APPENDIX A –

Manning Estuary Coastline and Catchment Advisory Committee (MECCAC)

Update of Table 3: Manning River Estuary Management Plan – Implementation Schedule (Subject to Funding)

May 2014

This table was revised by the MECCAC Estuary Management Plan Sub-Committee and endorsed to be reported to Council for public exhibition at the MECCAC meeting on Thursday 13 February 2014.

At its Ordinary Meeting on Wednesday 19 March 2014 Council resolved that:

C3 - MANNING RIVER ESTUARY MANAGEMENT PLAN 2009 (S345)

MOVED Cr Keegan/West

(i) That the attached revised Table 3 – Implementation Schedule of the *Manning River Estuary Management Plan 2009*, be placed on public exhibition for a period of 28 days, together with the attached Implementation Prioritisation spreadsheet

(ii) That any exhibition submissions be referred to the Manning Estuary Coastline Catchment Advisory Committee for consideration.

(iii) That progress against the Manning River Estuary Management Plan 2009, be updated annually by way of addendum agreed by the Manning Estuary Coastline Catchment Advisory Committee.

The **MOTION** was **CARRIED**.

For: Bell, Christensen, Jenkins, West, Tickle, Epov, Keegan, Jennison & Hogan.

The updated Table 3 and Implementation Prioritisation spreadsheet was placed on exhibition for a period of 28 days from Thursday 20 March until Wednesday 16 April 2014. One submission from the Harrington Community Action Group Inc (HCAG) was received in response to this exhibition. Following a presentation from Bob Smith from the HCAG on their submission to MECCAC at its meeting on Thursday 8 May 2014 the revised table was adopted as exhibited [with a status update to Item 23].

TABLE 3: MANNING RIVER ESTUARY MANAGEMENT PLAN - IMPLEMENTATION SCHEDULE – February 2014 version as exhibited and adopted

ITEM	RECOMMENDED STRATEGY	PRIORITY RANKING	ACTIONS	EST. COST	SUGGESTED RESPONSIBILITY	STATUS
PLANNING CONTROLS AND POLICIES						
1	Preparation of a comprehensive land use plan	**1**	1. Development of the Local Plan under the new Planning Act to identify areas of future urban development and high conservation value.	n/a	GTCC	Not commenced.
2	Ensure Council planning staff are briefed on the contents of the Manning River Estuary Management Plan and aware of the impacts of planning decisions on estuary water quality and recent changes in legislation and policies for urban development along the Manning River Estuary	**2**	1. Strategy to target new staff arriving at Council 2. Undertake training activities every 6 months, including a one-day seminar/ workshop and distribution of a brief training manual 3. Increase communication between departments	$4,000 annually	GTCC	1. Not commenced. 2. Not commenced. 3. Commenced – regular meetings set up between Development Services and Landuse Planning Teams to discuss issues such as this.
3	Prepare an Integrated Water Cycle Management Plan based on the recommendations of the Integrated Water Cycle Management Strategy	**2**	1. Review and identify actions from IWCMS that have been previously undertaken to determine outstanding tasks for inclusion in the Plan 2. Incorporate Water Sensitive Urban Design (WSUD) principles into the Plan 3. Undertake public exhibition of draft Plan document 4. Finalise and adopt IWCM Plan 5. Implement Integrated Water Cycle Management Plan	$10,000	MCW GTCC	Awaiting advice from MCW.
4	Incorporate Water Sensitive Urban Design (WSUD) principles and requirements into planning documents	**2**	1. Liaise with Council planners, building inspectors, local developers and the community to set criteria for new development. 2. Incorporate provisions into Local Plan under new Planning Act.	$5,000	GTCC (with assistance from OEH)	1. Commenced. Discussion with Great Lakes Council continuing in regard to having standard provisions across the 2 councils. 2. Not commenced.
5	Incorporate provisions to address Acid Sulfate Soils (ASS) management and rehabilitation into relevant planning	**1**	1. Develop and include a policy of requiring development to avoid areas of Potential ASS wherever possible and	$3,000	GTCC	1. Completed. 2. Completed - ASS clause

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	documents		that if development is proposed in an area of PASS, mitigation measures should be incorporated as a condition of development consent 2. Incorporate Acid Sulfate Soils provisions into Local Plan under new Planning Act. 3. Keep ASS Drain Maintenance Guidelines up to date to reflect changing legislation and best practice methods.			included in LEP 2010. 3. ASS Drain Maintenance Guidelines included as Appendix I to DCP 2010 and currently being updated.
6	Request that a representative from the Manning River Commercial Fishers Association report to the Estuary Management Committee on the implementation of the Association's Environmental Management System for the Manning River Commercial Fishery.	**2**	1. Regular reports on the implementation of the Environmental Management System every 12 months	n/a	MRCFA	1. MECCAC need to request MRCFA to report to the committee on this.
7	Review provisions for the protection of wetlands and vegetation communities on the Manning River floodplain	**1**	1. Undertake site investigations to ground-truth the extent of SEPP 14 wetlands and potential Endangered Ecological Communities (EECs) and incorporate into GIS mapping 2. Incorporate revised mapping for wetlands and EECs into land use mapping for environmental protection within the Local Environmental Plan 2010 3. Incorporate provisions into Local Plan under new Planning Act.	$20,000	GTCC (with support from OEH & LLS)	1. SEPP 14 mapping for Old Bar completed and EEC mapping undertaken by HCCREMS for Old Bar & Hallidays Point. 2. Revised Old Bar SEPP 14 mapping included in LEP 2010, though EEC mapping not a layer in LEP. 3. Not commenced.
8	Consider development controls limiting development within a 40m riparian buffer and adjacent to environmentally significant land.	**2**	1. Consider for inclusion in Local Plan under new Planning Act.	n/a	GTCC	1. Local provisions not commenced, however *NSW Water Management Act* provides controls to protect riparian zones within new developments.

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9	Take an adaptive approach towards planning and development design to cater for sea level rise within planning documents.	**2**	1. Floodplain Management Committee for Manning River to report to MECCAC regarding the adoption of increased flood planning levels for coastal inundation 2. Review appropriate scientific research to validate incorporation of additional floor level requirements for new development 3. Investigate the rezoning or strategic purchase of land to account for sea level rise and its impacts on existing and future development and riparian vegetation and ecosystems (refer outcomes of **Strategy 22**) 4. Take SLR into consideration in development of the Local Plan under the new Planning Act 5. Monitor river levels to determine whether locally significant sea level rise is occurring.	$15,000	GTCC OEH Lands	1. Not commenced. 2. Legal advice to local government recommends adopting the previous NSW govt benchmarks unless significant additional studies undertaken. 3. Understand that State and Federal Government have decided policy stance not to purchase land impacted by SLR or coastal erosion. 4. Not commenced. 5. River height levels monitored at station at Croki.
ON-GROUND WORKS						
10	Construct fencing along creeks and rivers in the estuary where livestock access the river	**1**	1. Undertake independent audit of existing stock fencing along waterways 2. Using the results of the audit and current/proposed land use mapping, identify and prioritise areas for fence installation within the immediate estuarine catchment 3. Source funding from LLS to fence priority riparian zones 4. Liaise with private landholders during planning & implementation of fencing works	$60,000 annually	LLS GTCC	LLS welcomes and assesses each Request for Assistance individually and supports landholders in all ways possible in achieving good outcomes for estuarine riparian projects across the region. LLS provides support to landholders seeking funding and as such has achieved excellent outputs in areas on Mitchells Island and Glenthorne. LLS also provides technical support to Council to implement Riparian estuarine works such as under the recent Urban Sustainability Program that acted on LLS and other inputs. LLS is not resourced to undertake audits of all issues on a landscape

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						scale. LLS is currently undertaking a scheduled CAP review which will inform a 'spatial' CAP. From this LLS could provide spatial reference for sites funded in the Lower Estuary if required. The Hunter LLS extends from Diamond Head in the north to Box Head in the south and the upper Hunter reaches under its Catchment Action Plan. Issues are prioritised strategically. The Lower Manning Estuary often does not meet CAP priority targets, but may in some cases, e.g. where native vegetation regeneration is done to 30m wide, or where people have participated in farm plan courses. Therefore, full assessment of the Manning Estuary is not a current strategic priority to the LLS.
11	Create habitat to encourage mangrove growth at bank erosion sites throughout the estuary	**1**	1. Identify and prioritise sites where mangrove stands have declined with reference to results from **Strategy 16** 2. Undertake planning and design for habitation sites, including any minor bank stabilisation or rock protection works 3. Undertake works to establish mangrove habitat sites 4. Monitor growth of mangrove stands at habitat sites	$40,000 annually	LLS + landholders (with assistance from GTCC)	The LLS strategically assist landholders to achieve improvements which lead to outcomes with high catchment benefits, ensuring that publically funded works provide benefits such as Mangrove and Saltmarsh habitat. Works are voluntary by landholders, and all sites which the LLS has funded or provided input to at least incorporate a view to recreating estuarine habitat. The LLS does not support works which solely protect assets with no estuarine habitat benefit. Monitoring is a requirement for all LLS contracted sites. A number of riverbank restoration projects have been undertaken on private land with funding assistance

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						provided by Council & the Environmental Trust to address priority erosion sites within the Lower Manning River. Bank stabilisation works by Council (funded by the Environmental Trust) have also been undertaken on public land at Cundletown and Pampoolah. The design of these works enables the establishment of mangroves.
12	Investigate and locate historic river usage remnants including wrecks of old vessels, ballast heaps, river pools, jetties/wharves and ferry approaches.	**3**	1. Investigate/identify historic river remnants. 2. Mark historic navigational hazards. 3. Research history of remnants and create a register of historic river items. 4. Consider possible heritage listing of register items.	$50,000	GTCC RMS	Not commenced - new action.
13	Prepare Masterplans for the Manning Point and Croki foreshores as well as other river villages	**3**	1. Audit foreshore facilities and prepare a Masterplan for priority river villages taking into consideration possible improvements. 2. Undertake community consultation to refine proposed improvements. 3. Develop a register of foreshore facilities. 4. Identify and construct trails along river village foreshore areas including historic interpretive signage. 5. Develop tourist pamphlets showing foreshore facilities.	$75,000	GTCC RMS Lands	Partly completed - an audit of boating facilities in foreshore areas has been undertaken as part of the Manning Valley Boating Infrastructure Plan (GTCC, 2012) A Village Plan has been prepared for Coopernook by GTCC – plans for other foreshore areas are outstanding. Council has prepared a Community Land PoM for all its land, whilst Lands have adopted the Manning Regional Crown Reserve Plan of Management. These documents will inform individual Masterplans.
14	Funding to be sought to implement priority dredging identified in the Manning River Maintenance Dredging	**1**	1. Pursue funding options to undertake priority dredging. 2. Detail design investigations and	$10,000 + dredging costs	GTCC FIMG	Extreme priority dredging areas completed in 2012/2013. High priority areas next to be

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	Strategy 2012.		approvals to proceed upon procurement of funding 3. Undertake dredging works		Lands	undertaken under an MOU with the FIMG.
INVESTIGATION AND RESEARCH						
15	Identify, preserve and protect indigenous and non-indigenous heritage sites throughout the estuary	**1**	1. Liaise with the Local Aboriginal Land Council(s) and OEH to identify indigenous sites along the estuary 2. Prepare and review mapping for sites of significance 3. Liaise with the GTCC Strategic Heritage Advisory Committee (SHAC) to ensure that all heritage sites on Manning River estuary are included in the Heritage Strategic Plan for the Greater Taree area 4. Development Management Plans for significant heritage sites	$60,000	SHAC, OEH & LALCs	Not commenced. The ability to identify sites of Aboriginal Cultural Heritage and known location of Aboriginal artefacts was included within the NSW LEP template though current policy position from P&I, OEH and PTLALC is not to publish known sites or include in LEP 2010.
16	Undertake a field survey to ground truth the mapped extents where foreshore vegetation has been removed along the estuary and its tributaries and the resultant impact upon bank stability	**2**	1. Undertake inspection of estuarine foreshore vegetation in the upper catchment to ground truth the updated extant vegetation mapping produced by the Lower Hunter Central Coast Regional Environmental Management Strategy using aerial photographs from 2000 and 2001 2. Revise GIS layers if changes have occurred since previous air photos were taken 3. Use ground-truthed GIS layers to identify and prioritise foreshore areas for restoration works based upon areas with poor bank stability being of higher priority 4. Seek funding to implement restoration works 5. Restoration works to be undertaken in	$15,000	GTCC LLS Landcare	Not commenced. Some mapping of Riparian Vegetation has been undertaken under a State funded wetland project, but it is believed much of this is extrapolated or remote-sensed mapping rather than a product of on-ground surveys. LLS strategic priorities for riparian rehabilitation and revegetation projects are based on vegetation quality and connectivity, geomorphic condition and recovery potential (high recovery potential), and whether sufficiently wide corridors/ projects that can be protected in the long term (PVPs) are achievable, which are confirmed by staff on site per requests by landholders. LLS is supporting Landcare groups such as Manning Landcare to undertake strategic riparian projects and

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			cooperation with LLS and Landcare groups			undertakes many riparian projects throughout the region on a yearly basis.
17	Review the *Manning River Bank Management Study (1997)* *[to be undertaken in conjunction with above action]*	**2**	1. Identify bank management works that have not been completed since preparation of the1997 Bank Management Study 2. Identify areas where works have been inappropriate or ineffective 3. Apply recent bank management techniques to the design of outstanding works 4. Develop revised schedule of works and determine associated costs for outstanding works 5. Seek funding to implement works 6. Undertake bank management works	$20,000 plus construct. costs	LLS GTCC Landowners	Review of MRBMS and priority sites has commenced in house by GTCC. GTCC continues to apply for funding to implement riverbank restoration works, most recently at Wingham and Glenthorne. LLS do not have resources available to implement this action. Lower Manning Estuary in-stream works cannot be funded by the LLS (CAP Management Target #20 – not currently funded for structural works).
18	Obtain catch / effort data from the Anglers Catch Research Program for Australian Bass recorded at the annual Manning River Bass catch event to determine changes in fish stocks	**2**	1. Compile data recorded at Manning River Bass catch events 2. Assess changes in bass numbers every 5 years 3. If required, provide recommendations to mitigate decline of fish numbers	$10,000	NSW DPI Fisheries (with assistance from GTCC, ACRP and Native Fish Australia)	MCW has engaged Dr Keith Bishop for several years now to do environmental flow research, which has included bass monitoring over the last 5 years. Information available at http://www.midcoastwater.com.au/site/index.cfm?display=309059 Fisheries' Danielle Ghosn (Project Coordinator - Recreational Fishing Tournaments Surveys) is responsible for collating the Bass catch data. (Note the two data sets are different in that Dr Bishop's work provides indicators of fish *abundance,* whereas the Bass catch data reflects fish *catch rates*).

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19	Undertake a detailed survey of fish populations, determine the recreational and commercial fishing industry catch impacts throughout the Manning River Estuary and devise management solutions where reduction in fish stocks are observed.	**3**	1. Undertake roving creel survey of recreational fish species in the Manning River 2. Collate information and report on fish abundance 3. Use gathered data to determine primary productivity of the estuary 4. Undertake survey of fish abundance every 3 to 5 years to determine any changes in species or distribution 5. Undertake management actions as necessary to control fishing, including investigation of alternative commercial harvesting methods 6. Undertake a survey of benthic fauna in the estuary based upon an opportunistic basis (e.g. possible University thesis project)	$80,000	NSW DPI Fisheries	On-going. The Fisheries NSW representative has advised it is unlikely that the department has the intent to complete all of the actions identified at this time. Commercial fisheries management on the Manning (as with other NSW estuaries) is guided by the Estuary General Fisheries Management Strategy (2006). The strategy includes performance indicators, and trigger points for review. The fishery is currently regulated largely via various *input* controls including licences, gear restrictions, temporal and spatial closures. Historical catch data for the estuary is available. Recreational fishing is also managed on a state wide basis via input controls including size limits, gear restrictions, and some closures. An important additional *output* control is the application of bag limits. A state wide recreational fishing survey was last conducted in 2001 and a new survey will be conducted during 2013-2014. This will include data that can be evaluated at a regional level. The other source of recreational catch data rests with local fishing clubs, though its value for statistical analysis may be limited. The *Status of Fisheries Resources* is a report that is published by the department every two years and it provides an overview of the state of estuarine

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						and marine fish populations that are harvested by both commercial and recreational fishers. Note that the majority of species targeted by fishers on the Manning are assessed as 'fully fished'. A notable exception is mulloway which is classified as 'over fished'. A recovery program has recently been released for that species (Nov 2013).
20	Continue investigations into management of Acid Sulfate Soils (ASS) and drainage from areas of ASS.	**1**	1. Use findings from existing study into floodgate impacts and blockages by LLS in conjunction with inventory of floodgates compiled by DPI Fisheries 2. Determine likely impact of floodgates and drains on fish passage and water quality processes, including mobilisation of acidic runoff 3. Investigate potential to modify or remove existing drains, including voluntary purchase of land and methods to reinstate natural systems, such as wetlands 4. Prepare Acid Sulfate Soils (ASS) remediation action plans for the priority areas identified in DLWC report: 'Acid Sulfate Soil Management Priority Areas in the Lower Manning Floodplain' (Tulau, 1999) 5. Assess rehabilitation measures in terms of feasibility and environmental impact 6. Seek funding to implement measures	$80,000 annually	GTCC & LLS (with assistance from DPI Fisheries & OEH)	Commenced. Council, DPI Fisheries (with funding provide by LLS) and NSW Environmental Trust have funded replacement of floodgates at appropriate levels throughout lower Manning River estuary enabling better tidal exchange, fish passage and ASS management. Work at Cattai Wetlands in regard to ASS management well advanced, while implementation of the Big Swamp project is also underway.
21	Undertake an Industrial Assessment of all agricultural practices adjacent to waterways within the catchment to ensure best management practices are	**1**	1. Compile list of agricultural practices for assessment 2. Determine framework with which to	$80,000	DPI GTCC OEH	Not done by the LLS. LLS does however work with DPI to address key agricultural management issues in the region, funding a large

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	being adhered to for all intensive activities such as feedlots, dairies and piggeries		assess each practice 3. Undertake assessment of selected farms 4. Analyse results of assessments to identify practices that require improvement 5. Target identified sites as part of education program in **Strategy 33** 6. If required, enforce legal requirements for practices		Office of Water LLS	amount of sustainable agriculture, nutrient management, environmental management systems projects and delivers education on best practice, coupled with case studies and best practice notes, to agricultural landholders on a yearly basis. Once landholders have done an Integrated Land Management Planning course endorsed / delivered by the LLS, landholders can apply for funding to implement on ground best practice works.
22	Model coastal inundation in relation to a range of predictions for sea level rise	**2**	1. Use current sea level rise predictions to assess impact on estuary processes 2. Account for impacts of sea level rise when implementing estuary management strategies. 3. Monitor work being undertaken by Intergovernmental Panel on Climate Change and CSIRO to predict sea level change 4. Revise estuary management objectives and future strategies to account for predicted sea level change	$50,000	GTCC (with assistance from OEH)	Not commenced. State Govt no longer stands by its previous SLR benchmarks and has decided that this is an issue for each local government area. Legal advice to local government recommends adopting the previous NSW govt benchmarks unless significant additional studies undertaken
23	Undertake environmental investigations into the relocation and re-design of the Gantry at Harrington Back Channel to potentially reduce coastal erosion at Manning Point	**2**	1. Undertake an environmental study into whether the relocation of the gantry will result in a reduction in coastal erosion at Manning Point 2. Undertake feasibility study of construction works, to determine the cost and associated benefit 3. If option is feasible, prepare an Environmental Impact Statement for the works, considering flood impacts and ecological impacts 4. Subject to the outcomes of above	$80,000 for env study $20,000 for feasibility study $50,000 for EIS plus construct	Lands GTCC RMS	Council applied in March 2014 to OEH for a grant in the 2014/15 financial year to undertake Action 1.

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			actions, prepare concept and detail designs for the works 5. Undertake works	costs		
	Prepare a Manning River Entrance Management Plan for Harrington	**2**	1. Undertake an environmental study (including an economic assessment) to determine the impact on the entrance of removing the northern break wall and leaving in a natural state and possibly manually opening if entrance closes versus constructing a southern break wall to have a permanently open entrance. 2. Undertake community consultation 3. Adopt the Management Plan. 4. Seek funding to undertake any designs & approvals and implement the management recommendation.	$150,000 plus implement costs	GTCC Lands OEH	New action - not commenced.
24	Map seagrass, saltmarsh and mangroves throughout the estuary	**1**	1. Undertake survey to ground truth current seagrass extent (approach Universities for assistance for research projects) 2. Compare GIS layer of current seagrass extent with GIS data held by Council corresponding to extent of seagrass last surveyed in 1984 3. Investigate impact of previous dredging works on seagrass extent in the lower Manning River 4. Investigate mitigation measures if seagrass extent found to be significantly decreased due to anthropogenic influences	$25,000	GTCC (with assistance from University research project) DPI Fisheries OEH	Not commenced. NSW Fisheries have mapping available of seagrasses.

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MONITORING						
25	Develop a water quality monitoring program for Manning River tributaries in the lower estuary to complement existing monitoring activities by Council, MidCoast Water and Waterwatch groups	**1**	1. Monitoring program to determine the impact of catchment activities on nutrient levels in the lower Manning River estuary 2. Compile existing water quality data from Council monitoring activities for Gross Pollutant Traps and for the lagoons at Manning Point and Farquhar Park 3. Compile existing water quality data from 15 sites monitored by MidCoast Water (spanning 18 years) 4. Compile existing water quality data from the Waterwatch database, subject to reliability of the data 5. Extract relevant water quality data from database compiled by the Water Quality Partnership 6. Combine existing data into GIS mapping base that shows the location of all previous sampling sites 7. Use the available water quality data to develop a base level water quality data set 8. Additional water quality monitoring to be undertaken at the following 6 sites: – Lansdowne River near Lansdowne and at the confluence with Manning River – Dawson Creek at the confluence with Manning River and 8 km upstream from the confluence – at the tidal limit of Manning River and 10 km upstream from the tidal limit 9. Monitoring to focus on parameters that demonstrate the presence of nutrients	$20,000 plus $55,000 annually	GTCC, MCW, LLS	MCW has done some, not all. Status of listed actions: 1. GTCC has received funding through the Estuary Management Program to undertake water quality monitoring in the Manning Estuary. MCW has data available from ongoing monitoring 2. Previous GTCC stormwater officer undertook this. GTCC Manning Estuary Report Card will replace this. 3. Complete. 4. Waterwatch data is patchy in the Manning Estuary. The only current ongoing monitoring is undertaken by GTCC at Cattai/Big Swamp. 5. The water quality database has not been contributed to by any other agency than MCW. 6. MCW sites in MCW GIS system 7. GTCC Manning Estuary Report Card will set this 8. Completed, MCW undertake this sampling 9. MCW monitoring focuses on licensing requirements. Nutrients and FCs are part of this. 10. Sampling at MCW sites is every 2 months 11. Not yet commenced. 12. This is being done as part of MCW catchment research but the focus is on the drinking water catchment above Bootawa not on the estuary, so the impact of towns like Taree and Wingham

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			and faecal contamination 10. Sampling to be undertaken monthly and following rainfall events 11. Incorporate newly collected water quality data into GIS mapping 12. Use total water quality data set to assess the impact of agricultural activities and urban runoff on nutrient levels in the Manning River 13. pH monitoring of ASS hotspot locations			are not being considered. Reports available at following link: http://www.midcoastwater.com.au/site/index.cfm?display=309068 13. Undertaken by GTCC at Cattai Wetlands and Big Swamp.
26	Undertake **ongoing** monitoring of faecal coliforms throughout the estuary, to monitor for the presence of pathogenic organisms that may present a public health risk and to assess the health of the estuary	**1**	1. Monitoring to include sites in the vicinity of outfalls from sewage treatment plants at: - Taree - Wingham - Manning Point - Harrington - Lansdowne - Coopernook - Gloucester - Dawson	$25,000 annually	MCW Oyster Industry GTCC	Faecal coliforms (not *E. coli*) are measured at all of these. Macro invertebrates are not measured – they are a scientifically developed method of monitoring water quality in fresh water not in estuaries. Oyster businesses also undertake FC monitoring as part of NSW Food Authority requirements.
EDUCATION AND COMMUNITY INVOLVEMENT						
27	Work with landholders on **ongoing** basis to revegetate the riparian zone on private land along waterways within the Manning River Estuary	**1**	1. Identify priority areas for revegetation within the immediate estuarine catchment (refer to outcomes of review of Manning River Bank Management Study - **Strategy 17**) 2. Supply tube sock to revegetate priority riparian areas 3. Liaise with landholders and local Landcare and Coastcare groups to assist in the revegetation of priority areas 4. Encourage landholders to conserve existing native remnant vegetation and to enter into Voluntary Conservation	$50,000	LLS, GTCC & Landcare	Commenced. A number of riverbank restoration projects have been undertaken on private land with funding assistance provided by Council & the Environmental Trust to address priority erosion sites within the Lower Manning River. LLS identified this priority in the Catchment Action Plan and provides grants for landowners and assistance in identifying appropriate works.

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			Agreements, Biodiversity Management Agreements or Property Vegetation Plans 5. Continue work as part of Council's Community Nursery program 6. Assist in the development of community networks			
28	Prepare an education program to inform community of current flood notch protocols	**3**	1. Education program to target Old Bar community and oyster growers 2. Create education brochures explaining the procedures for maintenance of the flood notch and its purpose. Include details of environmental benefits	$5,000	GTCC	Not commenced.
29	Encourage landholders to enter into Property Vegetation Plans (PVPs) with the Hunter Central Rivers Catchment Management Authority	**2**	1. LLS to establish trial of three sites for development of PVPs 2. LLS officer to undertake site inspections and advise landholders 3. Prepare draft Plans using "PVP Developer" 4. LLS to review and assess Plans 5. Approval of PVPs by LLS 6. Advertise and exhibit trial sites to encourage additional landholders to develop PVPs 7. LLS to report and update progress of PVP development to Estuary Management Committee	$15,000	LLS (with assistance from GTCC)	Commenced. LLS does not see a requirement for 'specific' trial sites, as PVPs are delivered in both upper and lower catchment areas where they meet strategic priorities and the LLS is able to resource these. Local lower catchment PVP examples include: one recent PVP over an estuarine-wetland site at Pampoolah & one 110ha site at Coolongolook. GTCC has also entered into a PVP for Cattai Wetlands, which is open to the public 4 days/week.
30	Conduct field days for riparian landholders at demonstration sites to raise awareness of the importance of riparian vegetation	**2**	1. Publish media article advising of completion of works at demonstration sites and advise of field days 2. Send invitations to all riparian property owners to field days at demonstration sites 3. Undertake field days, taking the	$8,000	LLS (with assistance from GTCC)	LLS conducts field trials, demonstrations and training days throughout the year aimed at raising awareness of the importance of riparian vegetation. LLS employs a Riparian Officer who assists and educates all sectors of the community through face to face contact and field visits on

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			opportunity to distribute educational brochures by hand			an on-going basis, including working with other agencies and councils. LLS also publishes Project Summary Sheets on vegetation trials being conducted by Vegetation and Riparian staff. Many landholders throughout the year are seen as groups or individuals to help them learn about best practice techniques where LLS staff devise specific vegetation management plans.
31	Introduce an **ongoing** community recognition and local awards scheme for efforts towards biodiversity conservation	**2**	1. Publish media article advising rural land owners, community groups and schools of awards scheme and request nominations 2. Identify suitable nominees for recognition by undertaking site inspections of nominated properties 3. Invite all participants to presentation via a media article and direct mail 4. Present awards 5. Encourage further nominations by fellow landholders and community groups	$5,000	LLS	Commenced. Champions of the Catchment Awards run each year by the LLS.
32	Develop a community education program that outlines the importance of estuary processes and the potentially adverse impacts of human activities	**2**	1. Develop a community education program that outlines the importance of estuary processes and the potentially adverse impacts of human activities (i.e. untreated and uncontrolled stormwater runoff, clearing of vegetation) 2. Develop and distribute targeted brochures to selected community groups and estuary users (e.g. residents, tourists, recreational fishers) outlining potentially adverse impacts. 3. Organise media coverage of on-the-ground works as they are carried out	$20,000	GTCC OEH LLS MCW	1. MCW does this through the Waterwatch program. LLS undertakes community education such as: Case Study development, media, Water Watch support, Catchment News, publications such as Where Land Meets Water, field days and through a large number of rural landholder primary producer groups through the LLS's Integrated Land Management and Environmental Management System programs. 2. Not commenced. 3. Ongoing as part of each project for on-

ITEM	RECOMMENDED STRATEGY	PRIORITY RANKING	ACTIONS	EST. COST	SUGGESTED RESPONSIBILITY	STATUS
			and achievements in the implementation of this Plan. 4. Develop a Report Card for the Manning River on estuary health.			ground works. 4. Successful grant application submitted by GTCC under the NSW Estuary Management Program for funding to implement this action.
33	Prepare and undertake a targeted community education program for rural property owners to make them aware of best management land-use practices, such as: – Minimisation of slope erosion; – Minimisation of gravel loss and bank erosion at river crossings; – Controlling cattle access to waterways; – Minimisation of vegetation clearing; – Replanting of native catchment and riparian vegetation; – Appropriate application (timing and locations) of fertilisers; and – Installation of sediment traps.	**2**	1. Post "expression of interest" brochures / letters to all rural property owners to identify interested parties, availability and topics for discussion 2. Make follow-up phone calls to potential participants 3. Publish a media article inviting all rural property owners to workshops 4. Undertake workshops for rural property owners at local community hall 5. Distribute industry-specific education brochures to all landholders 6. Encourage rural landowners to develop Property Vegetation Plans	$25,000	H-CR LLS (with assistance from GTCC and OEH)	LLS publishes Project Summary Sheets on vegetation trials being conducted by Vegetation and Riparian staff. Many landholders throughout the year are seen as groups or individuals to help them learn about best practice techniques where LLS staff devise specific vegetation management plans. LLS also employs a Soil Officer who works in a similar way to the Riparian Officer, but assisting landholders in dealing with on-site erosion issues, and employs an officer who works with dairy, beef and other industry groups to achieve the listed '43' targets. The LLS funds many riparian vegetation and soil erosion projects throughout the whole catchment during the year.

ITEM	RECOMMENDED STRATEGY	PRIORITY RANKING	ACTIONS	EST. COST	SUGGESTED RESPONSIBILITY	STATUS
34	Construct interpretative signs based upon a combined sign template at key locations throughout the estuary to provide education on the potentially adverse impacts of human activities on the environmental health of the estuary, particularly stormwater pollutants and disturbance of the riparian zone	**3**	1. Develop a combined sign template which incorporates fish species relevant to the Manning River. 2. Erect signs at key locations of estuary usage and where the estuary may be impacted by human activities: – Foreshore reserves – Boat ramps – Wetland areas 3. Mark existing stormwater inlet pits with message, "This drains to Manning River" (or applicable equivalent) in 100mm high bold yellow lettering. 4. Rationalise existing signage at sites by using the combined sign template.	$18,000	GTCC DPI Fisheries RMS Lands NPWS	Commenced. Successful grant application submitted by Council under the NSW Estuary Management Program in March 2012 for funding to implement parts 1 & 2 of this action.
COMPLETED ACTIONS – Planning Controls and Policies						
8	In conjunction with the recommendations of the Department of Land's Crown Lands Assessment, identify and protect significant reserve sites throughout the estuary and linkages of vegetation through Crown Land management plans and Council planning legislation		1. Liaise with the Department of Lands to identify and protect significant Crown Reserves within the Manning River estuary that do not have a current Plan of Management. 2. Prepare draft Plans of Management for appropriate sites. 3. Undertake community consultation to obtain community feedback on draft Plans of Management. 4. Finalise reports. 5. If appropriate, incorporate reserves into land use mapping as part of Local Plan 2008	$50,000	Lands / GTCC	Completed.
11	Undertake a review of the existing Plans of Management for SEPP 26 littoral rainforests along the Manning River		1. Review existing Plans of Management for SEPP 26 littoral rainforest areas along the Manning River Estuary to identify works successfully completed	$15,000	GTCC (with assistance from Lands)	Completed.

ITEM	RECOMMENDED STRATEGY	PRIORITY RANKING	ACTIONS	EST. COST	SUGGESTED RESPONSIBILITY	STATUS
			under the individual Plans 2. Identify and prioritise works and management activities from the individual PoMs that are yet to be implemented 3. Review availability and distribution of funding for management tasks 4. If required, seek additional funding 5. Implement outstanding management activities and tasks.			
13	NSW Maritime to prepare or commission the preparation of a Boating Plan for the Manning river		1. Request that Manning River be included on the priority list for Boating Plans in the NSW Boating Plan of Management Strategy for 2008 and beyond 2. If Manning River is selected for a Boating Plan, review existing boating facilities and infrastructure (last completed in 1990) 3. Investigate waterway usage and potential user conflicts, including the impact of boat usage on river bank erosion 4. Incorporate additional boating facilities to encourage increased boating on the Manning River 5. Undertake community consultation during preparation of Boating Plan 6. 6. Prepare generic Review of Environmental Factors for maintenance dredging to aid navigation	$50,000	NSW Maritime (with assistance from GTCC)	Completed.

ITEM	RECOMMENDED STRATEGY	PRIORITY RANKING	ACTIONS	EST. COST	SUGGESTED RESPONSIBILITY	STATUS
COMPLETED ACTIONS – On-ground Works						
17	Dredge the navigation channel at identified rowing course adjacent to Shallow Island		1. Develop a concept design for dredging works based on latest available bathymetric survey 2. Undertake appropriate assessment of environmental impacts of proposed dredging works 3. Undertake community consultation to gather community response to proposed works 4. Subject to environmental and community approval, prepare detail designs for dredging 5. Undertake dredging works, including all measures to minimise environmental impact	$80,000 plus cost of dredging	GTCC / RMS	Completed.
COMPLETED ACTIONS – Investigation and Research						
31	Council in partnership with State Government to prepare an Entrance Opening Management Plan for Farquhar Inlet		1. Compile and review all previous documentation regarding the Farquhar Inlet and the existing sedimentary processes 2. If required, undertake additional data collection 3. Prepare and assess protocols for maintaining an open entrance at the inlet, including consideration of environmental impacts & estimated cost of maintenance 4. Prepare management plan to document the findings of investigations and recommendations for protocols for maintaining an opened entrance.	$30,000	GTCC & OEH	Completed.

List of acronyms used in Table 3

DPI – Fisheries	- NSW Department of Primary Industries – Fisheries Division
FIMG	- Farquhar Inlet Management Group
GTCC	- Greater Taree City Council
LALCS	- Local Aboriginal Land Councils
Lands	- NSW Department of Primary Industries – Crown Lands Division
LLS	- Hunter-Central Rivers Local Land Services (formerly known as Catchment Management Authority (CMA))
MCW	- MidCoast Water
MECCAC	- Manning Estuary Coastline and Catchment Advisory Committee
MRCFA	- Manning River Commercial Fishers Association
NPWS	- NSW Office of Environment and Heritage – National Parks & Wildlife Service
OEH	- NSW Office of Environment and Heritage
RMS	- NSW Roads and Maritime Services
SHAC	- Greater Taree City Council Strategic Heritage Advisory Committee

Implementation Prioritisation Spreadsheet

	Criteria rankings: HIGH = 3 MEDIUM = 2 LOW = 1	CRITERIA 1 - Significance - (HIGH) = International Significance - RAMSAR/JAMBA/CAMBA (HIGH) = National Significance - EPBC Act (MEDIUM) = State Significance - Legislation/policies/strategies (LOW) = Regional/Local Significance - strategies/policies/LEP/DCP/CAP	CRITERIA 2 - Risk/Benefit - (HIGH) = Safety/Health, Large area (MEDIUM) = distinct geographical area/ management unit (LOW) = isolated, localised	CRITERIA 3 - Cost (HIGH) = within capacity of lead agency and major partner (MEDIUM) = Possible if additional grants available (LOW) = no funding available	Criteria 4 - Timeframe 3 = urgent (< 3yrs) 2 = Consistent problem (within 5 years) 1 = Less Urgent/long term benefit (5-10 yrs)	Total Score	Overall Priority 9-12 = H (1) 7-8 = M (2) 4-6 = L (3)
Number	Strategy						
1	Preparation of a comprehensive land use plan	1	3	3	2	9	H (1)
5	Incorporate provisions to address Acid Sulphate Soils (ASS) management and rehabilitation into relevant planning documents	2	3	3	3	11	H (1)
7	Review provisions for the protection of wetlands and vegetation communities on the Manning River floodplain	3	3	2	2	10	H (1)
10	Construct fencing along creeks and rivers in the estuary where livestock access the river	1	3	2	3	9	H (1)
11	Create habitat to encourage mangrove growth at bank erosion sites throughout the estuary	1	3		3	9	H (1)
14	Funding to be sought to implement priority dredging identified in the Manning River Maintenance Dredging Strategy 2012.	1	3	2	3	9	H (1)
15	Identify, preserve and protect Indigenous and non-indigenous heritage sites throughout the estuary	3	3	2	2	10	H (1)
20	Continue investigations into management of Acid Sulphate Soils (ASS) and drainage from areas of ASS.	1	3	2	3	9	H (1)
21	Undertake an Industrial Assessment of all agricultural practices adjacent to waterways within the catchment to ensure best management practices are being adhered to for all intensive activities such as feedlots, dairies and piggeries	1	3	2	1	9	H (1)
24	Map seagrass, saltmarsh and mangroves throughout the estuary	2	3	2	2	9	H (1)
25	Develop a water quality monitoring program for Manning River tributaries in the lower estuary to complement existing monitoring activities by Council, MidCoast Water and Waterwatch groups	1	3	2	3	9	H (1)

	Criteria rankings: HIGH = 3 MEDIUM = 2 LOW = 1	CRITERIA 1 - Significance - (HIGH) = International Significance - RAMSAR/JAMBA/CAMBA (HIGH) = National Significance - EPBC Act (MEDIUM) = State Significance - Legislation/policies/strategies (LOW) = Regional/Local Significance - strategies/policies/LEP/DCP/CAP	CRITERIA 2 - Risk/Benefit - (HIGH) = Safety/Health, Large area (MEDIUM) = distinct geographical area/ management unit (LOW) = isolated, localised	CRITERIA 3 - Cost (HIGH) = within capacity of lead agency and major partner (MEDIUM) = Possible if additional grants available (LOW) = no funding available	Criteria 4 - Timeframe 3 = urgent (< 3yrs) 2 = Consistent problem (within 5 years) 1 = Less Urgent/long term benefit (5-10 yrs)	Total Score	Overall Priority 9-12 = H (1) 7-8 = M (2) 4-6 = L (3)
Number	Strategy						
26	Undertake ongoing monitoring for the biological indicator species, E.coli and macro invertebrate species throughout the estuary, to monitor for the presence of pathogenic organisms that may present a public health risk and to assess the health of the estuary	1	3	2	3	9	H (1)
27	Work with landholders on ongoing basis to revegetate the riparian zone on private land along waterways within the Manning River Estuary	1	3	2	3	9	H (1)
2	Ensure Council planning staff are briefed on the contents of the Manning River Estuary Management Plan and aware of the impacts of planning decisions on estuary water quality and recent changes in legislation and policies for urban development along the Manning River Estuary	1	3	3	1	8	M (2)
3	Prepare an Integrated Water Cycle Management Plan based on the recommendations of the Integrated Water Cycle Management Strategy	1	2	2	2	7	M (2)
4	Incorporate Water Sensitive Urban Design (WSUD) principles and requirements into planning documents	1	2	2	2	7	M (2)
6	Request that a representative from the Manning River Commercial Fishers Association report to the Estuary Management Committee on the implementation of the Association's Environmental Management System for the Manning River Commercial Fishery	1	2	3	1	7	M (2)
22	Model coastal inundation in relation to a range of predictions for sea level rise	1	3	2	2	8	M (2)

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Number	Strategy						
23	Undertake environmental investigations into the relocation and re-design of the Gantry at Harrington Back Channel to potentially reduce coastal erosion at Manning Point **&** Prepare a Manning River Entrance Management Plan for Harrington	1	2	2	3	8	M (2)
8	Consider development controls limiting development within a 40m riparian buffer and adjacent to environmentally significant land	1	3	3	1	8	M (2)
9	Take an adaptive approach towards planning and development design to cater for sea level rise within planning documents	2	3	2	1	8	M (2)
16	Undertake a field survey to ground truth the mapped extents where foreshore vegetation has been removed along the estuary and its tributaries and the resultant impact upon bank stability	1	3	2	2	8	M (2)
17	Review the Manning River Bank Management Study (1997) [to be undertaken in conjunction with above action]	1	3	2	2	8	M (2)
18	Obtain catch / effort data from the Anglers Catch Research Program for Australian Bass recorded at the annual Manning River Bass catch event to determine changes in fish stocks	1	2	3	1	7	M (2)
29	Encourage landholders to enter into Property Vegetation Plans (PVPs) with the Hunter Central Rivers Catchment Management Authority	1	2	3	2	8	M (2)
30	Conduct field days for riparian landholders at demonstration sites to raise awareness of the importance of riparian vegetation	1	2	3	2	8	M (2)
31	Introduce an ongoing community recognition and local awards scheme for efforts towards biodiversity conservation	1	2	3	1	7	M (2)

	Criteria rankings: HIGH = 3 MEDIUM = 2 LOW = 1	CRITERIA 1 - Significance - (HIGH) = International Significance - RAMSAR/JAMBA/CAMBA (HIGH) = National Significance - EPBC Act (MEDIUM) = State Significance - Legislation/policies/strategies (LOW) = Regional/Local Significance - strategies/policies/LEP/DCP/CAP	CRITERIA 2 - Risk/Benefit - (HIGH) = Safety/Health, Large area (MEDIUM) = distinct geographical area/ management unit (LOW) = isolated, localised	CRITERIA 3 - Cost (HIGH) = within capacity of lead agency and major partner (MEDIUM) = Possible if additional grants available (LOW) = no funding available	Criteria 4 - Timeframe 3 = urgent (< 3yrs) 2 = Consistent problem (within 5 years) 1 = Less Urgent/long term benefit (5-10 yrs)	Total Score	Overall Priority 9-12 = H (1) 7-8 = M (2) 4-6 = L (3)
Number	Strategy						
32	Develop a community education program that outlines the importance of estuary processes and the potentially adverse impacts of human activities	1	3	2	2	8	M (2)
33	Prepare and undertake a targeted community education program for rural property owners to make them aware of best management land-use practices, such as: - Minimisation of slope erosion; - Minimisation of gravel loss and bank erosion at river crossings; - Controlling cattle access to waterways - Minimisation of vegetation clearing - Replanting of native catchment and riparian vegetation; - Appropriate application (timing and locations) of fertilisers; and - Installation of sediment traps.	1	3	2	2	8	M (2)
12	Investigate and locate historic river usage remnants including wrecks of old vessels, ballast heaps, river pools, jetties/wharves and ferry approaches.	1	1	2	1	5	L (3)
13	Prepare Masterplans for the Manning Point and Croki foreshores as well as other river villages	1	2	2	1	6	L (3)
19	Undertake a detailed survey of fish populations, determine the recreational and commercial fishing industry catch impacts throughout the Manning River Estuary and devise management solutions where reduction in fish stocks are observed.	1	2	2	1	6	L (3)
28	Prepare and education program to inform community of current flood notch protocols	1	1	3	1	6	L (3)

	Criteria rankings: HIGH = 3 MEDIUM = 2 LOW = 1	CRITERIA 1 - Significance - (HIGH) = International Significance - RAMSAR/JAMBA/CAMBA (HIGH) = National Significance - EPBC Act (MEDIUM) = State Significance - Legislation/policies/strategies (LOW) = Regional/Local Significance - strategies/policies/LEP/DCP/CAP	CRITERIA 2 - Risk/Benefit - (HIGH) = Safety/Health, Large area (MEDIUM) = distinct geographical area/ management unit (LOW) = isolated, localised	CRITERIA 3 - Cost (HIGH) = within capacity of lead agency and major partner (MEDIUM) = Possible if additional grants available (LOW) = no funding available	Criteria 4 - Timeframe 3 = urgent (< 3yrs) 2 = Consistent problem (within 5 years) 1 = Less Urgent/long term benefit (5-10 yrs)	Total Score	Overall Priority 9-12 = H (1) 7-8 = M (2) 4-6 = L (3)
Number	Strategy						
34	Construct interpretative signs based upon a combined sign template at key locations throughout the estuary to provide education on the potentially adverse impacts of human activities on the environmental health of the estuary, particularly stormwater pollutants and disturbance of the riparian zone	1	2	2	1	6	L (3)