7.0 CLARENCE ESTUARY SUSTAINABILITY ACTION PLAN

This Action Plan outlines proposed actions to support sustainable management of the Clarence estuary and its associated coastal floodplain. The plan recognises the excellent existing initiatives and achievements in estuary and floodplain planning and management in the Clarence, and proposes mechanisms to extend the influence, enhance the performance and strengthen the outcomes of those initiatives.

The Action Plan outlined below is presented in three stages. The first stage identifies the existing actions that should continue (or be enhanced) and new actions that should be initiated within two years of the plan being adopted by the Councils of the lower Clarence valley. This stage will be concerned with:

- establishing an ongoing management structure;
- continuing and finalising existing initiatives that provide the foundation for later actions;
- establishing important baseline studies for issues where insufficient information is currently available for sound management choices to be made; and
- commencing selected actions to address major threats to highly valued natural and community resources. These actions include revised approaches to statutory land use planning, to control the potential impacts of future development.

A number of the actions that are recommended to be initiated in Stage 1 have time frames that will extend into Stage 2. For instance, efforts to co-ordinate provisions in Local Environmental Plans should commence in the first stage of Plan implementation, but achieving a consistent planning framework for sensitive natural resources across all four local government areas is expected to take more than the initial two years. The management response in this instance will be modified by the implementation of PlanningNSW PlanFIRST regional strategies and the flow on effects of the regional strategy for Local Plans.

Stage 2 of the Action Plan identifies new actions that should be initiated within a three to five year time frame. These actions consolidate the actions from Stage 1, and introduce new management initiatives that require information from Stage 1. Major capital works and changes to on the ground management are included in Stage 2. It is proposed that the Estuary Management Plan will be formally reviewed after three years.

As with the transition from Stage 1 to Stage 2, some previously commenced actions have timeframes that continue into Stage 3. Stage 3 presents actions that should be scheduled for more than five years after the adoption of the plan. Some of these actions may be modified when the plan is reviewed. Stage 3 includes new actions to address lower priority issues, and ongoing actions such as monitoring and reporting that will provide long term accountability for responsible organisations.

7.1 HIGH PRIORITY AND ONGOING ACTIONS

Tables 7.1 to **7.4** summarise the actions for the first two years of implementation of the Estuary Management Plan. The actions are organised into the four strategic areas that were identified in **Section 3**:

- Managing uncertainty and implementation.
- Water cycle management.
- Managing threats to ecological values.
- Managing user interactions.

The tables provide information about why each action is important, who will be responsible for its implementation and which other organisations will be involved in implementation. The tables also note related actions, how progress will be measured, and provide a broad estimate of the capital and maintenance costs associated with the action. The tables show whether the action is currently funded, and how it could potentially be funded in the future.

Table 7.1 includes a large number of high priority new actions, because these actions will provide the framework for effective and systemic management of the estuary in the future. Natural resource management structures and strategies are currently evolving rapidly in the Clarence Valley, and the changes noted below reflect and support new, more streamlined and integrated arrangements.

Actions that relate to specific parts of the estuary and floodplain are shown on **Figure 7.1**.

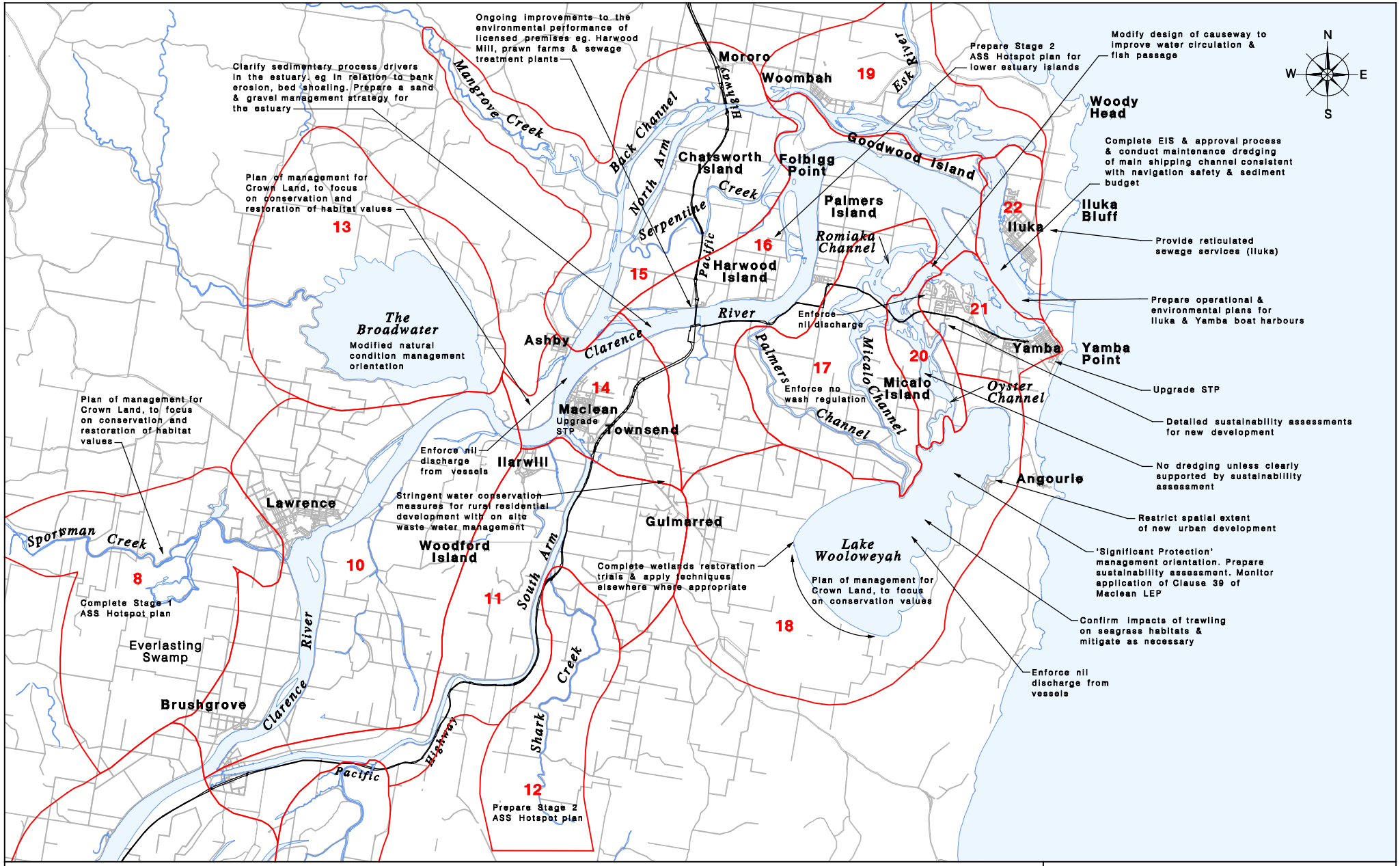
In **Tables 7.1** to **7.4**, "capital costs" means costs for works (including detailed design, construction and commissioning). Maintenance costs refers to costs for services, organisational management, education etc, which involve agency and Council staff time.

The costs estimates provided are indicative only, and will need to be thoroughly reviewed when detailed briefs are prepared for each action.

The cost categories for capital works and maintenance/extension activities are noted below. Note that there are different category boundaries for capital and maintenance costs.

Capital costs	Maintenance/extension costs (including staff time)
Low - less than $100,000	Low - less than $10,000
Medium - $100,000 to $500,000	Medium - $10,000 to $100,000
High - more than $500,000 (note that many capital works projects will require investment in excess of $1 million; these are referred to as very high costs)	High - more than $100,000

Actions noted as 'new' in **Tables 7.1** to **7.4** are new initiatives for sustainable management of the Clarence estuary and its coastal floodplain. Actions noted as 'ongoing' are those which enhance, modify or support an existing initiative. Often, for these actions, the Estuary Management Plan recommends review of strategic priorities based on an evaluation of systemic costs and benefits (as far as these can be determined from the available information). In all tables, "new" actions are presented first, followed by 'ongoing" actions that support or enhance existing initiatives. For continuity, action numbers relate to the action identification used in the Estuary Management Study.



Legend

Reach Boundaries

Note

This figure shows only actions relating to specific locations. Other actions applying to the whole estuary are noted in Tables 7.1 – 7.5.

0 2 4 8km

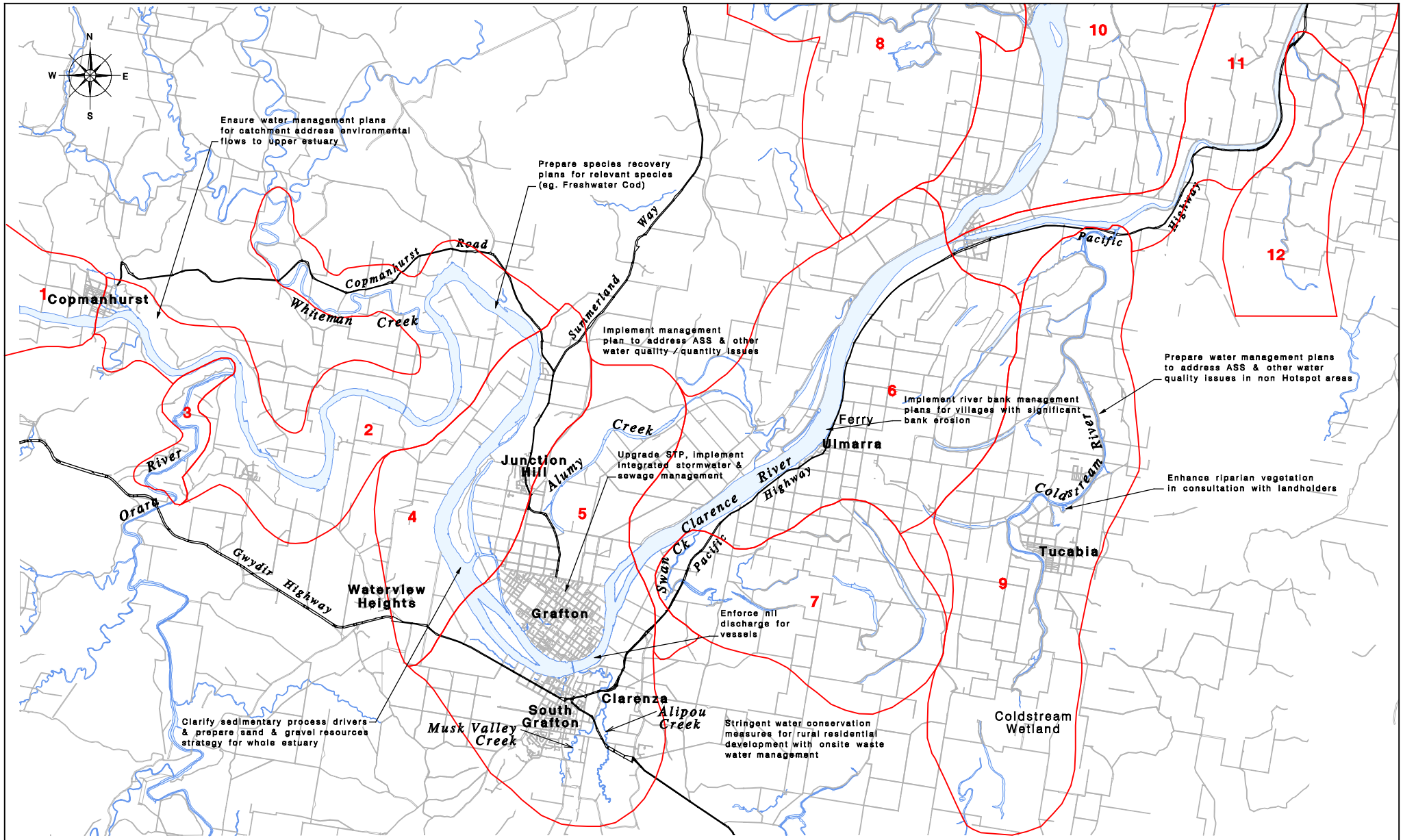
FIGURE 7.1a

High Priority and Ongoing Actions for specific localities

A3 Scale 1:120 000

Ref No.:R04_V1/1485_163.dgn

Umwelt (Australia) Pty Limited
Source: DLWC



Legend

Reach Boundaries

Note

This figure shows only actions relating to specific locations. Other actions applying to the whole estuary are noted in Tables 7.1 – 7.5.

0 2 4 8km

FIGURE 7.1b

High Priority and Ongoing Actions for specific localities

A3 Scale 1:120 000

Ref No.:R04_V1/1485_164.dgn

Umwelt (Australia) Pty Limited
Source: DLWC

Table 7.1 - Implementation and uncertainty - New actions for initiation in the first two years and continuing actions to support sustainable management

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated capital and maintenance costs	Funding sources
S1 (new)	Re-advertise positions on the Estuary Management and reappoint the committee as an implementation steering committee	Although some continuity of the committee responsible for plan preparation and the implementation and review phase is desirable, implementation may also require interests and skills that are outside the current management committee. A revised committee structure also provides opportunities to involve stakeholder groups who have not been involved at the committee level in the past, and to strengthen committee links to other natural resource management groups.	Protocols for selection of committee members and relationship of this groups to other natural resource management groups	Review of all committee membership structures and cross membership arrangements in the region, also S4 (below)	Combined local Councils	DLWC and other State agencies, UNCCMB, community and industry organisations	Capital – minimal Maintenance - low	Local Councils
S4 (new)	Formalise cross representation on Catchment Board, Water Management Committee and Estuary Management Committee by community, agencies and local government.	Although informal cross representation results in some information moving from one group to another, it is desirable in a context of rapid changes in natural resource management structures at he regional level, that robust connections between committees are in place, to enhance information transfer.	Clear justification for membership and cross membership and overall strategy for functions of committee members at different levels	As for S1, to include clear definition of roles of subcommittee or working groups members	UNCCMB	Estuary Management Committee, Water Management Committee, Vegetation management Committee, Clarence Floodplain Project etc	Capital – minimal Maintenance – low to medium	UNCCMB
S7 (new)	Formal agreement signed by heads of all major regional groups (Mayors, chairpersons and local members of Parliament). This agreement to be attached to the HRC sponsored Statement of Joint Intent.	This document makes a clear statement to the local community that Councils and state agencies are serious about working together to address management issues in the Clarence. It is an initial step towards accountability for actions in the Estuary Management Plan	Inter-Council agreement drafted and signed. Integration of Estuary Plan agreement with actions in the Floodplain Partnership Agreement.	This action gives the key estuary management actions for water, ecological and waterway usage government support	Local Councils	State and Federal members of Parliament, NSW Premiers Department	Capital – minimal Maintenance – medium (negotiation and review)	State agency budgets, local Council budgets

Table 7.1 - Implementation and uncertainty - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated capital and maintenance costs	Funding sources
S8 (new)	Develop and implement a formal partnership agreement between land holders, relevant state and local authorities and waterway users to provide integrated and effective management of the coastal floodplain. The forum group would prepare (in the first instance) an Integrated Water Cycle Planning Context Report for the Clarence estuary.	This is a major initiative that is being developed in the Clarence as an example of more accountable and certain management of natural resource issues. The intent is to provide a framework that delivers incentives for real on the ground action by landholders and also binds Councils and agencies to undertake certain tasks in a co-ordinated manner.	Consensus on which management/ implementation issues will be addressed by the Floodplain Partnership Agreement. Partnership agreement signed by key stakeholders is first milestone. Subsequently evidence of enhanced funding success (new funding initiatives) and actual on the ground implementation of new management strategies	This action is required by the State Government Statement of Intent. See also UNCCMB actions, and timeframe for producing a regionally relevant partnership (less than 12 months)	DLWC (UNCCMB)	CRCC, landholders, other state agencies, local Councils	Capital – minimal for the agreement itself, but the agreement will support other capital investment. Maintenance-medium (agency and community time)	DLWC (UNCCMB) in first instance
S10 (new) (See also W1)	A Water Cycle Management forum should be established to foster integrated water cycle management across the lower Clarence Valley. This group could operate as a subcommittee of the Water Management Committee	Although final funding decision for major regional capital works in water and sewerage infrastructure will be made at the State level, there are significant benefits in local Councils working together to make systemic decisions for the health of the estuary (eg put forward an integrated bid). There is also potential for management across the whole estuary to be more cost effective if Councils work together in this way.	Negotiation of systemic priorities for wastewater management and water supply management. Funding for implementation is based on these priorities	See Action W1. Builds on existing water efficiency groups established by North Coast Water	North Coast Water	All local Councils, EPA, DLWC	Capital – minimal Maintenance – medium (staff time for discussion, negotiation and development of integrated strategy)	North Coast Water and DLWC budgets

Table 7.1 - Implementation and uncertainty - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated capital and maintenance costs	Funding sources
S16 (new) (See also U19 and E5)	A consistent approach in Local Plans to the management of issues that clearly transcend local Council boundaries (eg vegetation management) in terms of studies and management plans required before consent or rezoning is granted. This consistent approach would also include appropriate protective zoning for high value aquatic, intertidal and floodplain habitats.	Much of the statutory power necessary for implementation of Estuary Management Plan actions will be provided through the Local Environment Plans of local Councils. Consistency between Councils in relation to major, systemic issues will provide more ecologically sustainable outcomes, and provide greater certainty for land users/developers.	LEPs provide clear whole of system performance criteria for natural resource values.	See Action U18 re sustainability assessments, U9 re stormwater management, and E5 re consistent regulatory/planning approaches to vegetation management. The new North Coast Regional Strategy by PlanningNSW will also be relevant.	Each local Council	PlanningNSW	Capital - minimal Maintenance - medium	Council budgets, PlanningNSW budgets
S18 (new)	Prepare a climate change risk assessment and response plan for the lower Clarence valley	Climate change can result in changes to rainfall and storminess patterns as well as increases in sea level that would affect tidal flushing and tidal velocities in the estuary. Potential impacts that need to be considered include those on infrastructure, but also on sensitive habitats such as salt marsh, mud flats for wader feeding and roosting, and potential changes to the hydrology of floodplain drainage and wetlands.	Availability of risk information to quality current management strategies and to identify the highest risk areas for changes to management approach	This action has the potential to affect a wide range of water management, sedimentary process and habitat management initiatives, including flood management and potential inundation of farm land by estuary waters.	DLWC	Local Councils, CRCC	Capital – minimal (for planning phase), capita costs for any response measures included with those actions. Maintenance costs (risk assessment and response preparation) medium	Contributions from DLWC, CRCC and local Councils

Table 7.1 - Implementation and uncertainty - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated capital and maintenance costs	Funding sources
S19 (new)	Ensure that the Catchment Blueprint gives appropriate recognition to the significance of estuary and floodplain management for systemic river health	It is anticipated that the Catchment Blueprint, which is a natural resource plan for the region, will be the basis on which NHT funds are allocated to priority activities. The Blueprint provides guidance about the relative importance of estuary and upper catchment issues for water system health. To maximise opportunities for access to grant funds, it is important that estuary issues are given appropriate recognition in the Blueprints (eg in relation to the relative importance of upper catchment and estuarine riparian vegetation restoration)	Estuary issues are clearly recognised and their priority confirmed in the Catchment Blueprint	See actions re cross representation and implementation responsibilities	Estuary Management Committee and all local Councils/ County Council	Local community, responsible State agencies (eg DLWC, NSW Fisheries, NPWS, Waterways Authority)	Capital – minimal Maintenance - low	DLWC
S2 (ongoing)	The Estuary Plan Implementation Committee should be jointly funded by all local authorities in the lower Clarence Valley	The intent of this action is to provide each local Council with a greater sense of ownership and responsibility for the Estuary Management Plan. It will also more equably share the cost burdens for administration across all the small Councils.	Agreement on the implementation management fund contributions from each local Council and how those funds will be managed	See S1 (reappoint Estuary Management Committee with new role)	Combined local Councils		Capital – minimal Maintenance - medium	Local Council budgets
S3 (ongoing)	The Estuary Management Committee should operate as a joint committee of all lower Clarence LGAs. Whilst Council amalgamations are not being specifically promoted, decisions about estuary management do need to be made across local government boundaries	The benefits of this action are similar to those of the Water Management Forum. Four general purpose Councils and two County Councils share management responsibility in the lower Clarence Valley. However, from a natural resource management perspective, it is not sensible to carve the estuary and floodplain up into small administrative units.	Estuary Management process demonstrates that priorities have been set on the basis of systemic criteria rather than local scale concerns alone.	Actions to clarify and formalise the relationship between the Estuary Management Committee and other natural resource management institutional arrangements	Combined local Councils	Other community stakeholders	Capital – minimal Maintenance- low to medium (planning for co-ordination)	Council budgets

Table 7.1 - Implementation and uncertainty - Actions for the first two years and ongoing actions to support effective management (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated capital and maintenance costs	Funding sources
S5 (ongoing)	Estuary Plan Implementation Committee to oversee implementation of certain actions from the Estuary Management Plan, plus provide a forum for discussion of emerging management issues, new technical information etc	This action describes the future role of the Estuary Management Committee. The Estuary Management Plan addresses some waterway usage issues that are outside the scope of other related management plans. Recreational and commercial boating/shipping and maintenance of breakwall structures are examples. Actions in relation to these issues could be supervised and monitored by the Estuary Management Committee.	Meeting minutes demonstrate committee role in information sharing, plus review of progress in implementation of actions for which the committee is responsible	Other actions will be driven by the UNCCMB or the Water Management Committee and the CRCC (in its current or modified form). See also S1, S2, S3.	Combined local Councils	State agencies, industry and community representatives on the Committee	Capital cost - minimal. Maintenance cost - medium.	Local Councils
S9 (ongoing)	The local Aboriginal community should be encouraged to participate and preferably should be represented by at least one person on each natural resource committee/board	Indigenous Australians have strong interests in the management of coastal waterways, from cultural, social and economic perspectives. However, there may also be cultural constraints to their effective participation in the management process, which need attention.	Regular participation of the Aboriginal community representatives in the regional planning process	See also actions in relation to the Indigenous Fishery Strategy and preparation of Aboriginal cultural heritage management Plans. Councils and agencies should also consider NPWS Guidelines for consultation with Aboriginal communities and support mechanisms that may be necessary to facilitate their participation	Aboriginal Community (Land Councils in the first instance) and elders groups	UNCCMB, all natural resource committees, DLWC	Capital – minimal Maintenance - low	UNCCMB and Council budgets

Table 7.1 - Implementation and uncertainty - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated capital and maintenance costs	Funding sources
S11 (ongoing)	The estuary committee should provide advice to the Catchment Board in relation to estuary and catchment wide monitoring of estuary health, rather than a narrower water quality monitoring program (potential indicators are noted in the Estuary Management Study)	Detailed monitoring of water quality parameters at a scale that can be meaningfully interpreted is expensive and is not necessarily the best mechanism to identify trends in sustainability outcomes for the estuary, floodplain and the local community. A broader set of indicators is desirable, and these should be reported for the whole system.	With UNCCMB, define appropriate indicators and monitoring procedures. Regular communication about appropriate indicators, plus other community information	The monitoring of catchment and estuary health should be co-ordinated by the UNCCMB, taking into account the advice from the estuary, floodplain and water management committees and their plans	Estuary Plan Implementation Committee	UNCCMB, other regional Natural Resource Committees, local Councils	Capital costs likely to be low (unless new data loggers required). Maintenance costs (staff time) potentially high, but shared across several organisations.	UNCCMB funds, local government and agencies. Some community contributions are also feasible (eg NSW Wader Studies Group).
S12 (ongoing)	Prepare and distribute community information about estuary management, co-ordinate estuary information that is distributed by other organisations (extension advice and monitoring results)	The ready accessibility of quality information and advice is essential for local communities to provide informed advice about management objectives, and appropriate management actions, and for them to manage their own activities in an environmentally sound manner.	Community feedback on the usefulness of information provided, linked to future surveys of community awareness and understanding of key issues	Community awareness programs developed by UNCCMB, DLWC, NSW Agriculture (ASSPRO) and by Councils in relation to vegetation management, ASS, stormwater etc	Estuary Plan Implementation Committee	Other organisations responsible for preparation and distribution of awareness and training material	Capital – minimal Maintenance - medium	Council and agency budgets, ASSPRO, NHT
S13 (ongoing)	The Estuary Management Committee will provide the UNCCMB with advice about priority locations for actions within the estuarine reaches of the catchment, clarifying broad UNCCMB strategies (eg in relation to weed control, riparian vegetation, cultural heritage) (see W, E and U Actions for immediate advice in this regard)	Essential for effective integration of management, with the estuary committee providing detailed advice within broader systemic priorities set by the UNCCMB	Detailed studies prepared as necessary to ensure quality advice on priority locations for action	See actions re habitat values of the floodplain and riparian vegetation, Crown Land Plans of Management, and Aboriginal heritage studies	Estuary Plan Implementation Committee will supervise necessary studies and report results to UNCCMB	NSW Wader Studies group and other specialist community groups	Capital for communication process – minimal. Capital for other studies is included against those actions. Maintenance – low to medium.	Local Councils and County Councils. Funds for specific projects from DLWC estuary programs, NHT, ASSPRO, CASSP, etc.

Table 7.1 - Implementation and uncertainty - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated capital and maintenance costs	Funding sources
S14 (ongoing)	The Estuary Management Committee will prepare an annual report on actions and progress in relation to sustainable management of the estuary. This report will be incorporated into the Annual report of the UNCCMB and will be readily available to the community	This is part of the accountability process for the Estuary Management Plan.	Annual reports that provide information about the status of actions and indicators where possible) are prepared and incorporated into a regional natural resource annual report.	This information will also be relevant to Council SoE reports, and will be essential for Action S15, plus local reviews of progress for adaptive management decisions	Estuary Plan Implementation Committee to supervise report preparation, potentially by a combined local government working group	UNCCMB, State agencies and industry/ community representatives	Capital – Minimal Maintenance - medium	Local Councils and County Councils
S15 (ongoing)	The Healthy Rivers Commission will audit performance on actions included in the State government's Statement of Intent	This review is intended to provide a systemic perspective on sustainable management. The Statement of Intent sets out the actions, outcomes and time frames for specific actions deriving from the HRC's recommendations	Review report prepared and amended action plan prepared in response	See S14, and Council SoE reports for integrated review and reporting	HRC	State agencies	Capital – minimal. Maintenance - medium	State Government (HRC)

Table 7.2 - Water Cycle Management - New actions for initiation in the first two years and continuing actions to support sustainable management

Action ID	Action	Why this action is beneficial	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated cost	Sources of funds
W1 (new) (see also S10)	Establish a water cycle management forum – water and wastewater management priorities at a catchment and estuary scale. Note this action is also listed in relation to integrated management. The forum group will prepare (in the first instance) an Integrated Water Cycle Planning Context Report for the Clarence estuary.	Although final funding decision for major regional capital works in water and sewerage infrastructure will be made at the State level, there are significant benefits in local Councils working together to make systemic decisions for the health of the estuary (eg put forward an integrated bid). There is also potential for management across the whole estuary to be more cost effective if Councils work together in this way.	Initially, that the forum is established, with all Councils willing to participate. Subsequent performance will be measured by sustainability of decisions in relation to water management	This action builds on the existing water efficiency subcommittee of North Coast Water. Also related to requirements for water efficiency in new development, water sensitive design and priorities for wastewater treatment plant upgrades and changes to wastewater disposal options	North Coast Water	DLWC, EPA, NPWS, all local Councils	Capital costs for forum is minimal. Maintenance cost medium for staff involvement and negotiation of strategic priorities.	North Coast Water and DLWC
W2 (new)	Implement a water demand reduction Strategy across the entire Clarence Valley	North Coast Water has made considerable progress in this regard, and has a strategy to manage demand for potable water. This action supports the implementation of the strategy. Demand reduction reduces the costs of infrastructure (both water supply and wastewater management), as well as benefiting aquatic ecosystems (particularly in dry periods)	As above, with particular reference to systemic priorities for management of water supply	Water sensitive design requirements for new development, wastewater and stormwater management. See also consistent LEP provisions across all Council areas. Also Water Management Plans for major tributary systems and water supply catchments that determine fresh water environmental flows into the upper reaches of the estuary.	North Coast Water	All local Councils, DLWC, EPA, local community, Water Management Committee	Capital cost – minimal Maintenance cost – high, with actual costs dependent on extent of incentives provided to accelerate adoption (eg information or subsidies for devices)	North Coast Water, with assistance from DLWC
W3 (new)	Accelerate the provision of sewage services to Iluka	Iluka's population of 2000+ is served by on site effluent management. Iluka is the largest unsewered settlement in the lower Clarence. Although Iluka Bay is better flushed than upstream reaches of the estuary, on site effluent management presents risks to groundwater quality and to near shore water quality.	Potential for groundwater contamination and effluent discharges to the estuary is removed	Short term actions to minimise the risks of off site impacts of on site effluent management	Maclean Council	DLWC, EPA, NSW Fisheries, landholders/residents	Capital – very high Maintenance – high to medium	Maclean Council and DLWC sewerage scheme funds

Table 7.2 - Water Cycle Management - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is beneficial	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated cost	Sources of funds
W9 (new)	Urban growth in the catchment of Lake Wooloweyah should be confined to the existing zoned area, unless a sustainability assessment (see HRC coastal Lakes Report) clearly shows that limited further growth is sustainable in terms of lake health)	Lake Wooloweyah is identified as a waterway to be managed for significant protection (HRC 2002). This includes restoration and preservation of critical natural processes, and potentially maintaining existing villages within current boundaries of developed areas	Measures of natural values maintained – seagrass health, nutrient levels in the lake.	Closely related to W10, and to actions re preparation of sustainability assessments. Note The Broadwater is in the Healthy Modified Conditions category	Maclean Council	PlanningNSW, HRC, local residents	Capital – low Maintenance – medium for planning costs	Maclean Council, with contributions from potential developers.
W13 (new)	Modify the design of the Micalo/Shallow channel causeway to enhance water exchange with the main estuary	The existing causeway design blocks water exchange into these sensitive channels, and also restricts fish passage. Modification to reinstate tidal ventilation will greatly enhance the health of the channels and would also benefit Lake Wooloweyah.	Interim achievements re design and installation, with ongoing assessment of improved water quality, fish passage and fish population or diversity	Actions re dredging of these channels, and management of fishery activities in Lake Wooloweyah, control of boat speeds and discharges. Clarence Floodplain Project and Partnership Agreement re systemic priorities associated with this action.	Maclean Council	CRCC, DLWC, NSW Fisheries, commercial and recreational fishers, local residents	Capital – high (actual costs depends on detailed design) Maintenance costs - medium	New funds needed
W16 (new)	Complete the current trial wetland restoration at Lake Wooloweyah (Estuary Management Program and ASSPRO) and consider implications for management in other parts of the Clarence Floodplain	The Lake Wooloweyah project has identified mechanisms which encourage landholders on low lying ASS risk grazing lands to implement alternative water management strategies, restoring estuarine wetlands.	Agreements reached with landholders about property plans, incentives and statutory requirements addressed. Subsequently, this project should lead to wider implementation of local agreements to modify drainage regimes - to be included in the Floodplain Partnership Agreement.	See other actions re Lake Wooloweyah, development of Floodplain Partnership Agreements. CRCC has prepared a Management Plan for Lake Wooloweyah.	CRCC	Landholders, NSW Agriculture, NSW Fisheries, NPWS, commercial and recreational fishers, PlanningNSW (re SEPP 14) DLWC (re Crown Land), landholders	Capital – moderate Maintenance moderate	Innovative funding arrangements to be developed in association with agreements, extended through Floodplain Partnership Agreement.

Table 7.2 - Water Cycle Management - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is beneficial	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated cost	Sources of funds
W20 (new)	Complete and implement Hotspot management plans for high risk ASS subcatchments (Hotspots Program) – Stage 1 in the first instance, and Stage 2. These plans will address firstly the lower estuary floodplain and islands, Everlasting Swamp and Shark Creek.	This is a critical action for the health of the Clarence estuary. CASSP funding for these projects, together with support from DLWC, Councils and the ASSPRO program provides major opportunities to reduce the risks of acid discharge from these subcatchments.	Water Management Plans (for Stage 1 these will be simply Hotspot Plans), completed and signed off by the Minister as necessary for Everlasting Swamp (Sportsmans Creek). Subsequent Water Management Plans (see Actions W26 and W27) will address non Hotspot ASS areas, and other estuary/floodplain water management issues.	See W26 re plans for high risk non hotspot areas, also partnership agreements for implementation	DLWC	NSW Agriculture, land holders, CASSP, NSW Fisheries, NPWS, local government (CRCC)	Capital – high Maintenance - medium	Mostly DLWC Hotspot Program, supplemented by funding from other sources eg CASSP, potentially also ASSPRO investment in implementation
W21 (new)	Clarify sedimentary process drivers in the estuary – further modelling of effects of structural controls on estuary hydrodynamics, sediment transport and erosion distribution, potential impacts of sea level rise, high and low risk areas for dredging.	This is critical information for long term risk management re bank erosion, sedimentation and dredging in the estuary	Model prepared that illustrates current situation and possible scenarios, including changes with possible SL rise.	See also U5 and U6 re EIS for dredging shipping channel, and actions re restoration of riparian vegetation, management of Crown Lands	DLWC	Maclean Council, Grafton Council etc, Port Authority, Waterway users, dredging contractors and construction industry	Capital medium for development of the model, Maintenance medium – refining model	DLWC estuary program
W26 (new)	Complete and implement plans to address ASS and other serious water quality issues in high risk subcatchments not listed under state 1 or 2 of the Hotspots program. Alumy Creek should be included in this action as a priority area.	This action complements W20 (above). Not all the high risk ASS lands are included in the Hotspots program. This action is intended to fill the gaps so that acid events across the whole estuary are reduced in frequency and intensity. These water management plans will also reduce the risk of other poor water quality events (such as low DO) which result in fish kills etc.	Overall, this action and W20 should result in significant improvements in water quality in the estuary and in floodplain channels. Initial indicators will relate to organisation of local management groups, preparation of plans	See W20, W16, S8 (Floodplain Partnership Agreement). Alumy Creek Plan has been prepared, so implementation of key aspects of this plan should be facilitated (see U8).	CRCC	DLWC, landholders, NSW Agriculture, NSW Fisheries, NPWS, commercial and recreational fishers (see Clarence Floodplain Project) State Weir Review Committee	Capital cost – moderate to high, depending on the degree of structural modification required. Maintenance costs – medium to high, for management of awareness and education activities, landholder groups organisation, plan making	See also W16 and S8 re innovative funding arrangements reinforced by the Floodplain Partnership Agreement

Table 7.2 - Water Cycle Management - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is beneficial	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated cost	Sources of funds
W7 (ongoing)	No new urban or rural residential subdivisions should be approved in areas with reticulated water unless they are also serviced by reticulated sewage services (or other approved water sensitive effluent management). Iluka is a key example here, as is Lawrence. Rigorous water conservation measures for existing rural residential development that has reticulated water but on-site sewage management Water conservation devices mandatory in areas with no reticulated sewage (or other approved water sensitive wastewater management)	The aim of this action is to encourage efficient water use, and also to reduce loads on on-site effluent management systems, so that discharges to local streams and ground water are a low risk.	Incorporation of water and wastewater management requirements into LEPs across all LGAs, rate of uptake of water conservation measures, and resulting affects on water demand	Se also W1, W2 and actions re provision of upgraded sewerage services, and demand management for water use.	All Local Councils	PlanningNSW, North Coast Water, DLWC, EPA, local residents	Capital - low Maintenance – medium for plan development and guidance	Council budgets
W11 (ongoing)	Enforce no discharge of sewage or bilge water from boats in Lake Wooloweyah, Shallow Channel, Oyster Channel and Palmers Channel	See HRC 2002 re management of coastal lakes for "significant protection"	Compliance of water quality with relevant objectives in confined lakes/channels with poor circulation	See also actions re restrictions on development, and on boat speed and wakes in these areas. Also changes to Micalo causeway to improve water exchange	NSW Waterways	Waterway users	Capital – minimal Maintenance – low to medium (staff time)	NSW Waterways budget
W12 (ongoing)	Other reaches to enforce nil discharge requirements for vessels are Maclean (adjacent to urban area), Yamba Bay, Grafton (whole reach), canal estates and Iluka Bay	These areas are all either used for primary contact recreation and/or have poor circulation and/or heavy boat traffic. Ecological and human health risks are therefore highest in these areas.	Water quality in these areas meets primary contact criteria	See also U20 re preparation of management plans for marinas, and actions re stormwater management	Waterways Authority	Maclean Council, Grafton Council, waterway users	Capital costs minimal Maintenance costs –low to medium re staff time for education and enforcement activity	NSW Waterways budget

Table 7.2 - Water Cycle Management - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is beneficial	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated cost	Sources of funds
W14 (ongoing)	No dredging of Shallow, Oyster or Micalo Channel should be permitted without a detailed environmental risk assessment that demonstrates that the dredging is a sustainable solution	These channels provide high quality habitat, which may be detrimentally impacted by dredging. Bank stability may also be affected, both by dredging and by boat traffic in deeper water.	Preparation of risk/sustainability assessments for any dredging proposal	See also W13 re modification of causeway, and actions re boat passage. See also W21 re sedimentary process drivers.	DLWC, Maclean Council	NSW Fisheries, Waterways Authority, Dredging contractors and construction industry, waterway users, residents	Capital costs minimal, Maintenance costs (assessment of alternatives, sustainability assessments medium)	Council budgets. Assessments to be paid for by proponents.
W23 (ongoing)	Implement strategic river health monitoring and reporting	This action is part of the accountability and adaptive management components of the Estuary Management Plan. It will complement information about progress in action implementation by providing information about trends in system health. Local estuary health reporting will be linked to the NSW State of the Rivers and State of the Estuaries reporting (DLWC)	Monitoring provides trends and indications of estuary health (systemic), as well as specific due diligence data for selected locations (eg designated swimming areas)	See also actions S11 - S14 re annual review and reporting of progress. Indicators likely to include aquatic and riparian vegetation, wader bird numbers, etc. See also auditing and partnership actions, both of which may be relevant to this work.	UNCCMB (to co-ordinate local reporting) Links to State level reporting – DLWC, EPA	Local Councils (Local State of the Environment Reports), CRCC, community, NSW Fisheries.	Capital – low to moderate (potentially new data loggers in selected areas, and new aerial photo runs to monitor vegetation characteristics)	UNCCMB – NHT options?, with contributions from local government
W24 (ongoing)	Provide community information to enhance awareness and understanding of water cycle management issues	See actions S11 - S14	Feedback and survey of general level of community awareness and adoption of water sensitive management practices	See actions W7, W8 requiring community adoption of new techniques and domestic water management strategies, also Actions W11, W12 re boat effluent	DLWC	Local Councils, North Coast Water, CRCC, EPA, residents, NSW Waterways, EPA	Capital cost – minimal Maintenance cost low to medium	Within DLWC budget

Table 7.2 - Water Cycle Management - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is beneficial	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated cost	Sources of funds
W25 (ongoing)	Ongoing improvement of the environmental performance of licensed industries/facilities such as the Harwood Mill, prawn aquaculture and STPs, by use of Environmental Improvement Programs attached as licence conditions	There are only a small number of premises in the lower Clarence valley licensed under POEO to regulate discharges to waters. Discharges from these premises can affect low flow water quality, wetland health etc.	Full licence compliance and any required Environmental Improvement Plans completed on time. Compliance with industry best practice guidelines/ strategies (eg Aquaculture Strategy)		EPA	Harwood Mill, Aquaculture enterprises, STPs operated by Councils, community, NSW Fisheries	Capital costs for compliance assessment minimal, but capital investment may be required for improved performance (particularly re STPs). Maintenance costs – low – agency time	Within EPA budget for compliance review. Operator funded upgrades of industrial premises and aquaculture farm as necessary. Industry funds and DLWC small towns sewerage scheme will contribute to any capital upgrades of STPs.

Table 7.3 - Threats to Ecological Values - New actions for initiation in the first two years and continuing actions to support sustainable management

Action ID	Action	Why this action is important	Accountability	Related actions	Who is responsible	Other stakeholders	Estimated costs	Funding sources
E1 (new)	Undertake a comprehensive assessment of estuarine and floodplain vegetation and habitats, including an assessment of waterbirds and other aquatic fauna and their habitats, to clarify the highest conservation value localities, potential corridors etc – possibly use Stream Health assessment methodology (see Catchment Blueprint)	Poor information is currently available at a systemic scale to underpin strategic management of habitat protection and enhancement. This action will define high value aquatic, intertidal, riparian and floodplain habitats. The Clarence estuary and floodplain provide important habitat for a high diversity of threatened and/or migratory and resident waterbirds and other protected fauna. The significance of the area for fauna, in particular waterbirds, warrants a targeted survey to provide essential information for the management of species and habitats.	Vegetation and habitat information available at the scale of individual reaches. Note this action could be staged, with priority given to reaches with more natural vegetation (ie to support protection of quality reaches)	See E2, E3, E4, E5, E24, all of which relate to protection and restoration of conservation values.	DLWC	Regional Vegetation Management Committee, Local Councils, CRCC, NPWS	Capital cost – minimal Maintenance cost – high mapping and documentation.	NHT
E24 (new)	Assess and prioritise floodplain and estuarine areas (eg intertidal flats) for inclusion in conservation reserves or to be managed for conservation on private land, with particular attention to habitats for migratory and resident waders	This action extends the assessment of conservation value to conservation management options. The Clarence estuary provides habitat for multiple species of waders and other threatened species. Long term protection of habitats for these species requires statutory or contractual conservation measures.	High value habitat areas for threatened species are identified and sustainable management measures for specific localities recommended. Negotiations about management of these areas in progress. Some conservation measures can be expected to be incorporated into floodplain Partnership Agreements.	Associated with E1, E3 (management of Crown Lands), E5 (regulatory regime for vegetation management in new development applications), E22 (threatened species recovery plans), and E2/E4 which relate to conservation management on private lands.	NPWS	NSW Fisheries, local conservation groups, Wader Study Group, local Councils, landholders, DLWC, waterway users	Capital costs – for assessment process, minimal. Potentially land acquisition costs for areas to be managed as conservation reserves. Maintenance costs for assessment and negotiation process – moderate to high. Also ongoing maintenance costs for management of conservation areas, both on public reserves and on private land (eg using a VCA)	NPWS, DLWC budgets, land holder contributions (eg VCA lands), Commonwealth funds?

Table 7.3 - Threats to Ecological Values - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability	Related actions	Who is responsible	Other stakeholders	Estimated costs	Funding sources
E25 (new)	Initiate a program to identify and evaluate interactions between estuary users and threatened and/or migratory and resident waterbirds with a view to developing management actions that provide sustainable access to the estuary for both groups.	The Clarence estuary presents an important recreational resource, but recreational activities may have an impact on waterbirds through disturbance at critical times. A study that focused on identifying interactions and devising appropriate management actions would be invaluable in protecting waterbirds and their habitat.	Clear understanding of the critical habitat requirements of migratory and resident waterbirds in the Clarence estuary and coastal floodplain. Decision making guidance to local Councils and boating organisations	E1, E24, E3 and E5 all relate to aspects of habitat protection and management in the estuary	NPWS, Regional Vegetation Management Committee	Local councils, DLWC, NSW Waterways, marina operators and waterway users, local bird watching and conservation interest groups	Capital cost minimal, maintenance cost for studies and preparation of guidelines, medium	NPWS
E3 (new)	Prepare detailed Crown Lands Plans of Management, focusing on those parcels of Crown Land that can contribute to restoration of ecological values eg as riparian corridors or by improving connectivity. Priority reaches or subcatchments are Lake Wooloweyah, The Broadwater, Main channel near Ashby, Shark Creek, Roberts Creek, Palmers Channel	Linear parcels of Crown Land in the lower estuary have significant potential to contribute to the restoration of riparian vegetation. Management of some parcels will require negotiation with private landholders, but much of the Crown Land is available as publicly owned corridors in sensitive locations, and is currently unused and unmanaged.	Plans of management in place for three high priority locations in the first instance, to demonstrate the issues that need to be addressed. Implementation of these plans will mostly occur outside the first two years of the plan	E2 and E4 relate to reinstatement of native vegetation on private lands. The Floodplain Partnership Agreement (noted in this section as E15) is also an important tool for habitat restoration, as are actions to change the drainage management on private grazing lands.	DLWC	UNCCMB, Regional Vegetation Committee	Capital cost for preparation of Plans – minimal, but capital costs will be associated with implementation (eg fencing, replanting etc) Maintenance cost – medium to high (plan preparation).	DLWC budget
E5 (new) (see also S16, U19)	Develop a consistent vegetation regulatory regime across all LGAs to protect rare coastal floodplain habitat types (modelled on Maclean LEP Special Emphasis Areas). The regulatory regime will be consistent with the aims and objectives of the Clarence Regional Vegetation management Plan, covering terrestrial, aquatic and riparian vegetation communities.	Loss of floodplain, riparian and aquatic habitats is a significant issue for the Clarence estuary. TSCA protects particular rare or threatened species, but does not necessarily protect other communities/habitats. Consistent LEP requirements can be used to ensure that habitat restoration is given equal planning and assessment importance across the whole estuary and floodplain	Councils work together to remove inconsistent requirements and to provide a systemic scale approach to habitat conservation. PlanFIRST Regional strategy will assist this process.	Maclean Council prepared a biodiversity strategy in 2001, and Grafton Council has resolved to prepare an environmental protection strategy (which will address riparian vegetation) in 2003. See also other actions relating to consistent LEP requirements for sensitive areas (eg sustainability assessments)	All local Councils	PlanningNSW, Regional Vegetation Committee, landholders, NPWS	Capital cost minimal Maintenance costs low to medium (higher if included in the larger PlanFIRST review of the regional Plan)	Council budgets (likely to be unfunded in the first instance)

Table 7.3 - Threats to Ecological Values - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability	Related actions	Who is responsible	Other stakeholders	Estimated costs	Funding sources
E9 (new)	Confirm commercial trawl impacts on seagrass in Lake Wooloweyah, and implement management strategies as necessary to reduce detrimental impacts	Lake Wooloweyah is identified as a coastal lake in the 'significant protection' orientation by HRC. The lake is also a significant fishery area. This action is designed to clarify the interaction between the fishery and the ecological/sedimentary processes in the lake, so that the significance of impacts is recognised and managed.	Clear information about responses of seagrass and benthic macrofauna to trawling activity	See other actions to provide "significant protection" for Lake Wooloweyah, and other actions re Fishery Management Strategies (W9, W16, W10, W11, E3, E10)	NSW Fisheries	Clarence River Fishermans co-operative, recreational fishers	Capital cost minimal, Maintenance costs low to medium (research, discussion and reporting)	NSW fisheries Budget, in association with commercial fishers
E14 (new)	Continue to implement the Clarence Floodplain Project, particularly in relation to partnership development and adding habitat management to water quality considerations.	The Clarence Floodplain Project has demonstrated a range of strategies to achieve integrated management of floodplain and estuaries including identification of priority structures, models for partnerships, etc, and is achieving on the ground works.	Demonstrated changes in landholder willingness and capability to change land and water management practices on the floodplain, co-ordination between landholders on a subcatchment basis, subcatchments for projects selected on systemic indicators	See other actions relating to management of ASS, floodplain and riparian vegetation, directly linked to the Floodplain Partnership Agreement	CRCC	NSW Fisheries, NSW Agriculture, DLWC, NPWS, Clarence Fishermans Co-operative, landholders, cane growers, local Councils, environmental organisations (eg Wetland Care Australia)	Capital cost – high (medium for individual components). Maintenance costs – moderate to high – communication, incentives etc	CRCC, CASSP, NHT, ASSPRO, industry associations, agency investment (eg Environmental Services)
E15 (new) (See also S8)	Expedite the development of regionally applicable Partnership Agreements for floodplain management	See S8. This action is required by the State Government Statement of Intent, following the HRC recommendations. It is also a positive step towards creating a framework where landholders can commit to action on the ground. The Floodplain Partnership Agreement is the principal implementation strategy for the Estuary Management Plan.	Consensus on which management/ implementation issue will be addressed by the Floodplain Partnership Agreement. Partnership agreement signed by key stakeholders is first milestone. Subsequently evidence of enhanced funding success (new funding initiatives) and actual on the ground implementation of new management strategies	This action is required by the State Government Statement of Intent. See also UNCCMB actions, and timeframe for producing a regionally relevant partnership (less than 12 months)	DLWC (UNCCMB)	CRCC, landholders, other state agencies, local Councils	Capital – minimal for the agreement itself, but the agreement will support other capital investment. Maintenance-medium (agency and community time)	DLWC (UNCCMB) in first instance

Table 7.3 - Threats to Ecological Values - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability	Related actions	Who is responsible	Other stakeholders	Estimated costs	Funding sources
E22 (new)	Prepare species recovery plans for relevant estuarine and terrestrial species listed under TSCA and FMA (eg Freshwater cod)	Large numbers of threatened species (particularly migratory waders) are known to use the Clarence estuary and Australia has responsibilities under international conservation agreements. These plans will define management requirements for threatened species, and other actions carry those requirements through (planning and restoration)	Plans prepared for each relevant threatened species, and implementation strategy identified/ negotiated	NPWS has plans in preparation for numerous species (see NPWS web site). However, currently only migratory waders such as the Little Tern would be relevant to the Clarence.	NPWS, NSW Fisheries	Local Councils, waterway users (fishers in particular), DLWC (management of Crown lands and waterways), local environmental interests (eg bird groups)	Capital cost – minimal, Maintenance cost – medium (staff resources for plan preparation). Other costs for habitat restoration are included with specific actions.	Within NPWS and NSW Fisheries budgets
E10 (ongoing)	Implement the Estuary General and Estuary Prawn Trawl Fishery Management Strategies as finalised in consultation with local fishers on the EIS.	These strategies and assessments have been developed in consultation with regional stakeholders and provide a framework for sustainable operation of specific commercial fisheries.	Each Fishery Strategy incorporates monitoring and reporting mechanisms	See also completion of Indigenous Fishery strategy, recreational fishery strategy, management of recreational fishing “havens”, evaluation of trawling impacts in Lake Wooloweyah.	NSW Fisheries, commercial fishers and Clarence River Fishermans Co-operative	Recreational fishers, environment groups, Fisheries consultative groups	Capital cost – minimal. Maintenance cost – medium (staff resources)	Within NSW Fisheries budget
E12 (ongoing)	Finalise National Recreational Fishing Survey and make regional data available to assist in assessing the impacts of recreational fishing on fish stocks, and value of recreational fishing to the local community	Important baseline information for management decisions about commercial and recreational fishing interactions.	Reliable statistics available about recreational fishing effort and catches	Supports the Recreational Fishing Strategy, and any future reviews of Commercial fishery closures for recreational fishing areas	NSW Fisheries	Commercial fishers, recreational fishers, environment groups	Capital cost – minimal. Maintenance cost – medium (Fisheries staff resources for analysis, documentation and reporting of information)	Within NSW Fisheries budget
E13 (ongoing)	Expedite the implementation of the State Indigenous Fisheries Strategy, particularly as it affects Indigenous fishers in the Clarence	This strategy will respond to and formalise rights for indigenous fishers in NSW, beyond recreational access	Consultation process with indigenous communities, and agreement on acceptable fishery access and management	See other fishery strategies, each of which is supported by an EIS	NSW Fisheries	NSW State Land Council, individual Land Councils and elders groups	Capital cost – minimal Maintenance cost – high – consultation, document production and implementation advice.	Within NSW Fisheries budget

Table 7.3 - Threats to Ecological Values - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability	Related actions	Who is responsible	Other stakeholders	Estimated costs	Funding sources
E23 (ongoing)	Expedite the completion of the NSW Recreational Fishery Strategy and EIS	Together with the strategies for various commercial sectors, this strategy will presents a means to achieving sustainable fishery resources in NSW. Four recreational fishing 'havens' have recently been created in the Clarence estuary, after extensive consultation	Strategy and EIS prepared, consultation with fishery sectors and community	See other fishery strategies and EIS	NSW Fisheries	Recreational and commercial fishers, environment groups, local businesses dependent on recreational fishing expenditure	Capital cost – minimal. Maintenance cost – high – research, consultation, document production, exhibition, implementation advice	Within NSW Fisheries budget
E16 (ongoing)	Enforce boat speed and no wash regulations for narrow channels (such as Palmers Channel) where boat wakes contribute significantly to bank erosion and restrict recovery of riparian vegetation	In the open estuary wind waves and currents dominate bank erosion processes. However, in narrow channels, boat wash can significantly increase the wave power impacting on banks of unconsolidated sediment	Stability of the banks in critical areas where erosion can be attributed (at least in part) to boat wash impacts	Other actions to protect and restore Palmers channel area.	NSW Waterways	Recreational and commercial waterway users, DLWC and private landowners.	Capital cost – minimal; Maintenance costs medium (staff time for education and enforcement activity)	Within NSW Waterways budget
E20 (ongoing)	Maintain strict quarantine controls on vessels entering the estuary and on oyster transfers from other estuaries	The Clarence is currently free from a number of aquatic plant and animal pests which would threaten ecological health and productivity.	Clarence estuary remains free of introduced pests and diseases	Indirectly related to actions promoting Port maintenance and attracting new marine based industries, including aquaculture.	AQIS	Shipping contractors, NPWS, NSW fisheries, Clarence River Fishermans Co-operative, recreational cruising yacht sailors	Capital costs – minimal; Maintenance cost – medium (staff time)	Within AQIS budget.
E21 (ongoing)	Further develop and implement the Clarence Aquaculture Development Plan	Aquaculture is a valuable strategy for meeting community demand for seafoods and other marine resources, without depleting natural fish, crustacea and shellfish stocks. The strategy is designed to plan how productive fish and prawn farms can be operated, with minimal impacts on natural values such as estuary water quality and ecology, and with regard to floodplain constraints such as ASS.	Fish and prawn farms are properly sited, and operated in a sustainable manner that complies with all relevant legislation	See other fishery management strategies (E10, E12, E13, E23)	NSW Fisheries	Commercial Fishers, EPA, local government, PlanningNSW, environment interests.	Capital costs – minimal Maintenance costs – high for education and training, best practice guidelines etc	Within NSW Fisheries budget

Table 7.4 - Managing User Interactions - New actions for initiation in the first two years and continuing actions to support sustainable management

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated costs	Sources of funds
U3 (new)	Prepare Aboriginal cultural heritage study and plan for NPWS holdings	Much of the physical evidence of past Aboriginal occupation has been damaged or destroyed by various land uses. This action is designed to provide clear information about the extent to which NPWS holdings conserve a representative sample of regional cultural heritage sites and that they are managed in a sustainable manner.	Local Aboriginal community participates directly in studies and development of management strategies. At-risk sites identified and protection measures implemented.	Aboriginal heritage study and strategic plan for the whole lower Clarence floodplain (U4) (part of Crown Lands Assessment first and then private lands as possible). See Catchment Blueprint.	NPWS	Local Aboriginal community	Capital - minimal, but this study may lead to a need to install protective structures at some locations. Maintenance costs - medium for strategy preparation, medium for ongoing consultation and management.	NPWS budget
U5 (new)	If economically justified and in consultation with representatives of the local Aboriginal community update the Part 5 assessment and development approval and obtain the necessary licences and permits for capital dredging of the main shipping channel, including both sand dredging upstream of the rock bar to Folbigg Point, and enhancing the channel through the entrance rockreef. Continue to consult with representatives of the local Aboriginal community about the management of the Aboriginal heritage values of the rock reef. Note that there is little if any benefit to commercial shipping in dredging the sand unless the rock reef is also dredged and it is most unlikely that one would be undertaken without the other. Note that maintenance dredging would be carried out under SEPP 34.	The Clarence is the only commercial port on the north coast. A safe navigation channel will minimise risks to vessels and also to help to safeguard the ecological health of river (eg due to shipping incidents). However, dredging should only proceed if economically justified, and after cultural heritage issues associated with the rock reef are resolved.	Sound scientific and economic evidence to justify maintenance dredging in the main shipping channels. Should include protocols for frequency of maintenance (and triggers), sediment budget impacts.	U1, W21 (sedimentary processes and sand and gravel management strategy), U6, U24, U25	NSW Waterways Authority	Shipping contractors, DLWC, Maclean Council, Aboriginal community	Capital costs - minimal. Maintenance costs - medium for staff resources to finalise and assess the document.	NSW Waterways Authority
U6 (new)	Consider options for funding dredging of the shipping channel and other boating channels when necessary for navigation safety. All dredging must be consistent with a sand and gravel management strategy based on a sound understanding of the sedimentary process drivers and sediment budget of the estuary. Funding options may include the sale of dredged sand for land fill purposes. Any such filling would be subject to a separate development assessment and licensing process, based on sustainability principles.	Dredging to deepen and/or stabilise the shipping channel involves high capital costs, which need to be justified in terms of shipping activity. Sand availability for land fill is also an important issue. The two issues are quite separate, although there may be opportunities for co-operation subsequent to both activities being demonstrated to be environmentally and socially justified/feasible.	If dredging proceeds, it is conducted in an economically sustainable manner.	Sources of funds for approved dredging are available and do not assume demand/agreements from other activities which are subject to separate development assessment processes.	NSW Waterways Authority	Shipping contractors, DLWC, dredging contractors, local Councils, Aboriginal community.	Capital cost low, maintenance costs medium.	NSW Waterways, DLWC, contributions from Port users or land developers.

Table 7.4 - Managing User Interactions - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated costs	Sources of funds
U24	Dredge the shipping channel between the entrance bar and Folbigg Point in accordance with the approved and licensed strategy, provided there is a clear economic justification for the works. Dredge the entrance across the rock reef in accordance with the approved and licensed strategy, subject to consultation with the local Aboriginal community and relevant state agencies about cultural heritage values.	This action will provide for safe commercial shipping and may encourage further shipping trade through the port. Economic justification is essential.	Use of the port by current vessels is not compromised by excessive sedimentation in the main shipping channels. Impacts occur as predicted.	See EIS requirements, also sand and gravel resources strategy, based on sedimentary processes study for the whole estuary.	NSW Waterways Authority	Shipping contractors, DLWC, dredging contractors, local Councils, Aboriginal community.	Capital cost - very high. Maintenance costs - ongoing. Monitoring and maintenance activities high.	NSW Waterways, DLWC, contributions from Port users or land developers.
U25	Prepare an REF and obtain a standing approval for reshaping of sand bars outside the port entrance and east of the rock reef, with such an approval to be activated only in carefully defined circumstances where navigation is restricted.	From time to time, sand accumulates as a bar outside the entrance to the port and may cause a navigation hazard.	Sand management is consistent with river mouth sediment budget and occurs only within clearly defined parameters.	U5, U6, U24, W21	NSW Waterways Authority	DLWC, Shipping contractors, Maclean Council	Capital cost for REF low, maintenance costs - medium to high. Capital costs for sand management high.	NSW Waterways, DLWC, port users?
U10 (new)	Prepare detailed Crown Lands assessments for all parcels of Crown Land on the estuary bank/shoreline	A network of roads (often held as enclosure permits by adjacent landholders) in the riparian zone presents potential for management as vegetated buffers. Some shoreline lands also have high habitat value (eg for waders) or strong recreational use potential. Studies/assessments for these parcels of Crown Land would underpin strategic management decisions.	Sufficient detail on waterfront Crown Lands for sound management decisions. Highest conservation value lands identified and Plan of Management prepared to provide environment protection.	Yamba plan has been prepared - providing a reserve system to meet strong recreational demand. See also U11 (waterway user strategy) and E? (high priority Plans of Management for areas which have major habitat restoration values)	DLWC/Trusts	Local government, landholders, conservation interests (community) NPWS, recreation interests.	Capital costs - low. Maintenance costs - preparation of assessments and Plans of Management, negotiation with landholders - high.	DLWC, local government (not currently budgeted)
U18 (new)	Throughout the Clarence valley, new land zonings towards more intensive use should only occur after a sustainability assessment has been prepared and evaluated (in consultation with PlanningNSW if required under new SEPP and PlanFIRST implementation)	Recommended by HRC for all coastal lakes but for other locations ties zoning and development assessment directly to local implementation of sustainability principles.	Completion and evaluation of sustainability assessments - do they produce a different and cost effective land use result for the Clarence floodplain.	Initial implementation at Lake Wooloweyah. See also actions re habitat assessment and protection, consistent planning approaches and water cycle management.	Local Councils	PlanningNSW HRC, DLWC, NPWS, local community groups.	Capital costs - minimal. Maintenance costs - staff time for planning, training and advice, medium to high.	Local government, proponents of new development

Table 7.4 - Managing User Interactions - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated costs	Sources of funds
U19 (new) (see S16)	Develop a consistent zoning strategy for all local Councils in the Clarence valley (see PlanFIRST)	Much of the statutory power necessary for implementation of Estuary Management Plan actions will be provided through the Local Environment Plans of local Councils. Consistency between Councils in relation to major, systemic issues will provide more ecologically sustainable outcomes, and provide greater certainty for land users/developers.	LEPs provide clear whole of system performance criteria for natural resource values.	See Action U18 re sustainability assessments, U9 re stormwater management, and E5 re consistent regulatory/planning approaches to vegetation management. The new North Coast Regional Strategy by PlanningNSW will also be relevant.	Each local Council	PlanningNSW	Capital - minimal Maintenance - medium	Council budgets, PlanningNSW budgets
U20 (new)	Prepare operational and environmental plans for Yamba and Iluka boat harbours	Major marine operators are licensed under POEO. This action provides guidelines and protocols for sound environmental management of boat harbours with multiple users, both in sensitive locations.	Plans prepared, evidence of implementation. Maintenance of agreed water quality in boat harbours. Minimal environmental incidents.	Actions re Crown Lands Plan of Management, measure to protect water quality.	For formulation: DLWC, commercial fishers, marina Managers, Local Council	For implementation :Local Councils, marine operators, fishing industry, recreational boat owners (local and cruising). EPA will also have an interest in environmental performance	Capital cost - for plan minimal, for implementation potentially moderate. Maintenance costs - plan preparation - medium, with some ongoing management and reporting costs.	DLWC, local Councils
U15 (ongoing)	Maintain the Pro-Am forum between commercial and recreational fishers.	This forum provides opportunities for ongoing discussion of interactions between local commercial and recreational fishing sectors. Past successes in developing solutions to conflicts and whole of fishery response to NSW Fisheries.	Group meets on a regular basis and continues to address fishery management interactions constructively.	See E9, E10, E12, E13, E23, all relating to management of fishery sectors.	Clarence Fishermans Co-op and recreational fishing groups	NSW Fisheries	Capital and maintenance costs very low	Industry and community representative time
U16 and U17 (see E9, E10, E12, E13 and E23)	See discussion of fishery management strategies in relation to ecological values. Implementation of these strategies will also address interactions between different fishery sectors.			See E9, E10, E12, E13 and E23				

Table 7.4 - Managing User Interactions - New actions for initiation in the first two years and continuing actions to support sustainable management (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Estimated costs	Sources of funds
U21 (ongoing)	Implement river bank management plans for villages and reaches affected by bank erosion (eg Ulmarra and Palmers Island)	Protect property and infrastructure, as well as high conservation value habitats which are affected by severe erosion.	Agreed bank protection and property management measures to manage risks are in place.	See sedimentary processes study and actions for restoration of riparian vegetation.	DLWC	Local Councils, North Coast Water, land owners, CRCC	Capital costs - medium to high and potentially requiring ongoing maintenance. Maintenance (landholder awareness and education, planning measures, etc) - medium.	DLWC, CRCC and Council budgets plus grants, North Coast Water.
U22 (ongoing)	Apply and monitor the success of Clause 39 of the Maclean LEP re the Wooloweyah Special Emphasis Area – sustainability assessments for any intensification of land use	This action is intended to ensure that changes to land use in sensitive areas are justified in sustainability terms. (see HRC 2002)	Measures of natural values maintained and enhanced, further catchment disturbance minimised	See also actions re management of agricultural lands to the south of Lake Wooloweyah, and sustainability assessments, plus measures for sustainable fishery management. Ensure that Yamba STP discharges do not impact on Lake Wooloweyah or its catchment.	Maclean Council	HRC, UNCCMB, local residents	Capital – minimal Maintenance – medium (staff time and extension information)	Council budget
U23	Continue maintenance of flood protection structures by CRCC. This should be done in the context of a review of the Floodplain Risk Management Plan in the light of the Floodplain Partnership Agreement.		Appropriate controls of flood risks maintained. Structural works addressed in Floodplain Partnership Agreement.	Floodplain Partnership Agreement and actions relating to modifications to floodgates to enhance habitat values and reduce water quality risks.	CRCC	Landholders, DLWC, NSW Fisheries, NPWS	Capital - high. Maintenance - medium high (estimated CRCC currently spends $360,000 annually on maintenance of flood structures, and more after major floods)	CRCC, DLWC (flood program)

7.2 ONGOING MANAGEMENT FOR A HEALTHY ESTUARY

This section outlines actions that will be initiated in the medium to longer term, consolidating and carrying forward the sustainability achievements of the first eighteen months of implementation of the Estuary Management Plan. It is anticipated that over this initial eighteen month period, the relationship between the Estuary Management Plan and several other regional planning and natural resource strategies will be clarified.

It is proposed that the Estuary Management Plan will be reviewed after three years of implementation. The review process will include an assessment of the extent to which high priority actions have been implemented by each responsible organisation, community feedback on achievements and outcomes, as well as new or outstanding issues, community feedback on the continuing relevance and priority of objectives, and a trend based evaluation of improvements in environmental outcomes (such as water quality and habitat value).

Actions that are recommended for the second phase of implementation are noted in **Table 7.5**.

Table 7.5 - Stage 2 Actions - New Actions to be initiated within five years

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Capital and maintenance costs	Funding options
	Managing uncertainty and implementation							
S20	Review progress in implementing the Estuary Management Plan. This review should occur in the first instance after three years.	The Estuary Management Plan is designed to be an adaptive plan for the estuary. Although progress will be monitored annually, this review will allow community feedback on the objectives.	Review process defined. Role of community in review process defined. Review prepared and considered by implementation committee.	Actions re Partnership Agreements, Committee role and membership.	Joint local Councils	DLWC, local community	Capital cost - minimal. Maintenance cost - low to medium for consultation and review process.	Joint local Councils. Include in Floodplain Partnership Agreement.
	Integrated water cycle management							
W4 (new)	Upgrade the Yamba STP	Yamba is a major growth area in the Clarence valley and current effluent management impacts on wetland habitats. Upgrade required both in terms of treatment capacity and effluent management.	Integration of demand management and waste water. Upgrade planning demonstrates sound environmental benefits.	Water demand management, water sensitive design for new development. Integrated water management strategy, actions to provide significant protection for Lake Wooloweyah.	Maclean Council	Other local Councils, DLWC, local community	Capital cost very high. Maintenance cost - high (including Load Based Licence fees)	Council and DLWC funds (Small Towns Sewage Scheme)
W5 (new)	Implement an integrated stormwater and effluent management strategy for Grafton	Stormwater and effluent discharges from Grafton city impact on water quality in the estuary, particularly at low flow. There is good potential to integrate the management of these discharges to reduce impacts on water quality and to enhance the remediation of floodplain habitats.	Compliance with estuary and tributary water quality indicators. Extent of environmental re-use of stormwater and effluent flows.	Water cycle management forum, Floodplain Partnership Agreements, Grafton City Environment Strategy, remediation of Alumy Creek	Grafton City Council	DLWC, EPA, NSW Fisheries, NPWS, local community, other Councils	Capital costs - very high. Maintenance costs - high.	Council funds supplemented by grants (DLWC, EPA) with possible enhancement through Floodplain Partnership Agreement.
W6 (new)	Upgrade the Maclean STP and include services for Ilarwill and Lawrence	Ilarwill and Lawrence are currently serviced by on-site effluent management, with risks to water quality. Capacity and quality of effluent from Maclean STP should be improved, provided investigations demonstrate positive cost/benefit outcomes for the estuarine environment.	Cost/benefits demonstrated re river health. Sustainable local infrastructure provided.	Upgrades of STPs should proceed within framework set by Water Cycle Forum and Floodplain Partnership Agreement		DLWC, EPA, other Councils, NSW Fisheries, NPWS, local community	Capital cost - very high. Maintenance costs (including Load Based Licence fees) - high	Maclean Council, DLWC (Small Towns Sewage Scheme)

Table 7.5 - Stage 2 Actions - New Actions to be initiated within five years (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Capital and maintenance costs	Funding options
W17	Modify the design and management of operation of floodgates at various sites, consistent with NSW Fisheries guidelines and priorities based on system wide ecological assessment. All modifications must be conducted in consultation with local landholders. As more information about farm profitability and the costs of floodgate management becomes available, it may be that changes to land use, as well as land management are the preferred action for some parts of the floodplain	Changes to floodgate design and operational procedures and to drain management procedures will deliver major ecological benefits to the floodplain and estuary.	Evidence of improved fish habitat and fish passage into floodgated tributaries.	Continue implementation of Clarence Floodplain Project (eg see CFP newsletter, June 2002 for current floodgate trial locations), and enhance through Floodplain Partnership Agreement (priorities and funding for catchment based changes).	CRCC	NPWS, NSW Fisheries, landholders, commercial and recreational fishers	Capital costs - very high. Maintenance costs - high.	CRCC and grants (ASSPRO, CASSP, NHT, etc). Other sources through Partnership Agreement.
W22	Extend River Styles Assessment into the estuary, with particular attention to bank stability and potential channel changes	This action is directly related to the clarification of sedimentary processes in the estuary and will provide information to facilitate decisions on management strategies for eroding banks (eg capital works, planning for retreat, etc)	Decision makers have clear understanding of the drivers of bank erosion and shoaling in the estuary, the extent to which processes and impacts can be controlled, and the timeframe over which current trends can be expected to operate.	See High priority actions for sedimentary process studies, and a sand and gravel management strategy for the estuary. Could be done as part of sedimentary process action.	DLWC	Local Councils, CRCC, landholders, Catchment Board	Capital cost - minimal. Maintenance costs - medium to high (less if done as part of W21)	DLWC/NHT (not currently funded)

Table 7.5 - Stage 2 Actions - New Actions to be initiated within five years (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Capital and maintenance costs	Funding options
	Managing threats to ecological values							
E2	In consultation with landholders, enhance riparian vegetation in selected tributaries of the lower estuary. Subcatchments with good connectivity should be a priority, as should selected cane channels. Priority reaches or subcatchments include Coldstream River, Shark Creek, Palmers Channel	Loss of riparian and floodplain habitats is a major constraint to the ecological health of the estuary. This action follows E1, E24, E3 in terms of implementing remediation in key areas.	Extent of riparian habitats and connectivity in selected reaches.	This action is likely to be included in the Floodplain Partnership Agreement. Also linked to Plans of Management for Crown Lands (with respect to habitat continuity).	UNCCMB	CRCC, NPWS, DLWC, landholders	Capital - low. Maintenance - high. (negotiation, planning, etc)	Catchment Board (NHT) through Partnership Agreement, Environmental Service Scheme and Voluntary Conservation Agreements.
E4	Formulate and implement incentive arrangements to encourage landholders to change the management of riparian lands on their properties	As above. This action is the means to achieve changed property management to restore riparian habitats.	Extent of riparian habitats and connectivity in selected reaches.	This action is likely to be included in the Floodplain Partnership Agreement. Also linked to Plans of Management for Crown Lands (with respect to habitat continuity).	UNCCMB	CRCC, NPWS, DLWC, landholders	Capital - low. Maintenance - high. (negotiation, planning, etc)	Catchment Board (NHT) through Partnership Agreement, Environmental Service Scheme and Voluntary Conservation Agreements.
E6	Implement Maclean Council's Biodiversity Strategy, and aspects of Grafton Environmental strategy relating to biodiversity	Some actions from the biodiversity strategy are noted elsewhere as high priority actions. The strategy includes clearing controls, weed management, data management relevant to the estuary, and notes the importance of restoration of riparian zones to the Shire's biodiversity.	See E1, E2, E3, E24	The strategy provides detail for Maclean Council (but does not identify priority rehabilitation areas). See Actions E1, E2, E3, E24.	Maclean Council	Other Councils, CRCC, landholders, NPWS	Capital - minimal. Maintenance - high (further studies, planning controls, etc).	Maclean Council funds

Table 7.5 - Stage 2 Actions - New Actions to be initiated within five years (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Capital and maintenance costs	Funding options
E7	Conduct an audit of environmental and noxious weeds in the estuary and floodplain areas – species, context and function, to determine priority areas for weed control works. The audit should also include weeds (ie unwanted plants) in wader habitat areas.	Essential information for overall improvement of riparian and floodplain habitats.	Priority weeds and locations identified. May include mangroves or wader habitat areas.	Related to Biodiversity Strategy, management of riparian vegetation.	UNCCMB	NPWS, Councils, landholders, wader study group, NSW Agriculture, Clarence Valley Weed Authority.	Capital - minimal. Maintenance - medium to high.	UNCCMB (potentially part of Floodplain Partnership Agreements)
E8	Explore further options for voluntary fishery closures to conserve fish and prawn stocks, including Lake Wooloweyah	This action depends on the results of E9, and the implementation of current recreational fishing havens.	Options identified as necessary. Implementation enhances fish and prawn stocks in protected areas.	Also related to U15, U17, U16, etc, and to the outcomes of detailed sustainability assessment for Lake Wooloweyah. E24 - priorities for conservation management areas also precedes this action.	NSW Fisheries	Commercial and recreational fishers, NPWS, local community.	Capital minimal maintenance costs - depend on potential impacts of further closures on existing operators, assessment of relative costs and benefits.	Within NSW Fisheries budgets for fishery management.
E17 (see W17)	Co-ordinate the management of floodgates and other barriers to fish passage with action plans for ASS hot spots and vegetation management	This action is noted to reinforce the importance of integration of soil, water and vegetation management across the floodplain/ estuary interface.	See W17	This action will be implemented through the Floodplain Partnership Agreement, building on the achievements of the Clarence Floodplain Project.	UNCCMB	CRCC, NSW Agriculture, NSW Fisheries, DLWC, landholders, local Councils	Costs covered in W17 and Floodplain Partnership Agreement	UNCCMB (potentially through Floodplain Partnership Agreement
E18	Provide opportunities for local community groups to contribute to co-ordinated ecological monitoring program for the estuary and coastal floodplain	This action provides for direct community contributions to data gathering and management in relation to estuary health.	Community satisfaction with information types and access, plus effort required. Community participation provides useful sustainability information to enhance management.	See S11, S12, W23, W24	UNCCMB	CRCC, DLWC, NSW Fisheries, local environment groups	Capital - minimal. Maintenance - medium in terms of in kind community contributions	UNCCMB

Table 7.5 - Stage 2 Actions - New Actions to be initiated within five years (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Capital and maintenance costs	Funding options
	Managing User Interactions							
U1 (new)	Prepare a sand and gravel resources management strategy for the whole estuary	Estuary sedimentary processes, affecting bank erosion, bed shoaling and scouring are very dynamic. The estuary is a significant potential source of sand and gravel for the construction industry, and shoaling also affects navigation. Poor management decisions can have major detrimental impacts. The objective of this action is to ensure that if sand and gravel resources are obtained from the estuary, extraction accords with a plan that identifies those locations in the estuary where selective dredging would be beneficial for environmental reasons. The strategy would reduce ad hoc applications for dredging in unsuitable areas.	All maintenance and resource based dredging is conducted within a consistent framework (locations, volumes, triggers, water quality and ecological risks) that recognises sediment dynamics in the estuary and potential channel stability and ecological impacts of sediment extraction.	W13 (dredging of Micalo and Shallow Channels), W21 (sedimentary process drivers study), U5 and U6 (dredging the main shipping channel)	DLWC	Local Councils, construction industry / sand and gravel suppliers, NSW Fisheries, conservation and community interests.	Capital costs (for strategy) - minimal. Maintenance costs for preparation of strategy medium. Capital costs for implementation in terms of targeted dredging are likely to be high, but disbursed over a long period.	DLWC, potentially with contributions from other stakeholders.
U7	Implement the Grafton and Maclean Stormwater Management Plans in relation to actions that support clear benefits in estuary health	Not all potential stormwater management actions in these plans are cost effective in terms of estuary health. Actions implemented will be those that support other initiatives.	Integration of selected stormwater management actions to create floodplain rehabilitation strategies, or to maximise control of high risk locations.	See U8, W1, U9, W5	Grafton Council, Maclean Council	UNCCMB, EPA, DLWC	Capital costs - high, but can be reduced by focus on cost benefits. Maintenance costs - high.	Grafton and Maclean Councils, with possible support through Floodplain Partnership Agreement
U8	Implement the Alumy Creek Management Plan	The Alumy Creek plan identifies measures to improve flushing, remove weeds, reduce stormwater impacts, enhance wetland and riparian habitats and improve fish passage. Alumy Creek is a high risk ASS area.	Water quality in Alumy Creek meets objective of protection of aquatic ecosystems.	This plan should be implemented in association with U7 (stormwater), effluent management for Grafton, W1 (water cycle forum recommendations) and S10 (partnership agreements)	CRCC/Grafton Council	UNCCMB, DLWC, NSW Agriculture, NSW Fisheries, landholders	Capital costs - high. Maintenance costs - high (see Alumy Creek plan for details)	Funds not currently available. To be addressed through the Floodplain Partnership Agreement.

Table 7.5 - Stage 2 Actions - New Actions to be initiated within five years (cont)

Action ID	Action	Why this action is important	Accountability measures	Related actions	Responsible organisation	Other stakeholders	Capital and maintenance costs	Funding options
U9	Prepare a DCP for best stormwater practice (water sensitive urban design) for new development in Grafton City and Maclean Shire. This action is a lower priority for other LGAs	This action is likely to be part of amendments to local Plans as PlanFIRST is implemented. Grafton and Maclean Shires have most existing development and growth pressure, so water sensitive urban design is most important for those areas in the first instance.	New development implements National standards for water sensitive urban design	See W1, U7, W5	Grafton Council, Maclean Council	Other local Councils, PlanningNSW, urban development institute	Capital - minimal. Maintenance - medium.	Local Councils
U11	Prepare a waterway user strategy, focusing on public recreational user access to the foreshore and waterway. This strategy would include identification of potential conflicts between natural values and user aspirations and mechanisms to resolve those conflicts.	Although waterway user conflicts are not a major issue at the moment, growth in residential and tourist populations will increase pressure on popular sections of the waterway, and increase potential for interaction between different user groups.	Emerging conflicts identified and monitored. Waterway users involved in the planning process. Likely outcome of this process is further zoning of the waterway to manage incompatible activities, also possibly voluntary agreements.	Foreshore facilities for public access to be addressed in Plans of Management for Crown Lands (eg Yamba Bay already prepared)	NSW Waterways Authority	DLWC, local Councils, waterway users, marina operators, Chamber of Commerce, fishing industry	Capital - minimal. Maintenance - medium (plan preparation)	NSW Waterways budget (not currently funded)
U14	Monitor the use of personal water craft on the estuary. Use community education to encourage use only in open sections of the estuary (away from sensitive habitats) and also to reduce potential conflicts with fishing vessels.	This action is a detail of U11, addressing a particular concern amongst some members of the local community	See U11	See U11	See U11	See U11	See U11	See U11
U24	Maintain a watching brief on studies and statutory management of 2-stroke boat fuels.	Internationally, there are regulations in place re the use of 2-stroke fuels on sensitive waterways. Any actions for the Clarence estuary in this regard will depend on State and National policy initiatives.	Local decision makers aware of risks, current policy and potential management options.	Related in the longer term to actions to protect sensitive waters such as Lake Wooloweyah. Other actions will provide positive outcomes before addressing this issue.	NSW Waterways, EPA	Local boating community	Capital - low. Maintenance - low.	Within agency budgets (core business).

7.3 ACTIONS FOR STAGE 3 – MORE THAN 5 YEARS

At this stage, only a small number of actions are recommended for initiation more than five years after the commencement of the Estuary Management Plan. However, as noted in relation to high priority actions, it is anticipated that many of the earlier actions will continue to require management attention throughout this period. In addition, a range of monitoring, reporting, community feedback and reporting actions, and program review actions will continue over the life of the Plan.

New actions to be initiated in Stage 3 of the Plan are noted below.

- Implement waterway user strategy (boating facilities)
- Implement water way user strategy (shore based passive recreation)
- Water management plans for other specific areas/issues, to be determined as the details and achievements of the Floodplain Partnership Agreement gain momentum.

Actions that are likely to roll over into the 5 to 10 year timeframe include changes to floodplain land management, through detailed property plans and catchment based management plans (sponsored/brokered through the Floodplain Partnership Agreement). These will continue to be developed and implemented over 5 to 10 years.

Similarly, measures to protect wader habitat, by zoning, acquisition or voluntary conservation agreements and plans of management (public lands) are likely to continue to be established over more than five years. Restoration and maintenance of riparian habitats will require ongoing attention over this time period.

Maintenance of fundamental flood protection and entrance training structures will continue to be required throughout the life of the plan and is a high 'fixed' cost for the community.

Further maintenance dredging of the main shipping channel may also be required intermittently in the future, and should be carried out as necessary, provided the dredging is consistent with the sand and gravel management strategy for the estuary.

Further detail on the specifics of these actions, for this timeframe, should be developed when the Estuary Management Plan is reviewed after three years.

APPENDIX 1

Council Correspondence

maclean
h i r e

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50 River Street

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NSW 2463

communications to:

The General Manager

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NSW 2463

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ax 02 6645 3552

email

lean@msc.nsw.gov.au

Reference: 01378
Contact: D.Morrison

12 December 2002

The General Manager
Clarence River County Council
PO Box 436

COPY

Dear Ian

Clarence Estuary Management Plan

I wish to advise that Council, at its Meeting held on 11 December, 2002, resolved to advise you, as project manager, that it endorses the Clarence Estuary Management Plan, however with an amendment that clarifies the process used to develop the Plan and giving relevant status to the preceding Estuary Management Study and Processes Study.

I have discussed this proposed amendment with Pam Dean Jones of Umwelt, who has indicated that such an amendment would be acceptable.

I have attached copies of correspondence from both Grafton City and Pristine Waters Councils which were received during the exhibition period. Both those letters indicate endorsement of the Plan. To date, no advice has been received from Copmanhurst Shire Council.

I assume that the way forward now is for the CRCC, as project manager, to request Umwelt to finalise the plan with the amendments requested by this Council and Grafton City Council, and then to seek the formal endorsement of the Dept. Land and Water Conservation.

On behalf of Council, I wish to convey appreciation for your initiative to have this very valuable Plan developed. It will provide a positive supplement to other natural resource based plans and assist in the coordinated environmental management of the Clarence Estuary.

Yours faithfully

David Morrison
MANAGER STRATEGIC PLANNING

Copy to :
Richard Hagley, Dept. Land & Water Conservation, PO Box 664, Alstonville NSW 2477
Pam Dean Jones, Umwelt Australia, PO Box 838, Toronto NSW 2283

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The Council of the City of Grafton

City Living - Country Sty

The General Manager
Maclean Shire Council
PO Box 171
MACLEAN NSW 2463

Dear Mr Bryant

CLARENCE ESTUARY MANAGEMENT PLAN
CONSIDERATION OF PLAN BY GRAFTON CITY COUNCIL

Council at its Ordinary meeting held on Monday 9 December 2002, resolved to advise your Council that Grafton City Council endorses the Clarence Estuary Management Plan, as publicly exhibited, for adoption. Further, Council has requested your Council and the Clarence Estuary Management Committee to consider the issues previously stated in submissions by Grafton City Council, when the Plan is implemented and reviewed.

In summary, these issues relate to the model adopted for institutional arrangements to implement the Plan, additional on ground works and greater certainty of costs for Council and arrangements for the sharing of costs with other stakeholders.

Please feel free to contact Council's Planning Services Manager, Mr Scott Lenton, of Council's Planning and Environmental Services Department, on (02) 6643 0234, if you have any further enquiries. Should you require to meet with Scott at Council, you are advised to pre-arrange an appointment to ensure he will be available.

Yours faithfully

RAY SMITH
GENERAL MANAGER

10 December 2002

In Reply Please Quote:
700 SDL:TT

FILE No. 013 T8
DOCUMENT No.
M&C 12 DEC 2002
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OFFICER CODE TSE

cc: The Chairperson, Clarence Estuary Management Committee, c/- Maclean Shire Council

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IN RESPONSE PLEASE QUOTE
MB
00421

FURTHER INQUIRIES CONTACT
Marcy Burns

17th October, 2002

Clarence Estuary Management Committee
Maclean Shire Council
PO Box 171
MACLEAN NSW 2460

Attention: Mr. David Morrison

Dear Sir,

Draft Estuary Management Plan

Thank you for the opportunity to comment on the Draft Clarence Estuary Management Plan.

Pristine Waters Council has reviewed the Draft Plan and feels that the objectives and outcomes suggested in the Plan adequately portray the view held by Council in regards to the priority of actions that are required to protect and enhance the Clarence estuary and associated floodplains.

Council agrees that a major objective of the Plan should be to facilitate an integrated management approach across all of the Local Government areas within the lower Clarence Valley, and supports the action to develop a formal agreement between all major regional groups.

Council is also supportive of the suggestion to develop a consistent zoning strategy across the Clarence Valley Councils using the implementation of PlanFirst. Council realises that this would be a major step towards effective protection of the estuary system by overcoming the problems associated with overlapping boundaries and inconsistent management regimes.

Council welcomes the initiative to prepare an annual report on actions and progress in relation to sustainable management of the estuary as this would be highly useful for State of the Environment Reporting.

It would be of great benefit to Council to receive an annual report which provides a "*snap shot*" of the progress up to date and any approaching tasks. This would enable Council to participate in extra projects when funding allows for it.

Council facilitates various community environmental enhancement projects including; "National Tree Day", "National Water Week", "World Environment Day" and "Clean up Australia Day". These projects could be channelled into suitable areas or projects within the Clarence Estuary and associated Floodplains, thereby helping to achieve the milestones within the Plan.

A Floodplain Partnership Agreement, Water Cycle Management Forum, and a Comprehensive Assessment of Estuarine and Floodplain Vegetation would all be a valuable asset to the future management of the estuary.

Pristine Waters Council would like to thank you for the opportunity to provide comments on the Plan and hopes that they have been of some use.

Pristine Waters Council currently has one position on the Clarence Estuary Management Committee, which has been ardently taken up by Councillor Cathy Peck. It would, however, be of grate benefit to Council if a position was also made available for Council's Environmental Planning Officer, enabling effective communication between Council staff members.

Pristine Waters Council would therefore like to make a recommendation that a position is created for a Staff member from Pristine Waters Council Environmental Services Division to sit on the Clarence Estuary Management Committee.

Yours faithfully,

Ken Exley
Divisional Manager Environmental Services