.



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">A. Plan aligns with relevant NRM policies and community aspirationsB. Plan can meaningfully guide governments, industry and the community to align effort across the regionC. Plan specifies agreed roles and responsibilities for partners in the catchment

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, 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 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.⁴

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>Strengths:</p> <ul style="list-style-type: none">NRM policies and community aspirations are identified and alignment with the CAP was analysed and describedThe CMA tested alignment through stakeholder consultation <p>Gaps:</p> <ul style="list-style-type: none">An overview of the degree of alignment achieved is not clearly documented

5.1.2 Supporting evidence for attribute 3A

The CMA identified which government policies, strategies and plans to target for alignment during the planning process. It did this through a review of those strategies and plans identified in the draft NSW NRM Strategy, NRC CAP upgrade guidance documentation and through consultation with government stakeholders (Section 5, page 2 of 26, [2]). It also identified additional plans and initiatives of relevance, such as the Local Government Environment Plans and the Water for Future Initiative. [2]. The CMA worked with the NSW government agencies to align the policies and plans at the objective or spatial scales where possible.

⁴ 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 CAP Support Document (Figure 1, Section 5) includes a generic alignment model to illustrate how alignment was reviewed and determined. Table 1, Section 5, of the Support Document [2] outlines the results from the CMA's initial review of all plans (categorised by biodiversity; water; soils; community knowledge, skills and engagement, across themes; and for each of these by national, state or regional plan) and covers: plan/policy title, status of plan/policy, where accessed, comments regarding alignment, agency responsible, and alignment activity required by CMA. The review results set out in Table 1 indicate that CAP alignment with most NRM policies/strategies is generally achieved at a strategic level with the CAP catchment goals drafted to either encompass or not be inconsistent with the goals of the NRM policies/strategies. The initial review also identified where the CMA should work with partners to enable deeper alignment, for example for land use planning.

The Support Documents describes the results of the alignment assessment. 'Alignment logics' are provided for alignment between the CAP and: water sharing plans, the NSW Draft Biodiversity Strategy, general biodiversity plans, general water and salinity national strategies, general water and salinity state strategies, regional water-based strategies, and regional land-based strategies [2]. For these priority plans and strategies the program logic format provides for the CAP to align at the management target and priority actions levels. The CAP is reported to be well-aligned with the Australian Government's Caring for Our Country national priorities [2, 11].

The Plan is highly aligned with community aspirations. The planning process saw community members identify where they believed important natural resource assets were located, and the social, economic and biophysical values of those assets, via 12 community workshops throughout the catchment region. Throughout the planning process, the CMA endeavoured to determine what the community values - from natural and cultural values to our community NRM groups [5]. The INFFER process gives priority to natural assets that are of high value to the community and government and are highly threatened or degraded. While there was biased representation among stakeholders at the CAP development workshops, the CMA also collects information on community values via random stratified surveys for their social atlas [5]. Polling of participants in the draft CAP community consultation phase showed 'incorporation of community values' was what the majority of participants liked about the CAP.

5.1.3 Conclusions for attribute 3A

The CMA collected evidence on NRM policies and community aspirations which were key considerations in developing the upgraded CAP. Community aspirations were collected through the asset (INFFER and resilience) workshops. Key policies are noted in relevant sections of the CAP and further information is provided in the Support Document, particularly in the alignment logics.

The CMA was active in seeking to align the CAP with relevant government NRM plans and strategies, including seeking feedback on the draft CAP as well as individually with key stakeholders on particular issues to improve alignment. While some of the alignment logics are not complete, the CAP acknowledges this will be an on-going focus area during implementation.



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 references.

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.⁵

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.⁶ It will also be particularly important to allow CMAs to influence implementation of the Carbon Farming Initiative and the National Wildlife Corridors Plan.

⁵ 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.

⁶ Hamstead, M (2010), op. cit.



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.

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>Strengths:</p> <ul style="list-style-type: none"> • The CAP is well structured and easy to follow • The range of targets, actions/roles, analysis and spatial information included in the CAP and Support Document provides a suite of resources to guide stakeholders • The draft CAP and the CAP development process has created the foundation for collaborative implementation between stakeholders <p>Gaps:</p> <ul style="list-style-type: none"> • Stakeholders may require spatial information accurate at finer scales to guide their efforts (acknowledged limitation)

5.2.2 Supporting evidence for attribute 3B

The main CAP document is clear, logical and easy to follow. The opening 'Catchment Action Plan in summary' section provides a simple and clear two page overview outline of state targets, catchment goals, management targets and priority actions across the four themes (community, biodiversity, water and land) [3]. This is followed by three sections providing relevant context on the catchment, CAP and the key concepts used. The concepts are then applied at a catchment, thematic and landscape scale to underpin the CAP's goals, targets and priority actions and adaptive management. Extensive use is made of diagrams, maps and examples to improve clarity and ease of use. The Support Document [2] provides well-structured comprehensive supplementary information on the planning process followed, analyses completed and evidence collated.

The clear structure of the upgraded CAP and comprehensive supporting material **provides a valuable resource to guide greater aligned NRM effort across the catchment** around goals/targets and priority actions developed in consultation with stakeholders.

The CMA extensively engaged with both government and community stakeholders through the planning process in order to improve understanding of NRM in the catchment and build support for the CAP and its implementation. This was partly in response to the previous CAP having little meaning to stakeholders due to ineffective engagement and the aspirational nature of catchment goals providing limited guidance.

These engagement actions have created a platform for collaborative action and partnerships between the community, government and industry to align effort during implementation of the CAP.



A range of stakeholders participating in the CAP development workshops made the following comments on the usefulness of the (then yet to be released) CAP for their 'community' in informing and guiding natural resource decision-making:

"It helps me understand what I can do on my property and how that fits into the broader context of the catchment. It helps me understand what is being targeted in the surrounding areas"

"It provides a great opportunity for us to work together. We are in the process of getting an MOU underway for future work"

"From a local government perspective, the CAP will be very important in guiding planning decisions. Areas at risk, for example, will be considered in planning and resource allocation decisions"

"The CAP will be a very important tool for the councils, and also for the Regional Organisation of Councils itself in terms of setting direction, seeking funding, reviewing water supply issues for urban centres, and for feasibility studies"

Landcare can see the value and benefit of the CAP, in terms of providing a platform for collaborative partnerships to improve the catchment. Landcare's involvement in the planning process played a significant role in creating a CAP that provides accessible guidance for landholders and Landcare groups to use in their community [4, 5].

The Aboriginal Reference Group welcomed the opportunity to contribute to the CAP development. They support cultural heritage and water as key themes in the CAP, which are important to Aboriginal communities. The inclusion of cultural heritage and water in the CAP will provide a key focal point for all stakeholders to address these themes in the catchment [4].

The CMA has actively engaged with NSW government agencies and responded to feedback received, describing where and how agency concerns or comments have been addressed. This included changes to, or the development of new, state and transition models [11]. This on-going engagement has contributed to not only refining the CAP, but also building individual agency and Whole of Government support [4,5].

The CAP provides a range of spatial representation of key assets, threats and priorities to inform the CAP and provide a resource to stakeholders. The CMA has been providing information (mapping) to local government for some time, separate to the CAP. The CMA is starting to influence strategic land-use planning decisions at the local government level.

Catchment scale maps show overall priorities for the catchment under the different broad themes of community, biodiversity, water and land, including high priority vegetation communities, rivers and wetlands, and soil landscape systems. For each of the five catchment landscapes (Tablelands, Southern Slopes, Northern Slopes, Western Floodplain and Western Plains) both a priority map and a graphic diagram representing the local scale biophysical systems and their key threats/drivers have been produced.



The maps have been developed based on the best available spatial knowledge at the time, and for planning purposes with a scale range of 1:100,000 to 1: 250,000. These provide suitable catchment and landscape maps for strategic planning and prioritisation. There is on-going demand for maps which are accurate at the property scale to assist planning organisations (Local Government and Department of Planning and Infrastructure), Landcare groups and landholders. The CMA has been active in providing maps at the best available scales to Local Government. The demand for maps highlights that spatial data at the appropriate scale will be integral to effective implementation of the CAP [3, 4, 5].

5.2.3 Conclusions for attribute 3B

The plan is easy to understand and interpret. The main body of the CAP focuses on targets, priority actions and the involvement of stakeholders, and is complemented by significant supplementary information in the form of a Support Document [2].

Overall the CAP provides stakeholders with a valuable range of information on targets, the catchment and its systems and supporting (including spatial) analysis. Importantly the CAP and the process by which it was developed have created a platform for collaborative action and partnerships between the community, government and industry to align effort during implementation of the CAP.

5.3 Attribute 3C. Agreeing roles and responsibilities

Plan specifies agreed roles and responsibilities for partners in the catchment

CMAs 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>Strengths:</p> <ul style="list-style-type: none"> • Embedding agreement on roles with stakeholders within the CAP planning process provided a sound and flexible approach • CAP specifies stakeholder involvement against priority actions <p>Gaps:</p> <ul style="list-style-type: none"> • CAP does not specify stakeholder roles in overall adaptive management of CAP



5.3.2 Supporting evidence for attribute 3C

The process for agreeing stakeholder roles and responsibilities is embedded in the stakeholder engagement undertaken during the CAP upgrade. The approach of working with stakeholders to diagnose the catchment and establish goals and targets allowed the CMA and stakeholders to collaboratively scope roles and responsibilities. This included assessing the alignment of government priorities to identify synergies with and between agencies' plans and policies.

Overall the CAP nominates stakeholders against each of the priority actions under the four key themes. Those who might be involved include an extensive range of government, industry and community stakeholders, and significant effort has been made to differentiate who might be involved for each set of priority actions.

It is reasonable to assume that there is major stakeholder support for priority actions nominated in the CAP given the strategic, non-binding intent of the priority actions and high levels of engagement during the CAP upgrade.

The CMA intends CAP implementation to be via joint programs with major partners, i.e. a partnership approach, rather than dividing the work between different agencies. This is particularly the case with the NSW Office of Water, and NSW National Parks and Wildlife Service. The CMA is focusing its effort on building and maintaining relationships to that effect [4].

The upgraded CAP does not actually specify how stakeholders will be involved in the overall adaptive management and implementation of the CAP (also identified in Attribute 1C). This can be addressed by developing a governance structure outlining how major partners and stakeholders will be involved in subsequent planning at a more operational level.

5.3.3 Conclusions for attribute 3C

The process for agreeing roles and responsibilities with major partners and key stakeholders is embedded in the stakeholder engagement undertaken during the upgraded CAP. This provided the CMA and stakeholders with a flexible process to explore the best way to structure roles and responsibilities.

The upgraded CAP specifies stakeholder involvement for priority actions. It is reasonable to assume that once the CAP is finalised, there is high level stakeholder agreement to be involved in these priority actions. The actual roles and responsibilities will need to be determined during implementation.

The upgraded CAP does not actually specify how stakeholders will be involved in the overall adaptive management and implementation of the CAP. This can be readily addressed by including the governance structure outlining how major partners and stakeholders will be involved.



Appendix A

References



Materials reviewed as part of the assessment process

- [1] Stages of pilot review summary table (Word document provided by Central West CMA during interview)
- [2] Central West Catchment Action Plan - Support Document, August 2011
- [3] Central West Catchment Action Plan 2011-2021 – August 2011
- [4] Stakeholder interviews (See Appendix B)
- [5] Interviews with CMA CAP planners and General Manager
- [6] Technical knowledge and logic review – Nick Abel (Independent Consultant – resilience expert) and David May (Principal Consultant in NRM, GHD)
- [7] Interviews with CMA Board members
- [8] Central West CMA MERI Plan
- [9] Various email correspondence between Natural Resources Commission and NSW Government Departments between November 2010 and February 2011
- [10] Pilot updates – Agency Review and Recommendations (DRAFT), Natural Resource Management Senior Officers Group, 17 March 2011
- [11] Central West letters to the NRC and Senior Officers Group 11 August 2011



Appendix B
Interviews



Group or Organisation name (at time of interview)	Number of Interviewees
Central West CMA	7
Central West Aboriginal Reference Group	1
Central West Regional Organisation of Councils	1
Coonabarabran Landcare, NRM Working Group member	1
Department of Environment, Climate Change and Water	3
Landholders	2
Macquarie 2100	1
Mid-Western Regional Council	1
NSW Office of Water	1



GHD

133 Castlereagh St Sydney NSW 2000


-

T: 2 9239 7100 F: 2 9239 7199 E: syndmail@ghd.com.au

© GHD 2011

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	JP van Moort			JP van Moort		26.8.11
2	JP van Moort			JP van Moort		7.09.11
3	JP van Moort	M Groth		E Ray		9.09.11
4	JP van Moort	M Groth		E Ray		14.09.11
5	J Reynolds	A Roy		A Roy		10.11.11
6	A Roy	E Ray		A Roy		25.11.11