

Option ID	Management Goal Addressed	Management Category	Strategy Outline	Location	Zone	Issue(s) Addressed	Primary Responsibility	Secondary Responsibility	Suggested by:	Cross Reference with Option:	Dependency on Option:	Preliminary Estimate of Capital Cost	Preliminary Estimate of Annual Maintenance/Recurrence Cost/Revenue (-ve values)	Net Present Value	Potential Funding Stream	Water & Sediment Quality	Sedimentary Processes	Ecological Processes	Foreshore Flooding/Inundation	Cultural Heritage	Visual Amenity	Recreational Usage	Development	Governance	Information, Communications and Education	Raw Benefit Index	Council / DECCW Response	Adjusted Benefit Index
C13	Foreshore Development	Compliance	Provide additional resources for enforcement of compliance with foreshore development controls.	LGA-wide	All	114, 119, 133, 150, 184, 209, 248	GCC		Community	C02, C14		\$ -	\$ 75,000	\$ 794,551		2	3	3	3	1	1	0	0	0	2	15	1	16
C01	Water and Sediment Quality	Compliance	Continue program of auditing to ensure best management practices for marinas around Brisbane Water Estuary. DECCW's brochure Environmental Action for Marinas, Boatsheds and Slipways should be provided to marine operators.	All marinas	All	73	DECCW, NSW Maritime	GCC	WG			\$ 20,000	\$ 30,000	\$ 337,820		3	2	3	0	0	1	3	0	0	2	14	0	14
C08	Recreational Usage	Compliance	Enforce boating regulations (particularly speed restrictions and zoning of activities) within Brisbane Water.	Waterway-wide	All	14,20,26,44, 169	NSW Maritime		Cardno, Community	E01, E11, W05, C12, C16		\$ -	\$ 50,000	\$ 529,701		2	3	1	0	0	0	3	0	0	3	12	0	12
C14	Foreshore Development	Compliance	Audit existing foreshore development (including property boundaries, fences and other structures, boat houses, boat ramps, jetties, etc.) and identify illegal or non-conforming development for retrospective enforcement of development controls. This should be undertaken in accordance with the Conditions of Consent and relevant policy in force at the time of Development Approval. Where foreshore structures are negatively impacting on estuarine processes (e.g. causing erosion or accretion on adjacent lands), investigation opportunities to mitigate these issues. This may be achieved through the Crown lands lease/licensing mechanism (where relevant).	Estuary Foreshores	All	114, 119, 133, 150, 184, 209, 248	LPMA	GCC	Cardno, Community	C02, C13, P10, P11, P14, P44	R31	\$ 90,000	\$ -	\$ 90,000		1	3	1	2	1	1	0	0	0	2	11	1	12
C02	Water and Sediment Quality	Compliance	Provide additional resources for Council officers to undertake audits of properties to ensure enforcement of policies and conditions of consent relating to water quality during both the construction and operational phases.	Catchment-wide	All	109	GCC		Community	C13, P04		\$ -	\$ 70,000	\$ 741,581		3	3	3	0	0	0	0	0	0	0	9	2	11
C04	Habitat and Species Conservation	Compliance	Ensure ongoing enforcement of fishing regulations.	Waterway-wide	All	99, 100, 159	I&I NSW	Fishcare Volunteers	Community	E01		\$ -	\$ 30,000	\$ 317,820		1	0	3	0	0	0	3	0	0	3	10	1	11
C05	Habitat and Species Conservation	Compliance	Ensure the ongoing enforcement of Council's Tree Vandalisation Policy. Reference should also be made to D6.44 Landscape and Vegetation Management Policy.	LGA-wide	All	71, 251	GCC		Community			\$ -	\$ 25,000	\$ 264,850		1	1	2	1	1	2	0	0	0	2	10	1	11
C15	Information, Communications and Education	Compliance	Enforce littering restrictions and undertake parallel education programs about littering.	LGA-wide	All	79, 186	GCC		Cardno	E02, E07, E11, R05, W91, W92, W93		\$ 20,000	\$ 7,500	\$ 99,455	Butt Littering Trust	2	0	1	1	0	2	0	0	0	4	10	1	11
C07	Recreational Usage	Compliance	Consider opportunities to install additional dinghy storage racks at strategic locations around the estuary. Ensure enforcement of the requirement to use formal dinghy storage racks provided by Council. This should include the confiscation of improperly stored dinghies or fining of the owners.	Estuary Foreshores	All	174	GCC		Community	W77	P35	\$ -	\$ 25,000	\$ 264,850		0	2	1	0	2	2	3	0	0	0	10	0	10
C03	Water and Sediment Quality	Compliance	Work with private land holders / tenants to improve stormwater management practices in the industrial estate near Hawke Street.	Kincumber	5	237	GCC	DECCW	GCC			\$ 15,000	\$ -	\$ 15,000		1	1	1	0	0	1	1	0	0	0	5	1	6
C10	Recreational Usage	Compliance	Enforce on-leash dog walking in restricted areas in line with Councils Dog Policy Review.	Catchment-wide	All	193	GCC		Cardno			\$ -	\$ 30,000	\$ 317,820		-2	0	2	0	0	0	2	0	0	2	4	2	6
C12	Recreational Usage	Compliance	Investigate options for either banning or further limiting the use of jet skis in Brisbane Water Estuary.	Waterway-wide	All	17,69, 163	NSW Maritime	GCC	Community	C08		\$ 12,500	\$ -	\$ 12,500		1	1	1	0	0	0	0	-1	0	0	2	1	3
E08	Information, Communications and Education	Education	Give consideration to methods of detecting and informing the community of changes to sea levels and other potential climate change impacts. These methods should not result in a sense of panic or alarm, instead they should empower the community to act in a well considered and informed manner and where possible, encourage the community to become engaged in Council's decision making processes. The information provided to the public should be supported by research presented by the IPCC and the State/Federal government.	LGA-wide	All	92	GCC	DECCW, CMA	GCC, Community		R40, P43	\$ 25,000	\$ -	\$ 25,000	National Natural Disaster Mitigation Program	1	2	0	5	0	0	0	4	0	5	17	2	19
E07	Information, Communications and Education	Education	Establish a 'Clean Up Brisbane Water Day' with the dual objectives of removing rubbish from the Estuary foreshores and waterways, and of educating the public about the Estuary.	Waterway-wide	All	54	GCC	NSW Maritime, DECCW	Community	C15, E02, E11, R05, W91, W92, W93		\$ 50,000	\$ 50,000	\$ 579,701		3	2	4	0	0	2	0	0	0	4	15	1	16
E09	Information, Communications and Education	Education	Provide foreshore property owners with information/guidelines about what constitutes good and bad practice with respect to foreshore management (e.g. limits of mowing, stabilisation works, etc.). This should include information on environmentally friendly seawall options to both the community and those individuals assessing development applications for these structures. Reference should be made to DECCW's Environmentally Friendly Seawalls. A Guide to Improving the Environmental Value of Seawalls and Seawall-lined Foreshores in Estuaries.	Foreshore Property Owners	All	198,	GCC	DECCW	Community	C02, C05, C14, P11, P14, P44-P50		\$ 30,000	\$ 7,500	\$ 109,455		2	2	3	3	0	1	0	0	0	3	14	2	16
E03	Information, Communications and Education	Education	Develop a public awareness and education program relating to the estuary and its biodiversity. Elements for inclusion in this program may include: - Key habitat types and their ecological function (e.g. saltmarshes, seagrasses), - Biodiversity and threatened and protected species (e.g. migratory birds), - Marine pests and other threats to estuarine ecology, and - The important underlying ecological processes of the estuary and their relationship with human uses of the estuary. This program may include different educational elements such as targeted activities, information days, the preparation of literature and/or interpretive signage.	LGA-wide	All	34, 41, 50, 51, 90, 218 and 250	GCC		Cardno	E08, P19, P20, P23, P28, P53, R20, R22, R25	E03, R39	\$ 100,000	\$ 30,000	\$ 417,820		2	1	4	0	0	-1	1	0	0	5	12	1	13
E02	Information, Communications and Education	Education	Label stormwater drain inlets in problematic areas "This drains to .....".	Catchment-wide	All	12	GCC		Cardno, Community	C15, E07, R05		\$ 20,000	\$ 2,500	\$ 46,485		3	2	3	0	0	-1	0	0	0	4	11	1	12
E11	Information, Communications and Education	Education	Conduct an education program for the boating community on: - Their responsibilities with respect to the disposal of ballast, sewage and rubbish, - The location of existing sewage pump-out and rubbish disposal facilities, and - How to safeguard against leaks and spills, and what to do if a leak or spill occurs. This should include a distribution of a copy of NSW Maritime's 'Don't Make Waves' brochure.	LGA-wide	All	54,70,79,88,96, 104, 189	NSW Maritime		Council	C08, C15, P02, P46, P47, W05	P41	\$ 25,000	\$ 10,000	\$ 130,940		2	0	3	0	0	0	0	0	0	3	8	2	10
E01	Habitat and Species Conservation	Education	Distribute available NSW Maritime's Brisbane Water Boating Map to ensure waterway users are aware of the regulations relating to navigational safety, permissible activities and their responsibilities as boat users.	Registered Boat Owners	All	48,55,62,146	NSW Maritime		WG	C08, E11, E14, P18, P34, R22, W658		\$ 15,000	\$ 2,500	\$ 41,485		0	0	2	0	0	0	1	0	0	3	6	2	8

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E14	Habitat and Species Conservation	Education	Distribute I&I NSW's Saltwater Fishing Guides, which provide advice about fishing regulations, responsible fishing and safety tips.	Registered Boat Owners and locally-registered Fishing Licence Holders	All	48,55,62,147	I&I NSW	Fishcare Volunteers	Council	C08, E01, E11, P18, P34, R22		\$ 15,000	\$ 2,500	\$ 41,485		0	0	2	0	0	0	1	0	0	3	6	2	8	
P41	Recreational Usage	Planning	Prepare a Brisbane Water Estuary Users Plan which addresses such issues as equity of access, boat storage, conflicts of usage, mooring types and caps, number and type of public access points (wharves and jetties), coverage and consistency of foreshore Plans of Management with priority areas identified for new Plans of Management, estimation of an estuary carrying capacity with respect to development intensity, fishing/fisheries and boating. Reference should be made to the Brisbane Water Estuary Processes Study, particularly Appendix N, for further details on existing recreational patterns, conflicts and future opportunities, as well as details of where recreation may be impacting on other estuarine processes (e.g. on ecological processes). It is noted that implementation of this action is also dependent upon the provision of supporting information via the implementation of other management actions (as indicated).	Estuary Foreshores / Waterway-wide	All	17,19,20,85, 162, 180	GCC		GCC	C12, P55, W81	R31	\$ 60,000	\$ -	\$ 60,000		2	2	5	0	0	2	5	5	0	5	26	2	28	
P43	Foreshore Development	Planning	Prepare a Sea Level Rise Study that will deliver land use zoning and development controls for the Estuary that are based on the current IPCC projections of 0.9m sea level rise by 2100. The preparation of this study should be closely linked to the Brisbane Water Foreshore Flood Plain Risk Management Study & Plan, anticipated to be drafted by 2011.	Estuary Foreshores	All	126,128	GCC	DECCW	GCC	P10, P15, P44, P45, P54, R40		\$ 45,000	\$ -	\$ 45,000		0	3	2	5	4	0	-1	3	0	5	21	2	23	
P53	Commercial Development	Planning	Promote the Brisbane Water Estuary for eco-tourism and support relevant local commercial development in this area.	Estuary Foreshores/ Waterway-wide	All	185, 250	GCC	LPMA, Central Coast Tourism, Gosford Chamber	Community	P54, P55, P54		\$ 300,000	\$ 100,000	\$ 1,359,401		0	0	5	0	4	2	5	5	0	0	21	1	22	
P04	Water and Sediment Quality	Planning	Review and revise DCP 165 - Water Cycle Management to reflect current best practice.	LGA-wide	All		GCC		Cardno	C02, C13, P43, W58		\$ 40,000	\$ -	\$ 40,000		4	2	4	4	0	0	2	1	0	0	17	2	19	
P54	Commercial Development	Planning	Promote the sustainable commercial development of the Estuary and its foreshores in accordance with Council's Corporate Strategy and the principles of Ecologically Sustainable Development.	Catchment-wide/Waterway-wide	All	185	GCC	LPMA	Cardno	P53, P55, P56, P57		\$ -	\$ 55,000	\$ 582,671		-1	-1	4	-1	4	3	4	5	0	0	17	2	19	
P59	Governance	Planning	Adopt the Vision Statement for the Brisbane Water Estuary provided in the Estuary Management Study.	Catchment-wide / Waterway-wide	All	164	GCC		Community	P36, W114		\$ -	\$ 2,000	\$ 21,188		0	0	3	0	1	1	1	1	5	5	17	1	18	
P01	Water and Sediment Quality	Planning	Provide for the development, implementation and regular re-assessment of Riparian Zone and Bank Management Plans for the major tributaries draining into the Estuary, including Narara Creek, Erina Creek, Kincumber Creek (Riparian Plan already in place), Woy Woy Creek and Ettalong Creek.	Catchment-wide	All	122, 195	GCC	DWE	Community, Cardno	P13, W34, W53		\$ 250,000	\$ 125,000	\$ 1,574,252		4	3	4	1	0	2	0	0	0	0	14	2	16	
P07	Sedimentary Processes	Planning	Develop formal standard designs for key navigational channels in Brisbane Water that identify the desired channel profile and likely maintenance dredging requirements to maintain these configurations for the purposes of recreational and commercial boating. The purpose of this action is to provide clear information to users of Brisbane Water and manage community expectations in relation to maintenance of navigation channels, while acknowledging natural rates of sediment transport in these locations and likely environmental impacts. This process should be informed by the Sediment Management Plan provided in the Estuary Management Study and the findings of the Estuary Processes Study. It is acknowledged that additional investigations may be required to develop the standard designs.	Waterway-wide	All	8, 9, 16, 27, 29, 32, 38, 40, 42, 45, 46, 47, 60, 72, 80, 85, 106, 129, 130, 233	LPMA	GCC, NSW Maritime	CEMC - MA	R09, W18-W20, W25		\$ 100,000	\$ 4,000	\$ 142,376		0	4	3	0	0	0	4	1	2	2	2	16	0	16
P45	Foreshore Development	Planning	Undertake a review of the existing foreshore development policies and plans for the Gosford LGA and assess the need to amend development controls to provide for controlled, sustainable development of the foreshore.	LGA-wide	All	133, 184, 119	GCC		Cardno, Community	P08, P09, P10, P30, P54, W82	P43	\$ 60,000	\$ -	\$ 60,000		1	4	3	4	1	3	0	-2	0	0	14	1	15	
P49	Foreshore Development	Planning	Develop guidelines (or compile existing guidelines where available) for foreshore stabilisation via the establishment of locally native estuarine plant species. The guidelines should provide details of the benefits of soft stabilisation works, advice on the species to be used and how to establish plantings. Seedlings may be cultivated at Council's nursery for supply to interested parties.	LGA-wide	All		GCC	CMA, DECCW	Community	W34, W41, W45, W48, W49, W104		\$ 30,000	\$ 50,000	\$ 559,701		2	5	4	2	0	0	0	0	0	2	15	0	15	
P60	Information, Communications and Education	Planning	Ensure that climate change considerations are incorporated into all relevant Plans of Management for locations around the Estuary.	LGA-wide	All		GCC	DECCW, CMA	Community	E8, W60, R40	P43	\$ 55,000	\$ -	\$ 55,000		0	0	2	4	4	0	0	0	0	3	13	2	15	
P28	Habitat and Species Conservation	Planning	Provide adequate resources within Council to provide for ongoing management of Bushcare volunteers.	LGA-wide	All	249	GCC		GCC	W71, W73, W76, W78		\$ -	\$ 80,000	\$ 847,521		1	1	5	0	0	1	1	0	0	3	12	2	14	
P50	Foreshore Development	Planning	Review D6.47 - Setback Policy: Creeks, Rivers and Lagoons. The review should in the first instance widen the definition of applicable waterbodies to incorporate 'estuaries', and in the second instance be re-assessed to incorporate the likely impacts of climate change. In particular, the setbacks applied should be re-assessed to take into account processes relating to both catchment flooding and foreshore inundation.	LGA-wide	All	49,126	GCC		Cardno	P44	P43, R40	\$ 15,000	\$ -	\$ 15,000		0	4	3	5	0	0	0	0	0	0	12	2	14	
P14	Sedimentary Processes	Planning	Continue to enforce prohibition of mowing to the waters edge in both public and private foreshore areas in order to minimise foreshore erosion and impacts on estuarine vegetation.	Green Point	2	198	GCC		GCC	E09, R22		\$ -	\$ 15,000	\$ 158,910		2	3	2	1	0	2	0	0	0	1	11	2	13	
P09	Sedimentary Processes	Planning	Implement tighter erosion and sedimentation controls to minimize risks to seagrass, with a priority for catchments adjacent to areas of seagrass of high value for species.	Catchment-wide	All	28,55,91,144	GCC	I&I NSW	WG	C13, P18, P20, R20, W35		\$ -	\$ 25,000	\$ 264,850		2	3	4	0	0	0	0	0	0	0	9	2	11	
P16	Habitat and Species Conservation	Planning	Investigate opportunities to purchase saltmarsh areas for incorporation into Council's reserve system in accordance with policy R0.15 - Acquisition of Wetlands.	Estuary Foreshores	All	51	GCC	LPMA	WG	R19		\$ -	\$ 500,000	\$ 5,297,007		1	1	4	2	0	0	1	0	0	0	9	2	11	

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P20	Habitat and Species Conservation	Planning	Develop a conservation and education strategy for seagrass beds, as identified in the Estuary Processes Study, that: - support the highest abundance and diversity of fish, - are known to be important for sponges and ascidians, and - are known to be important for biological connectivity.	Estuary-wide	All	55,91,100,101, 111	I&I NSW	GCC, University of Newcastle, Fishcare Volunteers	WG, CEMC - MA	E01, P18, R20, W65		\$ 35,000	\$ 10,000	\$ 140,940		1	0	5	0	0	0	1	0	0	3	10	1	11	
P48	Foreshore Development	Planning	Develop environmentally friendly design and construction guidelines for foreshore infrastructure such as jetties, boat ramps, seawalls/retaining walls and foreshore protection works. This should include advice on retro-fitting existing structures to be more environmentally friendly. The guidelines should be made publicly available and distributed to all foreshore property owners. (Note: Seawalls addressed in DECCW's Environmentally Friendly Seawalls Guidelines).	LGA-wide	All	118,133	GCC	NSW Maritime, DECCW, I&I NSW	Cardno, community.	R11, W29, W38		\$ 30,000	\$ 6,000	\$ 93,564		2	3	3	0	0	0	0	0	0	2	10	1	11	
P02	Water and Sediment Quality	Planning	Develop and implement a pollution response strategy to address major pollution events. Policy D1.02 - Oil Spillages in Navigable Waters should be updated accordingly.	Waterway-wide	All		GCC	DECCW, NSW Maritime	WG	C01, E11		\$ 25,000	\$ -	\$ 25,000	National Natural Disaster Mitigation	2	0	5	0	0	0	2	0	0	0	9	1	10	
P31	Cultural Heritage	Planning	Provide ongoing protection for sites of Indigenous and non-Indigenous heritage significance for the local community.	LGA-wide	All		DECCW, DoP	GCC	Community		WP28, W34	\$ -	\$ 45,000	\$ 476,731		0	0	0	2	5	1	0	0	0	0	8	2	10	
P27	Habitat and Species Conservation	Planning	Develop a Plan of Management to provide protection for the Bush Stone Curlew populations occurring around the estuary. In addition, provide for ongoing implementation of the Plan of Management for Green and Golden Bell Frogs.	LGA-wide	All	51, 232	GCC	DECCW, University of Newcastle	GCC	E03, P23		\$ 55,000	\$ -	\$ 55,000	Australian Bird Environment Foundation Grant	1	0	5	0	0	0	0	0	0	1	7	2	9	
P19	Habitat and Species Conservation	Planning	Develop a strategy for the conservation of areas important for the biodiversity of invertebrates. Particular attention should be paid to priority sites that represent the greatest proportion of species, including Ettalong, Narara Creek, Koolewong, and Woy Woy Bay-Pelican Island.	Ettalong, Narara Creek, Koolewong, and Woy Woy Bay-Pelican Island	All	90, 142, 143, 151	GCC	I&I NSW, DECCW, University of Newcastle	WG			\$ 50,000	\$ 22,000	\$ 283,068		1	0	5	0	0	0	-2	0	0	3	7	1	8	
P23	Habitat and Species Conservation	Planning	Develop a conservation strategy for the birds of Brisbane Water Estuary that addresses the main issues of disturbance by pedestrians, dog-walkers and watercraft, predation by feral and domestic animals, and habitat loss/degradation. This should include consideration of threatened and protected species such as the Bush Stone Curlew.	Waterway-wide/Catchment-wide	All	51, 160, 161	GCC	CMA, DECCW, local bird watching clubs	WG	E03, P27		\$ 30,000	\$ 10,000	\$ 135,940	Australian Bird Environment Foundation Grant	0	0	5	0	0	0	1	0	0	0	6	2	8	
P44	Foreshore Development	Planning	Develop a guiding policy regarding the water boundary determination for foreshore properties consistent with Clause 55N of the Coastal Protection Act 1979.	Estuary Foreshores	All		LPMA	GCC	Cardno		R40	\$ 20,000	\$ -	\$ 20,000		1	4	0	4	0	0	-1	-2	0	0	6	2	8	
P47	Foreshore Development	Planning	Enforce jetty sharing arrangements via the leasing mechanism such that each jetty services 2-3 properties. This will involve review of applications for new leases as well as license/lease renewals.	Waterway-wide	All	114, 133	LPMA		Cardno	P33, P46		\$ 25,000	\$ -	\$ 25,000		2	1	1	0	1	2	-1	0	0	0	6	2	8	
P13	Sedimentary Processes	Planning	Geomorphological assessment required to develop options to address the bank erosion occurring upstream of Ann Close Reserve on Narara Creek.	Narara	1	195	GCC		GCC		P01, W34	\$ 45,000	\$ -	\$ 45,000		1	1	1	0	0	1	1	0	0	0	5	2	7	
P46	Foreshore Development	Planning	Review existing DCP 119 - Wharves and Jetties with a view to ensuring the policy is in accordance with the goals and objectives of the Estuary Management Study and Plan. In addition, sea level rise projections should also be considered where facilities are to be upgraded.	LGA-wide	All	128	GCC	LPMA	Cardno	P45	P43, R40	\$ 12,500	\$ -	\$ 12,500		0	2	2	0	0	1	0	0	0	0	5	2	7	
P30	Habitat and Species Conservation	Planning	Develop a DCP for Wetlands aimed at maintaining and restoring natural biological and physical processes of wetland function by minimising changes to wetland hydrology from land uses in the catchment. This should be undertaken in line with NSW Wetland Management Policy 2010.	LGA-wide	All	110	GCC		GCC	C13, P04		\$ 40,000	\$ -	\$ 40,000		2	1	2	0	0	1	0	-1	0	0	5	1	6	
P33	Recreational Usage	Planning	Provide linkages between different portions of publicly accessible foreshores by linking with other foot or cycle paths and public transport linkages in line with Councils Cycleway Strategy.	Catchment-wide	All	165, 167	GCC		Community		W41, W82, W84, W94, W104, W110	\$ 20,000	\$ -	\$ 20,000		0	0	0	0	0	0	4	0	0	0	4	2	6	
P05	Water and Sediment Quality	Planning	Investigate the need for sediment traps and other stormwater management measures to control any erosion and sedimentation from sloping lands draining to the stormwater outlet opposite Byalla Lane.	Saratoga	2	238	GCC		GCC		R24, W01	\$ 17,500	\$ -	\$ 17,500		1	1	1	0	0	0	1	0	0	0	4	1	5	
P39	Recreational Usage	Planning	Assess options for relocation of the Pretty Beach pool such that it will be suitable for swimming under all tidal conditions and is not subject to sediment build-up.	Pretty Beach	6	102, 168	GCC		CEMC - GSm		W30-32	\$ 55,000	\$ -	\$ 55,000		1	1	0	1	0	0	1	0	0	0	4	1	5	
P08	Sedimentary Processes	Planning	Review and revise DCP 145 Boating Facilities in St Hubert's Island Canals to ensure consistency with the goals objectives of the Management Study and Plan. In particular, explicit consideration of sedimentary processes should form part of the assessment process for all development applications.	St Hubert's Island	4	29, 32	GCC		Cardno		W19, W35	\$ 15,000	\$ -	\$ 15,000		0	1	2	0	0	0	-1	0	0	0	2	2	4	
P40	Recreational Usage	Planning	Consider the need to develop a Wrack Management Policy that clearly identifies: - the regulatory requirements that must be addressed in order to remove seagrass wrack from foreshore areas, - the manner in which this should be undertaken, and - suitable secondary uses for wrack.	Estuary Foreshores	All		GCC		Community				\$ 7,500	\$ -	\$ 7,500		0	0	3	0	0	0	0	0	0	0	3	0	3
P55	Commercial Development	Planning	Investigate options for constructing new (and/or expanding existing) boating facilities.	Waterway-wide	All	65,70	LPMA, Private Developers	GCC	CEMC - GSm, Community		P54	\$ 100,000	\$ -	\$ 100,000		-2	-2	-1	0	0	-1	4	4	0	0	2	0	2	
P03	Water and Sediment Quality	Planning	Support State government proposal to prohibit 2 stroke outboard motors.	Waterway-wide	All	163	NSW Maritime	GCC	WG			\$ -	\$ 5,000	\$ 52,970		2	0	2	0	0	0	-5	0	0	0	-1	0	-1	
R37	Governance	Research/ Monitoring	Design a comprehensive Estuary Monitoring Plan to include elements of the physical, social and biological environment to evaluate the success in meeting the objectives and goals outlined in the Estuary Management Plan. The Monitoring Plan should draw together all those individual monitoring activities listed in the actions list into a single overarching framework in line with the NSW Monitoring, Evaluation and Reporting Framework.	Catchment-wide/Waterway-wide	All	92	GCC		Cardno	R36, R40, R41	R01, R05, R22, R25	\$ 25,000	\$ 55,000	\$ 607,671		4	4	4	3	2	1	1	0	5	5	29	2	31	
R36	Governance	Research/ Monitoring	Establish an annual reporting mechanism to communicate progress towards achieving the goals and objectives of the Management Plan and Estuary Monitoring Plan. The annual report should consider the need for adaptive management as required.	Catchment-wide/Waterway-wide	All	252	GCC		Cardno	R40, R41	R37	\$ -	\$ 15,000	\$ 158,910		3	3	3	3	2	1	1	0	5	5	26	1	27	
R38	Governance	Research/ Monitoring	Research possible sources of funding and secure ongoing funding for implementation of the Plan. It is anticipated that responsibility and funding for these studies/plans may be shared across State, Federal and local government agencies.	Catchment-wide/Waterway-wide	All	89, 252	GCC		CEMS - GSm, GCC		R38	Currently underway	\$ -	N/A		2	3	3	3	3	1	1	0	5	0	21	1	22	

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R24	Habitat and Species Conservation	Research/ Monitoring	Investigate the use of constructed wetlands, sediment, and detention basins and other WSUD options to minimise the effect of freshwater and sediment inflows, with particular reference to areas of high biodiversity value around entrances to creeks. Consideration should be given to both current and future meteorological conditions.	Catchment-wide	All		GCC	CMA	WG	W01		Refer to linked option.	\$ -	N/A		3	4	3	5	0	0	2	0	0	0	17	1	18
R26	Habitat and Species Conservation	Research/ Monitoring	Develop a research partnership with universities to continue the scientific focus on Brisbane Water Estuary and support this with annual research grants.	LGA-wide	All		GCC	Universities	WG	E03, P19, P20, P27		\$ 30,000	\$ 40,000	\$ 453,761	Australian Research Council Grants	2	2	3	1	1	0	0	2	1	5	17	1	18
R39	Information, Communications and Education	Research/ Monitoring	Develop and maintain a database of all environmental and ecological data available for the Brisbane Water Estuary with a view to providing a comparison between present and historic Estuary conditions. This database should be regularly updated with the results of any monitoring undertaken. Long term trends should be identified and this information communicated directly to the public on a regular basis.	Catchment/Waterway-wide	All		GCC	CMA, DECCW	CEMS - GSm	R38, R04		\$ 20,000	\$ 12,500	\$ 152,425		3	3	3	3	0	0	0	0	0	4	16	1	17
R40	Information, Communications and Education	Research/ Monitoring	Provide for ongoing monitoring of estuarine water levels to provide a continuous long term data set. This is key for monitoring for the potential impacts of climate change and initiating appropriate adaptive management responses. The need to install additional water level gauges should be considered.	Waterway-wide	All	128	DECCW		Council	E08, P16, P31, P43, P46, P50, P60, R41		Currently being funded by DECCW.	\$ -	N/A		0	0	1	2	1	0	0	0	3	5	12	3	15
R31	Recreational Usage	Research/ Monitoring	Conduct an audit of existing land-based and water-based infrastructure for boating (e.g. picnic tables, playgrounds, BBQs, jetties, boat ramps, dinghy storage areas, moorings, trailer parking areas, etc.) focusing on: - Patterns in patronage/usage, - Condition and maintenance requirements, - Characterisation of neighbouring land uses, - Proximity to key habitat, heritage items and other environmentally sensitive areas, - Proximity to key locations (e.g. pump out stations, marinas, popular fishing spots, etc.), and - Safety. Based on the outcome of the audit, assess the need to upgrade, maintain or de-commission existing infrastructure. The purpose of this audit is primarily to rationalise recreational access and amenity. The findings may be used to inform Option P41, the Users Plan.	Estuary Foreshores/ Waterway-wide	All	3,28,52,61,65, 81, 82,93,95,97, 166, 169, 170, 172, 179, 181, 182	GCC	LPMA, NSW Maritime	Cardno	P34-P36, P41, P47, P55, W69, W77, W81, W93, W94-W96	P41, P43	\$ 120,000	\$ -	\$ 120,000		1	1		1	1	1	5	2	0	0	12	2	14
R01	Water and Sediment Quality	Research/ Monitoring	Conduct a review of the design and methodology employed in the existing water quality monitoring program. Ideally the program should be a comprehensive, scientifically rigorous and ongoing program of water and sediment quality monitoring for the Brisbane Water Estuary, incorporating dry weather and event monitoring of both the tributary mouths and main waterbody. Sampling in the main waterbodies should incorporate vertical profiling.	Catchment/Waterway-wide	All		GCC	CMA	Cardno	R37, R38, R40		\$ 35,000	\$ -	\$ 35,000		4	0	3	0	0	0	3	0	0	1	11	2	13
R10	Sedimentary Processes	Research/ Monitoring	Conduct a condition assessment of existing stormwater outlets draining into the Estuary focusing on assessing impacts on natural sedimentary processes (e.g. erosion, accretion) and adjacent habitats.	All foreshore areas	All	57,58,135	GCC		Cardno	W27, W51, W62-W64		\$ 80,000	\$ -	\$ 80,000		3	3	3	3	0	0	0	0	0	0	12	1	13
R11	Sedimentary Processes	Research/ Monitoring	Assess options for shoreline protection works that will seek to address the long-term erosion issues at Ettalong Beach.	Ettalong Beach	6	247	GCC	LPMA	CEMC - GSm	P43, W28, W29		\$ 80,000	\$ -	\$ 80,000	NSW Coastal Management Program	0	3	2	2	1	0	3	1	0	0	12	1	13
R04	Water and Sediment Quality	Research/ Monitoring	Audit the performance of existing stormwater quality improvement devices and assess the need for modifications.	Catchment-wide	All	64,67,73,77, 83,105,108, 111,117,127, 130,131,137,	GCC		Cardno	R05, R24, W01		\$ 32,000	\$ -	\$ 32,000		3	3	4	0	0	0	0	0	0	0	10	2	12
R22	Habitat and Species Conservation	Research/ Monitoring	Monitor the extent of riparian, foreshore and aquatic vegetation around the Brisbane Water Estuary. Trends in vegetation condition and extent should be reported every five years. Reference should be made to the NSW Government's Estuarine Monitoring Evaluation Reporting program to assess extent of mangrove, saltmarsh and seagrass (the latter to species).	Waterway-wide/Catchment-wide	All	71, 122, 142, 143, 151	I&I NSW	CMA, DECCW	Cardno	R19, R20, R36, R37, R40		\$ 12,500	\$ 12,000	\$ 139,628		0	1	4	1	0	1	0	0	0	3	10	2	12
R09	Sedimentary Processes	Research/ Monitoring	Conduct ongoing monitoring (by survey) of key navigation channels, including: - Entrance Channel, - Paddy's Channel, - Linter Channel, - Woy Woy Channel, - Wagstaff Channel, - Cockle Channel, and - Saratoga Channel.	Waterway-wide	All	123,124,129	NSW Maritime		CEMC - GS	P07, W18-W25		\$ -	\$ 7,500	\$ 79,455		0	3	0	0	-1	0	4	3	0	0	9	2	11
R03	Water and Sediment Quality	Research/ Monitoring	Calculate a nutrient budget for the Estuary to assess the potential for eutrophication of the more enclosed portions of the waterway. The analysis should assess current conditions and conditions under climate change scenarios. Reference should be made to the water quality modelling undertaken for the Estuary as a whole, as outlined in Appendix E of the Brisbane Water Estuary Processes Study.	Waterway-wide	All		DECCW	GCC	Cardno	W11, W12, W24	R03	\$ 20,000	\$ -	\$ 20,000		4	0	4	0	0	0	1	0	0	0	9	1	10
R18	Habitat and Species Conservation	Research/ Monitoring	Conduct a survey of recreational fishing catches and analyse recreational fishing trends to characterise both the impact on the fish populations of Brisbane Water Estuary and the value of recreational fishing as a local industry.	Waterway-wide	All	99, 100	I&I NSW	University of Newcastle, Fishcare Volunteers	Cardno	R18		\$ 55,000	\$ -	\$ 55,000	Recreational Fishing Trust	0	0	2	0	0	0	3	4	0	0	9	1	10
R27	Cultural Heritage	Research/ Monitoring	Identify the likely location and condition of ship wrecks near the old bar via a maritime archaeological survey.	Entrance	6	192	DoP	LPMA	Cardno	W18		\$ 80,000	\$ -	\$ 80,000		0	2	0	0	5	0	1	0	0	0	8	2	10
R28	Cultural Heritage	Research/ Monitoring	Assess the potential impacts of climate change on heritage items located around the Estuary and along its foreshores.	Waterway-wide/Catchment-wide	All		DoP	GCC, DECCW, DLALC	Cardno	R28	P43	\$ 50,000	\$ -	\$ 50,000	NSW DoP Heritage Grant	0	0	0	3	5	1	0	0	0	0	9	1	10
R41	Information, Communications and Education	Research/ Monitoring	Develop a policy or guideline document detailing specific trigger levels for implementing an adaptive management response to observed climate change impacts on key estuary processes. The trigger levels should be based on observations arising from the Estuary Monitoring Plan (R37) and should (where possible) be explicitly defined. A corresponding adaptive management response should be developed for each trigger. The policy should be reviewed as climate change projections are updated or as additional data/information becomes available.	Waterway-wide	All	128	GCC	DECCW, I&I NSW	Council		R38, R40	\$ 50,000	\$ 2,000	\$ 71,188		0	0	1	1	1	0	0	0	2	2	7	3	10
R42	Sedimentary Processes	Research/ Monitoring	Undertake an estuarine shoreline vulnerability assessment (based on shoreline geomorphology) to assist in planning for sea level rise.	Waterway-wide	All		GCC	DECCW	Council			\$ 40,000	\$ -	\$ 40,000		0	3	1	0	0	0	0	0	0	3	7	3	10

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R14	Sedimentary Processes	Research/Monitoring	Investigate options for replacing or modifying the existing seawall along Dane and Mason Parades with an environmentally friendly seawall. The options should aim to dissipate incoming waves and address erosion occurring at this location.	Gosford	2	11,18,136, 200, 201	GCC		GCC	P48, W69		\$ 60,000	\$ -	\$ 60,000	NSW Coastal Management Program	1	2	2	1	0	1	1	0	0	0	8	1	9
R05	Water and Sediment Quality	Research/Monitoring	Keep a log of the volumes and types of material removed from GPTs during routine maintenance and incorporate this information into the water quality monitoring program.	Catchment-wide	All		GCC		Cardno	R06, R04		\$ -	\$ 6,000	\$ 63,564		3	0	3	0	0	0	0	0	0	0	6	2	8
R19	Habitat and Species Conservation	Research/Monitoring	Investigate options for the landward migration of intertidal habitats such as saltmarsh under climate change scenarios.	Estuary Foreshores	All		GCC	CMA, DECCW	WG, GCC	E8, W60	P43, R19, R40	\$ 60,000	\$ -	\$ 60,000		0	2	3	3	0	0	-2	0	0	0	6	2	8
R20	Habitat and Species Conservation	Research/Monitoring	Investigate opportunities to monitor indicator organisms within the estuary to assess effectiveness of management measures to protect biodiversity and maintain the ecological health of the Estuary.	Waterway-wide/Catchment-wide	All	103,142, 145, 151	I&I NSW, GCC	CMA, DECCW	WG	R36, R37		\$ 20,000	\$ 85,000	\$ 920,491		0	0	4	0	0	0	0	0	0	3	7	1	8
R29	Cultural Heritage	Research/Monitoring	Recognise the historic Aboriginal ownership and use of the area by undertaking research into local languages, customs and significant sites.	LGA-wide	All		GCC	DECCW, DLALC	Community	P31		\$ 100,000	\$ -	\$ 100,000	DEWHA Indigenous Heritage Program	0	0	0	0	5	0	0	0	0	0	5	2	7
R25	Habitat and Species Conservation	Research/Monitoring	Manage Caulerpa taxifolia in accordance with the 'NSW Control Plan for the Noxious Marine Alga Caulerpa taxifolia' (Industry & Investment NSW, 2009).	Waterway-wide	All		I&I NSW		WG			\$ 50,000	\$ 22,000	\$ 283,068	Recreational Fishing Trust	0	0	2	0	0	0	0	0	0	2	4	2	6
R15	Sedimentary Processes	Research/Monitoring	Investigate options for addressing/managing subsidence currently occurring near Erina Creek.	Muloora Rd, Springfield	2	207	GCC		GCC	W34		\$ 55,000	\$ -	\$ 55,000		1	1	0	0	0	0	1	0	0	0	3	2	5
R16	Sedimentary Processes	Research/Monitoring	Identify the cause of erosion under the bridge near Lara Street and outline measures to address this issue.	Park Bay	3	213	GCC		GCC	W34		\$ 35,000	\$ -	\$ 35,000		1	1	1	0	0	0	0	0	0	0	3	2	5
R17	Sedimentary Processes	Research/Monitoring	Investigate options for implementation to address the erosion along Hardy's Bay Parade.	Killcare	6	244	GCC		GCC	W34		\$ 220,000	\$ 7,500	\$ 299,455		1	1	1	0	0	0	0	0	0	0	3	2	5
R35	Recreational Usage	Research/Monitoring	Investigate options for improving public access over the rail line to the foreshore adjacent to Railway Street.	Woy Woy	3	212	GCC	RailCorp	GCC			\$ 50,000	\$ -	\$ 50,000		0	0	-1	0	0	-1	1	0	0	0	-1	2	1
W01	Water and Sediment Quality	Works	Investigate options for implementing catchment based WSUD features in the catchment in order to manage stormwater quality and quantity, with a priority focus on the Narara and Erina Creek catchments, followed by Kincumber Creek catchment.	Catchment-wide	All	117	GCC		Cardno, CEMC MA, Community	P05, R04-R06, R24, W04, W06, W07, W10, W13, W14		\$ 60,000	\$ 65,000	\$ 748,611		5	4	5	0	0	1	2	1	0	0	18	2	20
W34	Sedimentary Processes	Works	Identify locations of bank erosion along creeklane corridors and the Estuary foreshore. Design and implement remediation measures to address these issues, with re-establishment of native vegetation being the preferred option where feasible. Reference should be made to the shoreline assessment provided in Appendix H of the Brisbane Water Estuary Processes Study.	Erina Creek, Narara Creek, Woy Woy Creek, Hardy's Bay and Kincumber Creek as a priority	All	23, 121, 234,	GCC	DWE, DECCW	CEMC - MA	P13, P14, R10, R17, W38, W41, W45, W46, W48, W49, W53, W55		\$ 200,000	\$ 175,000	\$ 2,053,952		3	4	4	1	1	1	2	0	0	0	16	2	18
W29	Sedimentary Processes	Works	Investigate options to improve existing shoreline protection works which incorporate environmentally friendly design features.	Ettalong Beach	6	78	GCC	DECCW, LPMA	Community	P12, W28, W55, W112	R11	\$ 1,200,000	\$ 15,000	\$ 1,358,910	NSW Coastal Management Program	0	3	2	2	1	3	3	1	0	0	15	1	16
W26	Sedimentary Processes	Works	Rehabilitate the eroding foreshores on the eastern shores of Hardy's Bay with natural vegetation typical of that naturally occurring in the area. Where this is not feasible, investigate environmentally friendly seawall options.	Eastern shores of Hardy's Bay	6	246	GCC	Volunteers	CEMC - GS	E09, P49		\$ 20,000	\$ -	\$ 20,000		2	4	3	2	0	2	0	0	0	0	13	1	14
W71	Habitat and Species Conservation	Works	Where appropriate, rehabilitate saltmarsh habitats, with saltmarshes at Saratoga, Empire Bay, Davistown and Riley's Island addressed as a priority.	Saratoga, Empire Bay, Davistown and Riley's Island	All	34,218,149	GCC	DECCW, CMA, Bushcare Volunteers	WG	W69, W70		\$ 60,000	\$ 15,000	\$ 218,910	Caring for Our Country Grant	2	3	5	1	0	1	0	0	0	0	12	1	13
W84	Recreational Usage	Works	Provide boardwalks at sensitive foreshore locations to permit public access.	Estuary Foreshores	All	165	GCC		Community	P50, P51, W94	W81	\$ 20,000	\$ 100,000	\$ 1,079,401		2	1	2	1	1	2	3	0	0	0	12	1	13
W02	Water and Sediment Quality	Works	Install additional sewage pump-out facilities to reduce water pollution. These should be situated at locations accessible by a range of vessels.	Waterway-wide	All	70	NSW Maritime		WG	E11, P55, W81		\$ 100,000	\$ 50,000	\$ 629,701	NSW Maritime Better Boating Program (up to 50%)	4	0	3	0	0	0	4	0	0	0	11	1	12
W18	Sedimentary Processes	Works	Periodically dredge the navigation channel up to 50,000m3 in the Estuary entrance to ensure safe navigation.	Entrance	6	21,38,80, 106	LPMA	GCC	CEMC - GS	R08, R09, W28		\$ 850,000	\$ 150,000	\$ 2,439,102		-1	4	0	0	-1	0	4	3	0	0	9	2	11
W28	Sedimentary Processes	Works	Undertake beach re-nourishment works at Ettalong Beach for the purposes of beach amenity and foreshore protection.	Ettalong Beach	6	78	GCC	LPMA	Cardno, CEMC GS	P12, W29, W55, W112	R11	\$ 50,000	\$ 125,000	\$ 1,374,252		-1	4	0	0	-1	0	4	3	0	0	9	2	11
W83	Recreational Usage	Works	Identify priority, privately owned/managed parcels of foreshore land for acquisition and/or incorporation into publicly accessible foreshore land.	Estuary Foreshores	All	165	GCC	LPMA	Cardno, Community	P50, P51, W94	W81	\$ -	\$ 550,000	\$ 5,826,708		0	1	2	1	1	2	3	0	0	0	10	1	11
W27	Sedimentary Processes	Works	Undertake regular maintenance to remove sediments from the outlets of stormwater drains.	Catchment-wide	All	74, 191	GCC		CEMC - GS	R10, W01		\$ -	\$ 50,000	\$ 529,701		2	3	2	3	0	0	0	0	0	0	10	0	10
W33	Sedimentary Processes	Works	Reinstate a vegetated, sandy shoreline at Pretty Beach similar to that present prior to the construction of Pretty Beach Road. The use of mangroves for revegetation works is discouraged due to their potential to outcompete and displace saltmarsh.	Pretty Beach	6		GCC	Volunteers	CEMC - GS, Community	P49, W31, W32		\$ 225,000	\$ 6,000	\$ 288,564		1	2	2	0	0	2	1	0	0	0	8	2	10
W69	Habitat and Species Conservation	Works	Review condition of existing sea walls in Council's foreshore parks to investigate possibility of returning natural foreshore and/or use of alternative materials in line with DECCW's Environmentally Friendly Seawalls guidelines.	Estuary Foreshores	All		GCC	LPMA, DECCW, CMA	WG	R15, W43, W47, W54	W56, W41, R48	\$ 50,000	\$ 50,000	\$ 579,701		1	3	5	-1	-1	1	0	0	0	0	8	2	10
W76	Habitat and Species Conservation	Works	Rehabilitate the saltmarshes in Yattalunga Bay, to include the strategic removal of mangroves, weeding and control of nutrient inputs.	Yattalunga Bay	2		GCC	Volunteers	Community	R20, W01, W73		\$ 55,000	\$ 12,000	\$ 182,128	Caring for Our Country Grant	2	1	4	1	0	1	0	0	0	0	9	1	10
W91	Recreational Usage	Works	Provide bins and bags for the disposal of animal faeces by dog walkers.	Catchment-wide	All		GCC		Community	C10, W89		\$ 15,000	\$ 10,000	\$ 120,940		3	0	1	0	0	1	3	0	0	0	8	2	10
W12	Water and Sediment Quality	Works	Provide for ongoing maintenance of the opening(s) under the Brisbane Water Drive causeway to prevent siltation and maintain flushing (for water quality purposes).	Woy Woy	3	112, 125,139, 157	LPMA	GCC	Community	W11		\$ -	\$ 12,500	\$ 132,425		2	1	2	1	0	0	1	0	0	0	7	2	9
W35	Sedimentary Processes	Works	Design and construct appropriate sediment control works to address sediment accretion issues at St Hubert's Island.	St Hubert's Island	4	22,29,32	GCC		CEMC - MA	P08, W19		\$ 400,000	\$ 15,000	\$ 558,910		2	2	3	0	0	0	0	0	0	0	7	2	9
W70	Habitat and Species Conservation	Works	Fence existing saltmarshes to prevent access by vehicles, bikes and domestic animals.	Estuary Foreshores	All	34,41,155	GCC	CMA, Bushcare Volunteers	WG, GCC	W71		\$ 250,000	\$ 15,000	\$ 408,910	Caring for Our Country Grant	1	3	4	1	0	-1	-1	0	0	1	8	1	9
W123	Habitat and Species Conservation	Works	Investigate the feasibility of utilising artificial reef structures to provide habitat diversity and/or minimise foreshore erosion/recession. Note: This option may provide a research opportunity if implemented.	Waterway-wide	All		GCC	I&I NSW, DECCW	Council	R26		\$ 75,000	\$ -	\$ 75,000		-1	2	3	0	0	0	2	0	0	0	6	2	8
W39	Sedimentary Processes	Works	Rehabilitate eroded foreshore near 29 Araluen Drive, Killcare.	Killcare	6		GCC		Community		W34	\$ 80,000	\$ -	\$ 80,000		1	1	2	1	0	0	1	0	0	0	6	2	8
W93	Recreational Usage	Works	Provide additional rubbish and recycling bins along the foreshore, focusing on access points and targeting heavily utilised foreshore reserves as a priority.	Estuary Foreshores	All	54	GCC		Community		R31	\$ 25,000	\$ 15,000	\$ 183,910		2	0	2	0	0	0	3	0	0	0	7	1	8

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W04	Water and Sediment Quality	Works	Provide additional sediment traps for locations draining to Correa Bay. Sediment traps should target catchment inflows from the Bulls Hill Quarry and Garbage tip.	Correa Bay	3	30,31,141	GCC		Community	W01, W22		\$ 100,000	\$ 7,500	\$ 179,455		2	1	2	0	0	0	1	0	0	0	0	6	1	7	
W05	Water and Sediment Quality	Works	Advertise and provide signage for boat pump-out facilities.	Gosford, Hardy's Bay	2, 6	88	NSW Maritime		Community	E11, P55, W02, W81		\$ 17,500	\$ 5,000	\$ 70,470		3	0	2	0	0	0	2	0	0	0	0	7	0	7	
W06	Water and Sediment Quality	Works	Install and maintain as required sediment traps targeting stormwater flows draining from the escarpment at Hardy's Bay.	Hardy's Bay	6	191	GCC		Community	W01		\$ 100,000	\$ 6,000	\$ 163,564		2	1	2	0	0	0	1	0	0	0	0	6	1	7	
W07	Water and Sediment Quality	Works	Provide ongoing maintenance of existing sediment traps in locations draining to Horsfield Bay.	Horsfield Bay	3	27,30,31	GCC		Community	W01		\$ -	\$ 6,000	\$ 63,564		2	1	2	0	0	0	1	0	0	0	0	6	1	7	
W37	Sedimentary Processes	Works	Remove disused pipes, posts, debris and other rubbish from the intertidal portion of the mudflats adjacent to Victory Pde, Tascott, where they are posing a risk to navigation.	Tascott	2	4,13, 191	GCC		Community			\$ 55,000	\$ -	\$ 55,000		1	1	2	0	0	1	0	0	0	0	0	5	2	7	
W65	Habitat and Species Conservation	Works	Replace existing swing moorings within the Estuary with more appropriate, seagrass friendly moorings.	Waterway-wide	All	55,62,95,116, 144,147	NSW Maritime		Cardno, WG, CEMC -	R31		\$ -	\$ 7,500	\$ 79,455		0	3	2	0	0	0	0	0	0	0	0	5	2	7	
W73	Habitat and Species Conservation	Works	Continue weed control activities in Council's foreshore reserves.	Estuary Foreshores	All	49, 156, 208	GCC	Bushcare Volunteers	Cardno			\$ -	\$ 7,500	\$ 79,455		0	0	5	0	0	0	0	0	0	0	0	5	2	7	
W77	Habitat and Species Conservation	Works	Provide alternative dinghy storage arrangements and fence the Endangered Ecological Community (EEC) at Mason Pde, Gosford. Ensure ongoing enforcement of prohibition of dinghy storage impacting on the EEC adjacent to the Scout Hall in this location.	Mason Pde, Gosford	2	206	GCC		GCC	C07, P35		\$ 80,000	\$ 5,000	\$ 132,970		1	1	2	0	0	0	1	0	0	0	0	5	2	7	
W104	Recreational Usage	Works	Improve public access along the foreshore reserve between Ironbark Point and Rocky Point. Assess the feasibility of installing a boardwalk, undertaking foreshore stabilisation works and/or creating a public path in front of houses between 36-40 Asca Drive.	Green Point	2	2, 196	GCC		GCC	W82		\$ 175,000	\$ 10,000	\$ 280,940		0	1	1	0	0	1	1	0	0	0	0	4	2	6	
W11	Water and Sediment Quality	Works	Install an additional opening/culvert under the Brisbane Water Drive causeway with a view to increasing flushing of Woy Woy Inlet and Woy Woy Bay, thereby improving water quality and promoting natural scouring of sediments. This option will require detailed investigations to confirm the feasibility and long term sustainability prior to proceeding with implementation.	Woy Woy	3	16,35,112,116, 125,139, 157	GCC	RailCorp	Community	W12		\$ 500,000	\$ -	\$ 500,000		2	2	1	0	0	0	1	0	0	0	0	0	6	0	6
W17	Water and Sediment Quality	Works	Implement a program of maintenance to address the accumulation of litter in the open drain near Beach Street. Long term management of this issue should also be considered, for example, public education and/or the implementation of additional gross pollutant traps.	Ettalong	6	245	GCC		GCC	C15, W01		\$ 75,000	\$ 6,000	\$ 138,564		1	0	1	0	0	1	1	0	0	1	5	1	6		
W30	Sedimentary Processes	Works	Remove the sandstone and cement abutments from the Pretty Beach jetty and adjacent to the pool.	Pretty Beach	6		GCC		CEMC - Gsm	P39, W31		\$ 500,000	\$ -	\$ 500,000		0	1	1	0	0	1	1	0	0	0	4	2	6		
W41	Sedimentary Processes	Works	Undertake foreshore stabilisation works in the Punt Bridge area incorporating revegetation to address erosion issues.	East Gosford	2	205	GCC	Volunteers	GCC		W34	\$ 100,000	\$ 10,000	\$ 205,940		1	1	1	0	0	1	1	0	0	0	0	5	1	6	
W46	Sedimentary Processes	Works	Investigate the cause of erosion around the Blackwall Point boat ramp and develop measures to address this issue. Any necessary repairs to stabilise the foreshore and the adjacent roadway should be undertaken.	Blackwall	4	134,221	GCC		GCC	W09, W34		\$ 150,000	\$ 10,000	\$ 255,940		1	1	1	0	0	0	1	0	0	0	0	4	2	6	
W47	Sedimentary Processes	Works	Seek to remediate scouring currently occurring behind the existing seawall in Illoura Reserve. This may necessitate replacement of the existing seawall with a new, environmentally friendly seawall structure. Consideration should also be directed to the principles of "Safety by Design" to manage vandalism.	Davistown	5	39, 223	GCC		GCC	W48, W56	W34	\$ 500,000	\$ 12,500	\$ 632,425		1	2	1	0	0	0	1	0	0	0	0	5	1	6	
W55	Sedimentary Processes	Works	Identify the cause of foreshore erosion in Lance Webb Reserve and develop and implement measures to stabilise the foreshore.	Ettalong	6	247	GCC		GCC	W112	R11	\$ 200,000	\$ 7,500	\$ 279,455	NSW Coastal Management Program	1	1	1	0	0	0	1	0	0	0	0	4	2	6	
W59	Foreshore Flooding/Inundation	Works	Restore flows to Woy Woy Creek by de-commissioning the dam at the former abattoir site.	Woy Woy Creek	3		GCC	DWE	Community			Refer to linked option.	\$ -	N/A		1	1	1	1	0	0	0	0	0	0	0	4	2	6	
W82	Recreational Usage	Works	Seek to provide a publicly accessible pathway along the entire Estuary foreshore. This should be approached in a strategic fashion incorporating: a) Linkages with existing cycleways, pathways and public transport in the wider catchment, b) Safety by Design (e.g. through the provision of lighting), and c) Consideration of environmental constraints (e.g. gridded/light permeable boardwalks may be more suitable in ecologically sensitive areas).	Estuary Foreshores	All	165, 167	GCC	LPMA	Community	P50, P51, W83, W84, W94		\$ -	\$ 125,000	\$ 1,324,252		-1	-1	0	0	1	2	5	0	0	0	0	6	0	6	
W10	Water and Sediment Quality	Works	Remediate (or pipe) open drains and install sediment traps for those drains running from Wilkie King Ave and Mundoora Ave, Yattalunga.	Yattalunga	2	241	GCC		Community	W01		\$ 75,000	\$ 6,500	\$ 143,861		2	1	1	0	0	0	0	0	0	0	0	4	1	5	
W103	Recreational Usage	Works	Investigate options for ensuring the ongoing maintenance of the Yattalunga jetty and tidal pool. Issues presently observed at this location include poor access due to sedimentation and the accumulation of weeds.	Yattalunga	2	168	GCC		Community			\$ 15,000	\$ 45,000	\$ 491,731		1	1	0	0	0	1	1	0	0	0	0	4	1	5	
W114	Sedimentary Processes	Works	Investigate options to improve access to the Volunteer Coastal Patrol sufficient to permit access over the full tidal cycle.	Point Clare	2	5	NSW Maritime	GCC, LPMA	GCC	R08		\$ 170,000	\$ -	\$ 170,000		-1	1	0	0	0	0	3	0	0	0	0	3	2	5	
W122	Water and Sediment Quality	Works	Construct an additional culvert under the rail line at Fagans Bay to enhance flushing and thereby improve water quality.	Fagans Bay	1		GCC		Council			\$ 250,000	\$ -	\$ 250,000		2	1	1	1	0	0	0	0	0	0	0	5	0	5	
W13	Water and Sediment Quality	Works	Develop and implement measures to address stormwater quality issues associated with runoff from fire trails on Blackwall Mountain.	Blackwall	4	219	GCC	DECCW	GCC	W01, R24		\$ 75,000	\$ 6,000	\$ 138,564		1	2	1	0	0	0	0	0	0	0	0	4	1	5	
W14	Water and Sediment Quality	Works	Develop and implement measures to address stormwater quality issues associated with runoff from the access road and fire trails near Fisherman's Parade.	Daleys Point	6	83, 222	GCC	DECCW	GCC	W01, R25		\$ 75,000	\$ 6,000	\$ 138,564		1	2	1	0	0	0	0	0	0	0	0	4	1	5	
W15	Water and Sediment Quality	Works	Seal the Hawke Street car park to prevent erosion into Kincumber Creek. The use of permeable pavement is recommended over impermeable surfaces.	Kincumber	5	234	GCC		GCC	W01, R26		\$ 100,000	\$ 6,000	\$ 163,564		1	1	1	0	0	1	0	0	0	0	0	4	1	5	
W16	Water and Sediment Quality	Works	Investigate and implement measures to improve flow/drainage in the open channel near Mundoora Avenue.	Yattalunga	2	12, 240	GCC		GCC			\$ 150,000	\$ -	\$ 150,000		1	1	1	1	0	0	0	0	0	0	0	4	1	5	
W43	Sedimentary Processes	Works	Develop and implement a long term solution to replace the currently failing seawall in Memorial Park on Brick Wharf Road. Any option identified should wherever possible incorporate environmentally friendly features.	Woy Woy	4	216	GCC	DECCW	GCC	P62	W34	\$ 500,000	\$ 15,000	\$ 658,910		1	1	1	0	0	1	1	0	0	0	0	5	0	5	
W45	Sedimentary Processes	Works	Undertake foreshore stabilisation works to address erosion currently occurring in Palermo Reserve, Empire Bay Drive.	Daleys Point	4	220	GCC		GCC		W34	\$ 80,000	\$ 5,000	\$ 132,970		1	1	1	0	0	0	1	0	0	0	0	4	1	5	
W48	Sedimentary Processes	Works	Implement foreshore stabilisation works to prevent further erosion of the Illoura Reserve foreshore between Lintern Street and 28 Moliya Road.	Davistown	5	134, 225	GCC	Volunteers	GCC	W47, W56	W34	\$ 80,000	\$ 5,000	\$ 132,970		1	1	1	0	0	0	1	0	0	0	0	4	1	5	
W49	Sedimentary Processes	Works	Implement foreshore stabilisation works to prevent further erosion of the shoreline near Rip Road reserve.	Blackwall	4	134, 224	GCC	Volunteers	GCC		W34	\$ 80,000	\$ 5,000	\$ 132,970		1	1	1	0	0	0	1	0	0	0	0	4	1	5	

Option ID	Management Goal Addressed	Management Category	Strategy Outline	Location	Zone	Issue(s) Addressed	Primary Responsibility	Secondary Responsibility	Suggested by:	Cross Reference with Option:	Dependency on Option:	Preliminary Estimate of Capital Cost	Preliminary Estimate of Annual Maintenance/Recurrence Cost/Revenue (-ve values)	Net Present Value	Potential Funding Stream	Water & Sediment Quality	Sedimentary Processes	Ecological Processes	Foreshore Flooding/Inundation	Cultural Heritage	Visual Amenity	Recreational Usage	Development	Governance	Information, Communications and Education	Raw Benefit Index	Council / DECCW Response	Adjusted Benefit Index		
W51	Sedimentary Processes	Works	Implement measures to dissipate the energy of stormwater flows and prevent scour associated with the stormwater outlet near the corner of Jiramba and Mimosa Avenues.	Saratoga	2	239	GCC		GCC	W01	R10, W34	\$ 55,000	\$ -	\$ 55,000		1	1	1	0	0	0	0	0	0	0	0	3	2	5	
W53	Sedimentary Processes	Works	Undertake bank stabilisation works to address the erosion occurring in the creek in the region of Avoca Drive and Sun Valley Drive.	Green Point	2	243	GCC		GCC		W34	\$ 160,000	\$ 5,000	\$ 212,970		1	1	1	0	0	0	0	0	0	0	0	3	2	5	
W63	Foreshore Flooding/Inundation	Works	Investigate and implement options to address the issue of drainage from private properties along Mundoora Avenue onto the public reserve.	Yattalunga	2	12, 236	GCC		GCC			\$ 80,000	\$ 5,000	\$ 132,970		1	1	1	0	0	0	1	-1	0	0	0	3	2	5	
W85	Recreational Usage	Works	Enforce the replacement of fixed public jetties with floating pontoons where feasible.	Waterway-wide	All	15	LPMA	GCC	Community	P46, W94		\$ -	\$ 220,000	\$ 2,330,683		0	2	0	0	-2	2	2	0	0	0	0	4	1	5	
W94	Recreational Usage	Works	Provide additional facilities for disabled and less mobile people, to include access ramps, seating, disabled parking etc.	Fagan's Bay, Woy Woy, Ettalong	All	165	GCC		Community	W84, W85	R31	\$ 600,000	\$ 60,000	\$ 1,235,641		0	0	0	0	0	0	3	0	0	0	0	3	2	5	
W101	Recreational Usage	Works	Provide improved, safe access for recreational users accessing the foreshore and waterway near Victory Pde, Tascott, via re-configuration of the existing rock wall.	Tascott	2	4,183	GCC		Community		W37	\$ 275,000	\$ -	\$ 275,000		0	-1	0	1	0	1	1	0	0	0	0	2	2	4	
W112	Recreational Usage	Works	Identify measures to improve public access to Lance Webb Reserve and the beach in this location.	Ettalong	6	247	GCC		GCC	W82		\$ 50,000	\$ -	\$ 50,000		0	0	1	0	0	0	1	0	0	0	0	2	2	4	
W115	Sedimentary Processes	Works	Dredge to improve access to the boat pump-out and other facilities in Gosford Harbour. The dredging should be sufficient to permit access over the full tidal cycle.	Gosford Harbour	2	10,130	LPMA	GCC	GCC	R08		\$ 170,000	\$ -	\$ 170,000		-1	1	0	0	0	0	3	0	0	0	0	3	1	4	
W21	Sedimentary Processes	Works	Dredge from the Correa Bay boat ramp to the entrance of Woy Woy Creek, to extend 300m up the creek channel, with a view to improving drainage and access at this location.	Woy Woy	3	24.43	LPMA	GCC	Community	R08		\$ 500,000	\$ -	\$ 500,000		-1	1	1	1	0	0	1	0	0	0	0	3	1	4	
W44	Sedimentary Processes	Works	Replace collapsed stormwater drain running between the two ovals in Austin Butler Reserve and remove accreted sediments. There is a preference for the use of a natural vegetated swale and/or small wetland.	Woy Woy	4	217	GCC		GCC			\$ 100,000	\$ -	\$ 100,000		1	1	-1	1	0	0	1	0	0	0	0	3	1	4	
W52	Sedimentary Processes	Works	Investigate and implement measures to address siltation currently occurring in the open drain along the foreshore between Mundoora Access and Wilkie King Avenue. Both removal of the accreted sediments and measures to address sediment sources should be considered. There is a preference for the use of a natural vegetated swale and/or small wetland.	Yattalunga	2	241	GCC		GCC	W01	R10	\$ 80,000	\$ 5,000	\$ 132,970		1	1	1	0	0	0	0	0	0	0	0	3	1	4	
W60	Foreshore Flooding/Inundation	Works	Where possible, provide for managed retreat of infrastructure from foreshore areas likely to be affected by sea level rise on a regular basis.	Estuary Foreshores	All	92, 128	GCC, Asset Owners	DECCW	Community		P43, R40	\$ 250,000	\$ 300,000	\$ 3,428,204		0	3	3	5	-3	0	-3	-3	0	0	0	2	2	4	
W87	Recreational Usage	Works	Ensure that the navigation markers are moved, or new markers put in place as required, in accordance with movement of the associated shoals.	Waterway-wide	All	44	NSW Maritime		Community			\$ -	\$ 15,000	\$ 158,910		0	0	0	-1	0	0	4	0	0	0	0	3	1	4	
W96	Recreational Usage	Works	Provide short-term 'loading zones' for recreational users (un)loading bikes or other equipment immediately adjacent to heavily utilised recreational sites.	Estuary Foreshores	All		GCC		Cardno		R31	\$ 25,000	\$ -	\$ 25,000		0	0	0	0	0	0	3	0	0	0	0	3	1	4	
W109	Recreational Usage	Works	Investigate and implement suitable options for improving drainage of the oval located near Willaroo Road.	Saratoga	4	229	GCC		GCC			\$ 250,000	\$ 10,000	\$ 355,940		0	0	0	1	0	0	1	0	0	0	0	2	1	3	
W120	Sedimentary Processes	Works	Dredge to improve access to the boat pump-out and other facilities in Hardy's Bay. The dredging should be sufficient to permit access over the full tidal cycle.	Hardy's Bay	6	74,86,130	LPMA	GCC	Community	R08		\$ 200,000	\$ -	\$ 200,000		0	1	0	0	0	0	1	0	0	0	0	2	1	3	
W23	Sedimentary Processes	Works	Deepen and widen the outlets of Mudflat and RSL Creeks in Hardy's Bay so that both creeks restore tidal flushing. The efficacy of this option in improving flushing should be assessed prior to undertaking the works.	Mudflat and RSL Creeks	6	74,157	LPMA, GCC		CEMC - GS, Community	W06, W27, W34		\$ 160,000	\$ -	\$ 160,000		-1	1	1	1	0	0	0	0	0	0	0	2	1	3	
W31	Sedimentary Processes	Works	Investigate options to address the accretion of sediments along the eastern shoreline along Pretty Beach, including those that have built up in the swimming pool.	Pretty Beach	6	79, 168	GCC		CEMC - GS	P39, W30, W32		\$ 30,000	\$ -	\$ 30,000		-1	1	2	0	0	0	1	0	0	0	0	3	0	3	
W32	Sedimentary Processes	Works	Dredge sediments around the boat launching pontoon at Pretty Beach to enable boats to tie up on both sides of the pontoon.	Pretty Beach	6	95	LPMA	GCC	CEMC - GS	W31, W33		\$ 55,000	\$ 120,000	\$ 1,326,282		-1	1	2	0	0	0	1	0	0	0	0	3	0	3	
W54	Sedimentary Processes	Works	Investigate and implement measures to address the eroding seawall located near Araluen Drive on the southern side of Hardy's Bay. Preferred options include re-establishment of native vegetation or an environmentally friendly seawall.	Hardy's Bay	6	244	GCC		GCC		W34	\$ 320,000	\$ 10,000	\$ 425,940		0	1	1	0	0	0	0	0	0	0	0	2	1	3	
W66	Habitat and Species Conservation	Works	Provide fish friendly structures where new instream structures are being constructed.	Catchment Tributaries	All		GCC, RTA	I&I NSW	Cardno	W67		\$ -	\$ 60,000	\$ 635,641	Recreational Fishing Trust	0	0	1	0	0	0	0	0	0	0	0	0	1	2	3
W67	Habitat and Species Conservation	Works	Identify existing instream infrastructure (e.g. weirs and culverts) for replacement or retrofitting to fish friendly status.	Catchment Tributaries	All		GCC, RTA	I&I NSW		W66		\$ 10,000	\$ 60,000	\$ 645,641	Recreational Fishing Trust	0	0	1	0	0	0	0	0	0	0	0	0	1	2	3
W09	Water and Sediment Quality	Works	Investigate appropriate WSUD features for those roads that are currently unsealed/unfinished in order to reduce the impact of erosion and sedimentation from these roadways.	Woy Woy, Blackwall	All	108	GCC		Community			\$ 1,200,000	\$ 35,000	\$ 1,570,790		2	2	-4	-1	0	1	0	1	0	0	0	1	1	2	
W102	Recreational Usage	Works	Provide recreational facilities at Yattalunga Reserve.	Yattalunga Reserve	2		GCC	LPMA	Community		P41, R31	\$ 75,000	\$ 12,500	\$ 207,425		0	0	0	0	0	0	1	0	0	0	0	1	1	2	
W110	Recreational Usage	Works	Provide a shared pedestrian pathway/cycleway in the reserve near Carrak Road to improve recreational access and link with other areas.	Kincumber	5	167, 230	GCC		GCC		W82	\$ 250,000	\$ 5,000	\$ 302,970		0	0	0	0	0	0	1	0	0	0	0	1	1	2	
W116	Sedimentary Processes	Works	Dredge to improve navigation and access to boat ramps in Cockle Channel.	Davistown	5	1, 45, 46, 47, 53, 60, 178, 228	LPMA	GCC	Community	R08, R09	P07	\$ 250,000	\$ 37,500	\$ 647,276		-1	1	0	0	0	0	1	0	0	0	0	1	1	2	
W117	Sedimentary Processes	Works	Dredge to improve navigation in Woy Woy Channel near Pelican Island.	Woy Woy	4	42,129,130	LPMA	GCC	Community	R08, R09	P07	\$ 250,000	\$ 37,500	\$ 647,276		-1	1	0	0	0	0	1	0	0	0	0	1	1	2	
W19	Sedimentary Processes	Works	Undertake an ongoing program of maintenance to restore the drainage canals of St Hubert's Island to their original design criteria.	St Hubert's Island	4	29,32	LPMA	GCC	CEMC - RS	R08, R09		\$ 750,000	\$ 125,000	\$ 2,074,252	Note: There would be an annual income from fees paid by residents for their foreshore facilities. \$25k p.a.	-1	2	-2	0	0	0	1	0	0	0	0	0	2	2	
W58	Foreshore Flooding/Inundation	Works	Control mangrove growth where they are affecting key drainage channels. This should be undertaken (where permissible) under the relevant permit or licence.	Catchment Tributaries	All	73,77	GCC	Volunteers	Community			\$ 55,000	\$ 22,000	\$ 288,068	NSW Floodplain Management Program	-1	1	-2	3	0	0	0	0	0	0	0	0	1	1	2
W64	Foreshore Flooding/Inundation	Works	Undertake to improve drainage in the creek by dredging accreted sediments near Avoca and Sun Valley Drives.	Green Point	2	242	GCC		GCC	W01		\$ 55,000	\$ -	\$ 55,000		0	1	-1	1	0	0	0	0	0	0	0	1	1	2	
W98	Recreational Usage	Works	Provide additional public open space areas incorporating walking tracks in the Woy Woy area (to the waterfall and through the former abattoir site).	Woy Woy	3		GCC		Community	W82		\$ 250,000	\$ 20,000	\$ 461,880		0	-1	0	0	0	1	1	0	0	0	0	1	1	2	
W107	Recreational Usage	Works	Provide dedicated parking for users of the boat ramp near Punt Bridge. This would require some initial consideration of feasibility prior to implementation.	Central Coast Hwy	2	204	GCC		GCC		P41	\$ 80,000	\$ 5,000	\$ 132,970		0	0	-1	0	0	0	1	0	0	0	0	1	1	1	

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W118	Sedimentary Processes	Works	Dredge to improve navigation in Woy Woy Bay.	Woy Woy Bay	3	130	LPMA	GCC	Community	R08		\$ 200,000	\$ -	\$ 200,000		-1	1	0	0	0	0	1	0	0	0	0	0	0	1	
W121	Sedimentary Processes	Works	Investigate options to address access and amenity issues associated with the blockage of the entrance to Riley's Bay and sediment accretion in this area.	Riley's Bay	6		LPMA	GCC	Community	R08		\$ 50,000	\$ -	\$ 50,000		-1	1	0	0	0	0	1	0	0	0	0	1	0	1	
W25	Sedimentary Processes	Works	Dredge in the Saratoga (Paddy's and Lintern) Channel(s) and around the boat ramps to permit better access.	Saratoga and Green Point	2	1,8,9,129, 178, 233	LPMA	GCC	Community	R08, R09		\$ 600,000	\$ -	\$ 600,000		-1	1	-1	0	0	0	1	0	0	0	0	0	1	1	
W50	Sedimentary Processes	Works	Undertake minor dredging works to improve access to the Centennial Street boat ramp.	Saratoga	4	178, 226	LPMA	GCC	GCC			\$ 80,000	\$ -	\$ 80,000		-1	1	-1	0	0	0	1	0	0	0	0	0	1	1	
W105	Recreational Usage	Works	Extend Orana St boat ramp to permit access at low tide.	Green Point	2	197	GCC		GCC			\$ 75,000	\$ -	\$ 75,000		0	-1	-1	0	0	0	1	0	0	0	0	-1	1	0	
W20	Sedimentary Processes	Works	Dredge the sand bars in the channel between Blackwall Point and Allfield Road, Woy Woy, with a view to improving navigation.	Woy Woy	3	23	LPMA	GCC	Community	R08		\$ 360,000	\$ -	\$ 360,000		-1	1	-2	0	0	0	1	0	0	0	0	-1	1	0	
W24	Sedimentary Processes	Works	Deepen and widen the entrance to Hardy's Bay to permit greater tidal flushing. The efficacy of this option in improving flushing should be assessed prior to undertaking the works. In addition, the environmental aspects must also be considered.	Hardy's Bay	6	112	LPMA	GCC	CEMC - GSM, Community	R08		\$ 500,000	\$ -	\$ 500,000		-1	2	-2	0	0	0	1	0	0	0	0	0	0	0	0
W81	Recreational Usage	Works	Seek to provide additional facilities for the boating community to include slipways, shipwright services, travel lifts, re-fuelling areas and hard stand areas. The form and location of these additional facilities should be such that they are accessible by a range of vessels over the full tidal cycle.	Estuary Foreshores/ Waterway-wide	All	70, 177	LPMA	GCC	Community	P35, W02, W85	R31, P41	\$ -	\$ 220,000	\$ 2,330,683	NSW Maritime Infrastructure Program	-3	-2	-2	0	0	-2	4	4	0	0	0	-1	0	-1	
W108	Recreational Usage	Works	Undertake review of need requirements for the tidal baths located near Brisbane Water Drive.	Woy Woy	4	227	GCC		GCC		P41	\$ 250,000	\$ 10,000	\$ 355,940		0	-1	-1	0	0	0	1	0	0	0	0	-1	-1	-2	