4. MANAGEMENT ACTIONS

Actions have been developed from the short-listed options described in *Stage 3 Management Options Study* (Hydrosphere Consulting, 2019b) and consist of a combination of studies, investigations and on-ground works. Some actions require additional research or assessment prior to implementation of on-ground works. This is to ensure the appropriate effort, funding and geographical focus of on-ground works is undertaken.

Management strategies and actions have been developed for a ten year period. This CMP and the progress of the management actions should be reviewed to ensure the actions remain relevant and the implementation of the plan is being achieved.

The recommended management actions have been described in terms of:

- Desired Outcome – the specific result to be achieved by implementation of each action.
- Priority Ranking – each action has been assigned a rank and priority according to importance and urgency for implementation. The ranking is based on multi-criteria analysis completed as part of *Stage 3 Management Options Study* (Hydrosphere Consulting, 2019b). The following priority categories have been assigned to the ranking:

Table 5: Priority Ranking

Priority	Description
Fundamental	Actions that are critical for successful implementation of the CMP and important for long-term effective management of the lake
High	Actions of high importance in addressing key threats and issues
Medium	Actions considered of medium importance in addressing threats and issues

- Description of Tasks – an outline of the scope of works required.
- Responsibility – the actions identify the Lead Organisation as well as Support Organisation(s). Lead Organisations are responsible for implementation of the action. Support Organisation(s) may be required and/or requested to assist in implementation of the action, either through on-ground works, or as a potential funding or information source.
- Cost Estimate – an estimate of total costs for implementation over the ten year life of the plan is provided (2020$). Section 5 (CMP Business Plan) provides a breakdown of action costs including capital, operational and maintenance costs. Cost estimates cover the tasks listed in the actions (including preliminary investigations, environmental assessment, approvals and implementation) unless otherwise stated. Cost estimates provided in the action descriptions are preliminary only and are based on the best available information.
- Potential Funding – the CMP actions are expected to be funded through Council and State Government contributions, monetary grants and in-kind contributions. Identification of grants and successful application is an important component of this CMP. A summary of potentially relevant and available grant schemes is given in Section 5.1. It is important to note that many grants and funding sources are only available up to a limited budget and as such, the available grants are changing from year to year. It will be necessary to keep abreast of current funding availability throughout the implementation of the CMP. In most cases it is expected that in-kind contributions will be provided by Council. Collaboration with educational institutions may also provide opportunities for research projects.

Where actions are implemented through an existing program, additional expenditure and funding have not been included. Similarly, where a study/review is required to determine the appropriate level of expenditure, the cost of the review has been estimated in the action planning. Implementation costs should be confirmed by the results of the review.

- Timing – indicative timeframe for implementation and alignment with Council's four year Delivery Program (DP) under the NSW Integrated Planning and Reporting (IP&R) Framework (refer Section 5, Business Plan for more details) which commenced in 2018/19 (2019). Based on the priorities developed in this CMP, timeframes for management actions have been estimated, pending funding availability. The assumed start date for CMP implementation is 1 July 2020, following Council adoption of the Plan. The CMP has a planning timeframe of ten years therefore the duration of the Plan implementation period is from 1 July 2020 to 30 June 2029. Management actions have been scheduled according to the following timeframes:
    - Short term: year 1 – 3 (DP1 2020 – 2022).
    - Medium term: year 4 – 7 (DP2 2023 – 2026).
    - Long term: year 8 – 10 (DP3 2027 - 2029).
    - On-going: starting year 1 and implemented over the ten year life of the CMP with possible extension beyond that period.

  Actions within the CMP align with Council's key services identified in the BSC *Delivery Program 2019-2023*. Timing of the delivery of actions should be based on the priorities developed for this CMP but will also depend on the availability of funding.
- Location – location of actions within Lake Ainsworth.
- Performance targets – performance targets for each action which can be used to measure the level of success. Identified targets incorporate those consistent with Council's Community Strategic Plan and targets specific to each action where applicable.

The actions are described in the following sections and have been grouped into management units. Figure 3 provides an overview of CMP management actions for Lake Ainsworth.

In addition to management actions to be implemented as part of this CMP, Appendix 2 details additional management requirements identified to protect the lake from coastal hazard impacts (e.g. coastal recession, oceanic break-through and wave run-up and dune overtopping). The *Coastal Zone Management Plan for the Ballina Shire Coastline* (CZMP, GeoLINK, 2016) currently provides a framework for open coast hazard management but will be replaced by a Coastline CMP in the future (i.e. by December 2021).The management requirements identified during the development of this Lake Ainsworth CMP will be considered separately in the development of the future Ballina Coastline CMP.

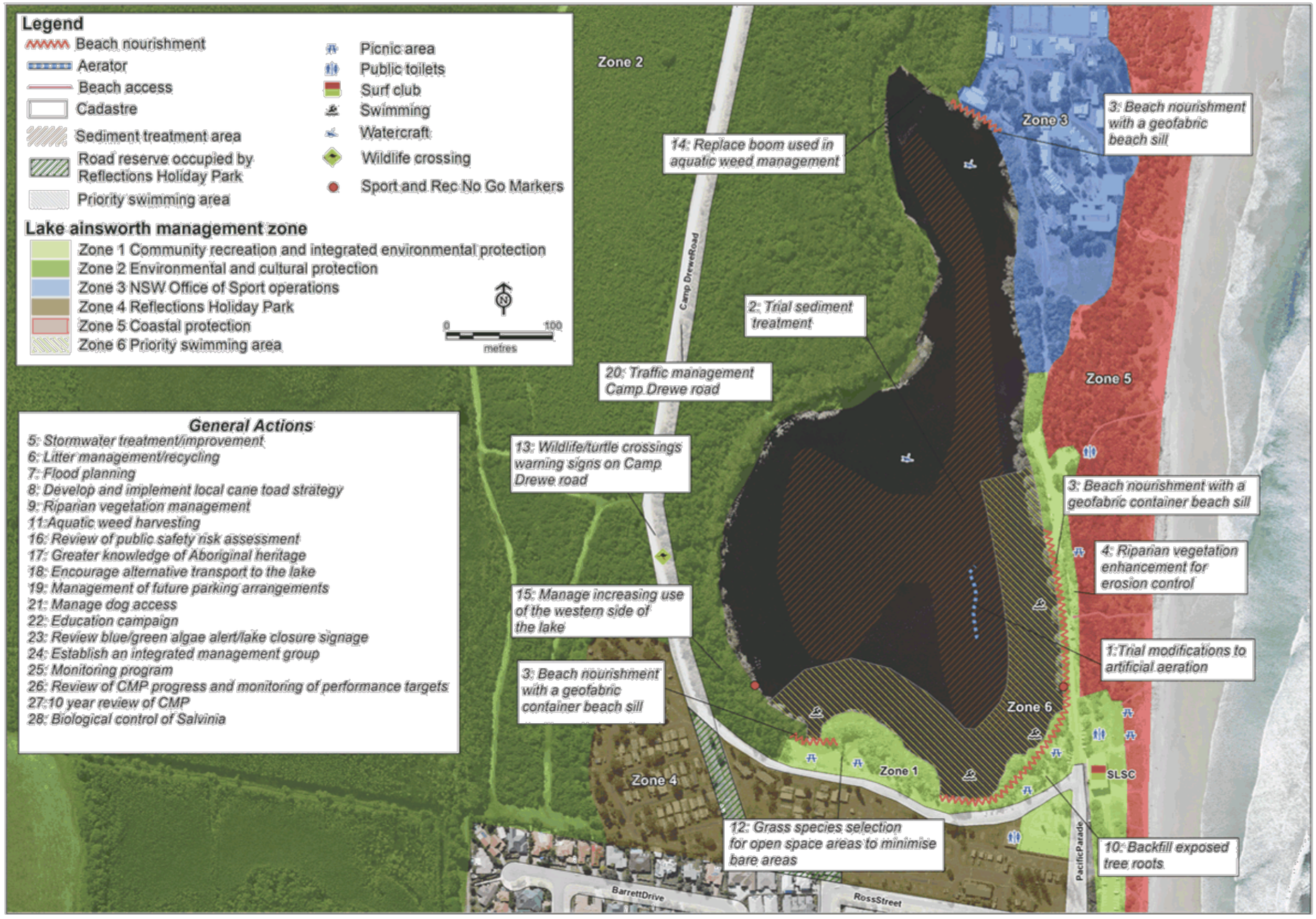

Figure 3: Summary of Lake Ainsworth CMP management actions

Map is indicative only. It is to be used solely for illustrative purposes and does not form any part of local, state or federal planning law.

4.1 Actions to be implemented by Ballina Shire Council

4.1.1 Water quality

Action 1: Trial modifications to artificial aeration

Desired Outcome	Determine the best aerator regime for the lake for water quality improvements
Priority ranking	High (1)
DESCRIPTION OF TASKS:	
Conduct a trial to test the effects of modifying the aeration program on lake water quality and specifically the incidence of blue green algae blooms. The following modifications are proposed: 1. **Phase 1 Aerator Trial:** a. Design monitoring program for the trial to assess the effectiveness of modifications. Design of the monitoring program will need to provide adequate replication of previous monitoring to allow for comparison with previous water quality results under different aerator regimes. Key areas to be assessed include dissolved oxygen levels through the water column (depth profiles) with a focus on the sediment/water interface at a number of locations around the lake. This will be critical to determining the effectiveness of the modified regime and identifying the 'zone of influence' for the aerators. Overall water quality conditions will also be assessed incorporating measurements of blue green algae, nutrients, DO, pH and temperature at surface and at depth (profiles). b. Trial spring/ summer aeration program with continuous operation (24 hour aeration, opposed to the current program where aerators operate 12 hours overnight) and monitor conditions. c. Trial a gradual start-up procedure in spring to observe the effect on water quality conditions in the initial aerator operation period (i.e. aim to allow acclimation and avoid a major turnover event). d. Reporting of trial completed including analysis of monitoring data. Based on the results, further management is to be recommended. This may include: • Continuation of the modified regime if water quality improvements were observed, • Consider the need for additional diffusers spaced around the lake (if the 'zone of influence' of current aerators is considered inadequate) or • If Phase 1 trials do not improve water quality conditions to an acceptable level, move to Phase 2. 2. **Phase 2 Aerator Trial:** a. Trial one year without artificial aeration (i.e. turn off aerators). This will allow for the assessment of seasonal changes and comparison with previous water quality conditions under past aerator regimes. b. Monitoring as described for Phase 1 above with an additional focus on development of anoxic (low oxygen) zones at depth to provide forewarning of potential low dissolved oxygen events developing under stratified conditions. c. Reporting of trial including recommendations for further management.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries
Total Cost Estimate (10 yr)	$110,000 (allowance of $10,000 for extended aerator operation Yr2, $50,000 for monitoring Yr2 & Yr3)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short term (DP1 2020-2023)
Location	In-lake, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Design of monitoring program complete prior to spring aeration September 2020. • Phase 1 trial report complete by June 2021. • Phase 2 trial report complete by June 2022.

4.1.2 Sediment management

Action 2: Trial sediment treatment

Desired Outcome	To improve and maintain water quality and ecosystem health of the lake and surrounding habitats
Priority ranking	High (2)
DESCRIPTION OF TASKS:	
Conduct a trial to test the suitability and effectiveness of application of a phosphorus binding agent (e.g. Phoslock™) to lake sediments in order to improve water quality and specifically the incidence of blue green algae blooms. The following stages are proposed: 1. Liaison with regulatory authorities including DPI Fisheries to determine and obtain approvals as required. 2. **Phase 1 test-tube study:** a. Laboratory tests and simulated lake environments using sediment and water from the lake (i.e. out-of-lake 'test-tube' studies). b. The study would determine aspects such as application rates, longevity of treatment, timing and evaluation of potential risks (e.g. effects on colour, water clarity, and water chemistry). If results of the out of lake studies were positive, move to next phase. A report should be finalised to confirm the next steps. This may include recommendations for community consultation and provision of results. 3. **Phase 2 mesocosm study:** a. Small-scale in-lake study where areas of the lake are isolated to test how the treatment effects water quality. 'Mesocosms' are routinely used for this purpose to isolate the water column from the lake surface to the lake bottom. b. The study would assess the same aspects described for Phase 1 above, but allow for conditions to be assessed in 'real-life' subject to lake conditions (e.g. weather, hydrodynamics, aquatic fauna etc.). Dependant on design and location the study could also allow for the community to observe the process and effects first hand. If results of the in-lake studies were positive, move to next phase. 4. **Phase 3 lake application:** a. Typical lake application would involve binding agent granules or slurry being directly added to the water via a barge or boat. The compound is designed to settle out through the water column binding phosphate and eventually collect as a thin (< 2 mm) layer over sediments creating a barrier layer and preventing further phosphorus release. b. Monitoring will be required to assess the effectiveness of the treatment. Design of the monitoring program will need to provide adequate replication of previous monitoring to allow for comparison with previous water quality results.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, DPI Fisheries
Total Cost Estimate (10 yr)	$220,000 (allowance of $40,000 for Phase 1 and 2 studies, $160,000 for lake application in Yr4 and $10,000/yr monitoring in Yr4 & Yr5)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short-Medium term (DP1 2020-2022 and DP2 2023-2026)
Location	In-lake, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Phase 1 report completed by June 2023. • Phase 2 study established by September 2023. • Phase 3 lake application, assumed to be complete by June 2024, (timing to be confirmed by Phase 2 results).

4.1.3 Bank erosion

Action 3: Beach nourishment with a geofabric container beach sill

Desired Outcome	Improved public safety and amenity of foreshores and stabilisation of bank erosion and riparian vegetation
Priority ranking	High (3)
DESCRIPTION OF TASKS:	
1. Detailed design of erosion controls including consideration of: a. Preferred option to nourish the lake's recreational beaches with clean sand and installation of buried geofabric containers along beach faces (i.e. parallel to the shoreline) to act as sills to maintain minimum beach levels and reduce the rate of sand loss. b. The size and placement depth of geofabric containers requires detailed design to achieve the most effective configuration. Trials are currently underway at the lake which will help inform further design. c. Sill(s) are to be located away from the key recreational use elevations. d. Sources of nourishment material and associated costs. Utilisation of scraped sand from the lake would be much more cost effective and should be considered where this is appropriate and can be achieved without negative impact on environmental and aesthetic values. e. Nourishment could also incorporate infilling around exposed tree roots to improve tree health and protect riparian vegetation (refer Action 10: Backfill exposed tree roots). f. Clean up of remnant materials/infrastructure such as fencing, log revetment, etc. g. Maintenance of erosion controls as informed by the annual erosion monitoring (refer Action 24: Monitoring program). 2. Liaison with regulatory authorities including DPI Fisheries. 3. Uncertake environmental assessment and obtain approvals. 4. Seek funding approval. 5. Implementation.	
Lead Organisation	BSC, NSW Office of Sport
Support Organisation	EES – Coast and Estuaries, DPI Fisheries
Total Cost Estimate (10 yr)	$265,000 (Allowance of $50,000 for detailed design, $200,000 for nourishment with geobags and $5,000 for maintenance every three years)
Potential Funding Sources	BSC, NSW Office of Sport , NSW Coastal and Estuary Grants Program
Timing	Short- term initial works (DP1 2020-2022) and ongoing maintenance (DP1 - DP3 2020-2029)
Location	Zone 1, Zone 2, Zone 3, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Detailed design completed by June 2022. • Public safety assessment assigns low risk to all foreshores by June 2023.

Action 4: Riparian vegetation enhancement for erosion control

Desired Outcome	Improved public safety and amenity of foreshores and stabilisation of bank erosion and riparian vegetation
Priority ranking	High (7)
DESCRIPTION OF TASKS:	
1. Conduct an assessment of riparian vegetation along the eastern and southern foreshores following completion of Foreshore Improvement Works. This assessment will determine areas for further riparian revegetation and/or enhancement along shorelines for greater erosion protection. 2. Plan works considering the balance between access requirements, bank protection and ecological values. Provision for managing access to these areas will need to be considered as part of the design of works. 3. Carry out initial works as required (i.e. planting, fencing, access provision). 4. Follow up weed control and maintenance will be needed for at least 3-5 years. Depending on the success of works maintenance may be scaled back as native vegetation becomes established. Riparian Condition Assessment (refer Action 24: Monitoring program) to inform ongoing management.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, Lennox Landcare
Total Cost Estimate (10 yr)	$70,000 (Allowance of $20,000 for initial planning and planting work, $5,000/yr for ongoing maintenance)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short- term initial works (DP1 2020-2022) and ongoing maintenance (DP1 - DP3 2020-2029)
Location	Zone 1, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Riparian assessment completed by June 2021.

4.1.4 Catchment management

Action 5: Stormwater treatment/improvement

Desired Outcome(s)	Best-practice stormwater treatment systems are installed and maintained Continuation of low-impact land management practices in the catchment
Priority ranking	Medium (17)
DESCRIPTION OF TASKS:	
Stormwater management: 1. Best practice stormwater treatment and improvement to be implemented during the design, retrofit and/or upgrade of any development including roads and parking facilities in the catchment. Designs to include measures to reduce erosion through management of concentrated overland flows. 2. Regularly assess the condition and performance of stormwater treatment systems and devices (refer Action 24: Monitoring program). 3. On-going maintenance/ asset renewal/ replacement of stormwater treatment systems. Land management practices: 1. Continue practices to prevent grass clippings from entering stormwater drains and/or the lake (e.g. use a catcher when mowing and remove clippings). 2. Continue policy of no fertiliser use within lake foreshore areas and Reflections Holiday Park. Continue best-practice management of fertiliser application to sports oval on NSW Office of Sport managed land including minimising fertiliser use in general and avoiding use before, during or immediately after rainfall. Encourage best-practice management of fertiliser application within all catchment areas including residential areas through Action 22: Education campaign. 3. Continue careful management and use of materials imported to the catchment that may introduce nutrients or contamination (e.g. mulch, compost, soil, blue metal, pesticides and herbicides etc.). 4. Large public events within the study area should be supported by an appropriate environmental assessment that addresses and mitigates any potential adverse impacts on the lake and surrounding natural environment.	
Lead Organisation	BSC
Support Organisation	NSW Office of Sport, NSW Crown Holiday Parks Land Managers, EES – Coast and Estuaries
Total Cost Estimate (10 yr)	Staff time and allowance of $40,000 for maintenance/ asset renewal/ replacement of stormwater treatment systems
Potential Funding Sources	BSC
Timing	Ongoing maintenance (DP1 - DP3 2020-2029)
Location	Catchment area (all zones), CMA1 – Coastal Wetlands and Littoral Rainforests, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Best practice stormwater treatment and improvement implemented for all new development. • Water quality monitoring does not indicate stormwater pollution impacts

Action 6: Litter management/recycling

Desired Outcome	Improve waste management and education to reduce litter impacting on amenity, water quality and wildlife.
Priority ranking	High (8)
DESCRIPTION OF TASKS:	
1. Assess adequacy of general waste bins and waste collections and provide additional bins and collections as required. 2. Provide recycling bins in addition to general waste bins at the lake. 3. During peak times such as long weekends and school holiday periods, consider increased frequency of rubbish collection and/or placement of additional bins (either standard bins or small temporary skip bin, with cover) on site to reduce the likelihood of overflow and litter polluting the lake environment. 4. Acknowledge and support community groups/individuals that regularly clean up litter at the lake. 5. Reinforce messaging through the education program (refer Section 4.1.8 Education).	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, North East Waste, Community groups/individuals who regularly clean up litter at the lake
Total Cost Estimate (10 yr)	$50,000 (Allowance of $5,000/yr for extra bins and collection services during peak times)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program, NSW EPA Waste Less, Recycle More initiative.
Timing	Ongoing (DP1 - DP3 2020-2029)
Location	Lake and surrounds (all zones), CMA1 – Coastal Wetlands and Littoral Rainforests, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Recycling bins in place by June 2021. • Reduction in volume of waste collected during Clean up Australia Day

4.1.5 Flooding

Action 7: Flood planning

Desired Outcome	Ensure all development and management actions in the study area are suitable for the location and/or are adaptive to changing flooding risk.
Priority ranking	Medium (12)
DESCRIPTION OF TASKS:	
1. Future development in the catchment and all actions implemented as part of this CMP will need to consider the potential future flood risk. 2. Lake Ainsworth catchment to be included in the review of the *Ballina Floodplain Risk Management Plan* (BMT WBM, 2015). Plan works considering the balance between access requirements, bank protection and ecological values. Provision for managing access to these areas will need to be considered as part of the design of works.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries
Total Cost Estimate (10 yr)	Staff time
Potential Funding Sources	n/a
Timing	Short- term (DP1 2020-2022)
Location	Flood risk areas identified in *Stage 2 Vulnerabilities and Opportunities Study* (Hydrosphere Consulting, 2019a), CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Review of *Ballina Floodplain Risk Management Plan* includes the Lake Ainsworth catchment.

4.1.6 Flora and fauna

Action 8: Develop and implement local cane toad management strategy

Desired Outcome	Reduce cane toad numbers and their undesirable impacts on native wildlife.
Priority ranking	Medium (18)
DESCRIPTION OF TASKS:	
1. Develop an integrated local Cane Toad Management Strategy for the lake, considering the range of control methods discussed in *Stage 2 Vulnerabilities and Opportunities Study*. Consult with NSW DPI and NPWS and NSW Office of Sport regarding regional and local cane toad management. 2. Implement program. 3. Review data, methods and strategy on an annual basis.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, NPWS, DPI
Total Cost Estimate (10 yr)	$55,000 (Allowance of $20,000 for strategy development and $5,000/yr for implementation and review)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Ongoing (DP1 - DP3 2020-2029)
Location	Lake and surrounds(all zones), CMA1 – Coastal Wetlands and Littoral Rainforests, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Local Cane Toad Management Strategy completed by June 2023. • Annual reviews completed.

Action 9: Riparian vegetation management

Desired Outcome	To improve condition and extent of natural fringing vegetation around lake.
Priority ranking	Medium (13)
DESCRIPTION OF TASKS:	
1. Complete regular maintenance, weed control and enhancement of foreshore vegetation for all foreshores. 2. Further planting of native reed beds along lake foreshores is also considered appropriate in some areas to assist in ongoing erosion control, managing access, enhancing habitat value and minor nutrient uptake. 3. Fencing as required to protect sensitive areas.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, Lennox Landcare
Total Cost Estimate (10 yr)	$120,000 (Allowance of $30,000 in the first year to establish new areas including fencing and $10,000/yr for ongoing works weed control and maintenance)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Ongoing (DP1 - DP3 2020-2029)
Location	Lake foreshores Zone 1, Zone 2, Zone 3, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Riparian condition assessment completed annually shows improved condition ratings.

Action 10: Backfill exposed tree roots

Desired Outcome(s)	To improve the health of Broad-leaved Paperbark trees along lake foreshores To reduce trip hazards, access issues and improve public safety To improve and maintain water quality and ecosystem health of the lake
Priority ranking	High (4)
DESCRIPTION OF TASKS:	
1. Backfill exposed roots of mature Broad-leaved Paperbark trees along the south-east foreshore with suitable sand. Ideally the sand should match the natural substrate and have minimal nutrient/fertiliser content. This option can be integrated with the nourishment of the lake's beaches (refer Action 3: Beach nourishment with a geofabric container beach sill). 2. Provide vegetation cover over the placed sediment either as turf or native groundcovers will assist in preventing movement of the placed material either through pedestrian access or wind and wave action. 3. Temporary fencing may be required to prevent pedestrian access in the short term to allow vegetation cover to establish. 4. Monitor tree health and root cover and maintain as needed.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries
Total Cost Estimate (10 yr)	$56,000 (Allowance of $50,000 for additional backfill, fencing and groundcovers, $2,000 every three years for maintenance)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short- term initial works (DP1 2020-2022) and ongoing maintenance (DP1 - DP3 2020-2029)
Location	Lake foreshores Zone 1, Zone 2, Zone 3, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Action 16: Review of public safety risk assessment assigns low risk to all foreshores by June 2021.

Action 11: Aquatic weed harvesting

Desired Outcome	To reduce aquatic weeds and improve recreational opportunities and aesthetics.
Priority ranking	Medium (21)
DESCRIPTION OF TASKS:	
1. Continue manual harvest of aquatic weeds from the lake by community volunteers as needed to control outbreaks. 2. BSC to continue to assist in removal and disposal of the harvested plants. 3. Ensure disposal of weeds to registered waste facility. If left to decompose on lake shore, rotting vegetation can create aesthetic issues (odour, visual) and nutrients and contaminants may be re-introduced to lake. 4. Annual review of program.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, Lennox Landcare, NSW Office of Sport
Total Cost Estimate (10 yr)	$10,000 (Allowance of $1,000/yr for transport and disposal of weeds)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Ongoing (DP1 - DP3 2020-2029)
Location	In-lake, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Annual review of program including assessment of aquatic weed abundance

Action 12: Grass species selection for open space areas to minimise bare areas

Desired Outcome	Enhanced aesthetics, recreational values and protection against erosion.
Priority ranking	Medium (11)
DESCRIPTION OF TASKS:	
1. Monitor success of new turf installed as part of Foreshore Improvement Works. 2. If required, complete further investigation of durable grass types for high use areas along the lake foreshore. Ideal characteristics would include being able to withstand dry conditions and high levels of foot traffic, while being shade tolerant and salt resistant. The ability for grasses to spread via runners or wind-dispersed seed and impacts on nearby natural vegetation areas should also be considered. 3. Selection of suitable grass species. 4. If required, purchase and install alternative turf. 5. Provide adequate weed guards/edging to separate turfed areas from natural riparian vegetation and revegetation areas. Edging to extend down into the soil to prevent the spread of underground grass runners invading natural areas.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, Lennox Landcare
Total Cost Estimate (10 yr)	Staff time, and allowance of $85,000 to replace turf in Zone 1 if required
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short-Medium term (DP1 2020-2022 and DP2 2023-2026)
Location	Lake foreshores Zone 1, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Recommendations for alternate grass species by June 2023 if current turf unsatisfactory.

Action 13: Wildlife/turtle crossing warning signs on Camp Drewe Road

Desired Outcome	Raise awareness of the presence of native fauna and need for care to be taken to avoid road kill.
Priority ranking	Medium (14)
DESCRIPTION OF TASKS:	
1. Review current signage in consultation with local community and particularly wildlife groups in Lennox Head. 2. Design signage and placement considering potential nesting areas, known crossing locations and seasonality. 3. Promote and educate through Action 22: Education campaign. 4. Monitor road kill (refer Action 24: Monitoring program) and review signage as needed. Linked to Action 20: Traffic management Camp Drewe Road (measures to manage traffic speed)	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, RMS
Total Cost Estimate (10 yr)	$10,000 (staff time and allowance of $5,000 for new signage and $5,000 for replacement/renewal at Yr5)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short-Medium term (DP1 2020-2022 and DP2 2023-2026)
Location	Camp Drewe Road, Zone 2, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Review complete September 2020. • Signage installed December 2020.

Action 14: Replace boom used in aquatic weed management

Desired Outcome	Allow for effective ongoing control of aquatic weeds when high densities occur.
Priority ranking	Medium (20)
DESCRIPTION OF TASKS:	
1. Determine boom specifications and investigate most effective options. 2. Obtain quotes. 3. Replace boom.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries
Total Cost Estimate (10 yr)	$10,000 (Allowance of $10,000 for boom replacement)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short- term (DP1 2020-2022)
Location	In-lake, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Boom replaced by June 2021.

4.1.7 Community uses

Action 15: Monitor and manage increasing use of the western side of the lake

Desired Outcome(s)	To preserve the relatively 'untouched' ecosystem along the western shoreline, while providing formalised access to a limited section in order to reduce impacts resulting from concentrated use. To protect habitat values, water quality, Aboriginal Heritage, scenic values and ecosystem health of the lake.
Priority ranking	High (10)
DESCRIPTION OF TASKS:	
Develop an overall concept for the western side of the lake in order to appropriately protect environmental and cultural values while managing increasing visitor pressures. 1. Engineering design: key considerations and priorities would include: a. Review results of monitoring western foreshore usage collected over 1 year as part of Action 24: Monitoring program. b. Establishment of ecological and cultural heritage protection areas for the majority of the western side. c. Educational facilities and weed management. d. Provision for creating more formalised access in the south-western corner. Formal access is restricted to the south-west corner of the western side and is to be in keeping with low-impact, natural-looking access (i.e. no concrete and bitumen). This area would provide a combination of ecological protection and additional passive recreational opportunities. It acknowledges the likelihood of increased use of the western side of the lake and seeks to manage and confine access to this corner while protecting the remaining western side as an ecological protection zone. e. Informal parking along Camp Drewe Road will also need to be restricted to manage visitor numbers and access to the western shoreline. f. Rationalise access to the western side of the lake by selecting a preferred access path and formalising this route, while closing off and revegetating the remaining tracks. This may involve removal of existing fencing and provision of formal tracks with fencing as required to direct pedestrians away from sensitive areas (e.g. lake edges). g. There is also opportunity for pedestrian/shared path facilities along Camp Drewe Rd with the purpose of providing separation between pedestrians and traffic and increased amenity for dog walkers, bikes etc. h. Community consultation including local Aboriginal representatives. 2. Approvals: development consent (and environmental assessment). 3. Construction to be staged based on established priorities and available funding.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries
Total Cost Estimate (10 yr)	$300,000 (Allowance of $25,000 concept development, $75,000 detailed design, approvals and consultation and $200,000 construction)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short-Medium term (DP1 2020-2022 and DP2 2023-2026)
Location	Western side of lake, Zone 2, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Monitoring of monitoring western foreshore usage complete by June 2021. • Engineering design complete by June 2022. • Approvals received by December 2022.

Action 16: Review of public safety risk assessment

Desired Outcome	To ensure public safety at lake access points
Priority ranking	High (5)
DESCRIPTION OF TASKS:	
1. Once the Lake Ainsworth Foreshore Improvement Works program has been finalised, review and update the public risk assessment completed as part of *Stage 2 Vulnerabilities and Opportunities Study*. 2. Based on the results of the updated assessment, recommend actions for any remaining risk areas.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries
Total Cost Estimate (10 yr)	$10,000 (Allowance of $5,000 for assessments at Yr2 and Yr7)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short-Medium term (DP1 2020-2022 and DP2 2023-2026)
Location	Lake foreshores Zone 1, Zone 2, Zone 3, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Public safety assessment complete by June 2022.

Action 17: Greater acknowledgement of Aboriginal heritage

Desired Outcome	To identify culturally appropriate ways to better acknowledge the indigenous history of the lake surrounding habitats.
Priority ranking	High (9)
DESCRIPTION OF TASKS:	
1. Planning and design of potential options which may include dedicated signage, educational materials and field days to allow for appropriate acknowledgement. 2. Stakeholder engagement: consultation with the range of stakeholders identified during Stage 2 will be important to reflect the diversity of groups and agree on the best way forward. 3. Implementation. 4. Integrate with Action 22: Education campaign for promotion and dissemination of information.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, Jali LALC
Total Cost Estimate (10 yr)	$55,000 (Allowance of $40,000 for consultation, planning and concept design, $15,000 for implementation (e.g. signage, educational materials etc.)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short- term initial planning work (DP1 2020-2022) and ongoing implementation (DP1 - DP3 2020-2029)
Location	Lake and surrounds (all zones), CMA1 – Coastal Wetlands and Littoral Rainforests, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Planning and design and consultation complete by June 2022. • Implementation and education underway by June 2023.

Action 18: Encourage alternative transport to the lake

Desired Outcome	To reduce congestion, parking pressure and vehicle use, leading to lower carbon emissions/pollution and increased safety. It also encourages exercise and community connectivity with associated increased health benefits.
Priority ranking	Medium (16)
DESCRIPTION OF TASKS:	
1. Planning and design of potential options which may include provision of bike racks and mobility scooter parking, a peak time shuttle bus service through town to the lake (i.e. summer holidays, Easter and October long weekends) and improved connectivity of walking and cycling pathways to the lake. 2. Stakeholder engagement: community consultation to determine preferred options and likely uptake. 3. Implementation/construction. 4. Integrate with Action 22: Education campaign to raise awareness of these additional services and facilities and promote use.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries
Total Cost Estimate (10 yr)	$220,000 (staff time and allowance of $20,000 for implementation, $25,000/yr for peak time shuttle bus service)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Ongoing (DP1 - DP3 2020-2029)
Location	Lennox Head and Lake surrounds (Zone 1), CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Planning and design and consultation complete by June 2023. • Implementation and education underway by June 2024.

Action 19: Management of future parking arrangements

Desired Outcome	To evaluate the extent of parking issues following completion of Foreshore Improvement Works and assist in directing further management effort.
Priority ranking	High (6)
DESCRIPTION OF TASKS:	
1. Review results of car parking monitoring conducted as part of Action 24: Monitoring program 2. Based on monitoring results recommend additional parking management. 3. Planning and design of new parking arrangements as needed. 4. Consideration and approval by BSC Local Traffic committee. 5. Implementation.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries
Total Cost Estimate (10 yr)	Staff time
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short-Medium term (DP1 2020-2022 and DP2 2023-2026)
Location	Parking areas along Camp Drewe Road (Zone 2) and urban areas of Lennox Head, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Report on parking monitoring program results completed by June 2022.

Action 20: Traffic management Camp Drewe Road

Desired Outcome	To improve public safety and reduce likelihood of wildlife road kill on Camp Drewe Road.
Priority ranking	Medium (15)
DESCRIPTION OF TASKS:	
1. Review of appropriate treatments consistent with best practise to improve the road safety for Camp Drewe Road. 2. Liaise with RMS regarding suitable speed limits (recommend no higher than current 50km/hr limit). 3. Liaise with NSW Police to highlight the issue and ensure enforcement of speed limits (e.g. extra patrols).	
Lead Organisation	BSC
Support Organisation	RMS, NSW Police
Total Cost Estimate (10 yr)	$30,000 (staff time and allowance of $30,000 for road treatments)
Potential Funding Sources	RMS, BSC, NSW Coastal and Estuary Grants Program
Timing	Short-Medium term initial review and liaison work (DP1 2020-2022 and DP2 2023-2026) and ongoing (DP1-DP3 2020-2029)
Location	Camp Drewe Road (Zone 2), CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Review complete by June 2021.

Action 21: Manage dog access

Desired Outcome	Reduction in the number of dogs in the lake and foreshore areas, reducing the inputs of urine and faeces to the lake and reduced impacts on native wildlife at the lake.
Priority ranking	Medium (23)
DESCRIPTION OF TASKS:	
1. Review current dog access arrangements at the lake as documented in the *BSC Companion Animal Management Plan* (BSC, 2017) and consideration of the following: a. Continue to provide dog access north of the Lennox Head SLSC to Seven Mile Beach. b. Consider removal of the on leash area along the eastern side of the lake, making all lake foreshore areas and immediate surrounds 'dog free'. Access to Seven Mile Beach will be maintained at SLSC track only. 2. Depending on outcomes of review, provide additional signage and education as required. 3. Continue Ranger presence and enforcement in the area. 4. Encourage dog walkers who drive to Seven Mile Beach to access the off-leash area of beach via the horse track at the end of Camp Drewe Road (north of 4wd track) where parking is plentiful. Achieved through Action 22: Education campaign. 5. Continue to provide dog poo bag dispensers and waste bins at suitable access points to the off-leash area at Seven Mile Beach and other locations.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries
Total Cost Estimate (10 yr)	$10,000 (staff time and allowance of $10,000 for signage and bins/bags)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short-Medium term (DP1 2020-2022 and DP2 2023-2026) and ongoing (DP1-DP3 2020-2029)
Location	Lake foreshores Zone 1, Zone 2, Zone 3, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Review of *BSC Companion Animal Management Plan* (BSC, 2017) completed by June 2021.

4.1.8 Education

Action 22: Education campaign

Desired Outcome	To inform the community about the values of the lake and its unique ecosystem components and sensitivities to human impact. The overall aim is to foster a higher level of understanding, respect and stewardship, translating into positive changes in behaviour.
Priority ranking	Fundamental

DESCRIPTION OF TASKS:

1. Planning: develop a multi-faceted campaign to educate and promote understanding of the natural attributes of the lake, sensitivities and key issues and encouraging low-impact use/practices to protect the lake. Issues to be covered include:
   a. Education about fertiliser use/garden waste management/compost etc. for all catchment land managers and residents to the south of the lake.
   b. Sensitivity of lake ecosystems, need for protection etc.
   c. Groundwater/surface water interactions, emphasising the link between what is added to the surface of land (e.g. fertiliser, manure, herbicides, pesticides etc.) and what can be transported through groundwater flows to the lake.
   d. Types of fertiliser, application rates, timing with rainfall etc.
   e. Information on health risks of exposure to cyanobacteria blooms and revised signage.
   f. Sunscreen pollution:
      - Key risks of sunscreen to human health, water quality and wildlife.
      - Encourage use of more environmentally friendly sunscreen, wear UV resistant clothes instead (e.g. rash shirt etc.), avoid hottest part of day, apply sunscreen 20 minutes before swimming etc.
   g. Promote the key goals of the management zones described in Section 3 (including signage to mark the 'priority swimming areas').
   h. Impacts of dogs on native wildlife and water quality.
   i. Promotion of the horse track at the end of Camp Drewe Road (north of 4wd track) as a place to park and walk dogs on the leash-free beach. The aim is to reduce parking pressure around the lake.
   j. "No Camping/fires" signage along Camp Drewe Road to deter illegal camping and camp fires in bushland.
   k. Pest fish species education - an educative program coupled with facilities for accepting unwanted aquarium fish. Information could include relevant pest species identification information, impacts of aquarium fish releases to the wild, dumping of aquarium fish is prohibited and alternatives to dumping aquarium fish.
   l. Native wildlife present in the area, habitat values and key risks including discussion of what the community and visitors can do to conserve wildlife (i.e. Camp Drewe Road wildlife crossing).
   m. Results of components.
   n. Outcomes of Action 17: Greater acknowledgement of Aboriginal heritage.
   o. Educational programs should target the local community as well as visitors to the area and may involve:
      - Installation of attractive and engaging signage at key locations around the lake (which may replace existing signage).
      - Leaflets/flyers/letterbox drop.
      - Webpage.
      - Social media posts and promotion.
      - Posters.
      - Information days/activities.
      - School programs.
      - Educational videos.
2. Consultation with local community groups (e.g. Lennox Landcare, Wildlife Watchers etc.) during design of the

program will assist in developing appropriate and relevant information/methods and draw on community educational knowledge and resources. 3. Implement program. Review program on an annual basis. 4.	
Lead Organisation	BSC
Support Organisation(s)	EES – Coast and Estuaries, North East Waste, Beachwatch, WaterNSW, The Lennox Wave magazine, Lennox Head Landcare
Total Cost Estimate (10 yr)	$140,000 (Staff time and allowance of $30,000 for design of campaign, $20,000 for signage and materials, $10,000/yr ongoing implementation)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short- term initial planning work (DP1 2020-2022) and ongoing implementation (DP1 - DP3 2020-2029)
Location	n/a
Performance Targets	• Planning and design and complete by June 2021. • Implementation and education underway by September 2021.

Action 23: Review blue green algae alert/lake closure signage

Desired Outcome	Better communication of risks associated with algal blooms with a view to reducing swimmers during high risk periods.
Priority ranking	Medium (22)
DESCRIPTION OF TASKS:	
1. Review the current signage including text, images, symbols as well as placement and sizing to ensure effective communication of public health risks. 2. Recommend improvements to signage to more effectively communicate public health risks associated with blue green algae blooms as well as complementary actions to promote and educate about the risks of blooms. 3. Implement – create new signage and deploy at most effective locations. Promote and educate through Action 22: Education campaign.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, WaterNSW, NSW Health
Total Cost Estimate (10 yr)	$5,000 (staff time and $5,000 allowance for new signage)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program
Timing	Short- term (DP1 2020-2022)
Location	Lake swimming locations, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Review complete by August 2020. • Implementation new signage by November 2020.

4.1.9 Monitoring

Action 24: Monitoring program

Desired Outcome(s)	To track performance of actions implemented as part of the CMP and allow for timely maintenance and adaptive management measures to be implemented as required. To better understand the level of issues and priority for management.
Priority ranking	Fundamental
DESCRIPTION OF TASKS:	

1. Planning: develop a multi-discipline monitoring program to provide better information and inform effective management. Components for inclusion are:
   a. Water quality – ongoing monitoring of water quality to allow for assessment of changes as a result of management actions. This task involves an initial review of current/past monitoring program and documentation of an ongoing water quality monitoring plan.
   b. Blue green algae - continuation of current monitoring in line with National Health and Medical Research Council guidelines (NHMRC, 2008) and existing BSC processes.
   c. Automatic water level and water quality - continuation of current monitoring via the automatic water level and water quality recorder managed by MHL on behalf of EES – Coast and Estuaries. Addition of dissolved oxygen and pH probes to the automatic recorder to allow for real-time monitoring of these aquatic health indicators (particularly important with regard to proposed changes to the aerator program).
   d. Sediment extent - it is proposed that the extent of the organic rich mud sediment be assessed every 5 years by repeating the methodology implemented as part of Stage 2 of the CMP. This will provide information about relative rates of sedimentation over time. If reductions in algal blooms are achieved through other management actions, monitoring sediment extent will allow for an assessment of whether reduced algal blooms reduces the rate of sedimentation.
   e. Hydrology and groundwater – conduct groundwater monitoring in the catchment to replicate that undertaken as part of the 1996 Estuary Processes Study and allow for assessment of current groundwater conditions and more accurate modelling of groundwater outflows and lake water balance completed as part of Stage 2 of the CMP development.
   f. Erosion - monitor the performance of the lake foreshore erosion controls and conduct timely maintenance as required. Formal assessment by repeating the Erosion Assessment conducted as part of Stage 2 studies is recommended annually. The current Foreshore Improvement Works along the southern and eastern foreshores of the lake include formalised pedestrian pathways and wheelchair accessible ramps to the water, coupled with bank erosion amelioration works. It will be necessary to monitor the new access points created to ensure access is functioning as intended, and if necessary trigger maintenance or further work as required. There is also a need to monitor future access pressure on the western side following closure of the eastern road to minimise/mitigate any worsening of erosion.
   g. Riparian vegetation - Formal assessment by repeating the Riparian Condition Assessment conducted as part of Stage 2 studies is recommended annually, recommendations to inform riparian restoration works.
   h. Investigations of sunscreen pollution – design a monitoring program to provide further information on the nature of sunscreen pollution and potential impacts on ecology and particularly nutrient concentrations. Monitoring could involve testing lake water for chemicals of concern, assessing the nutrient composition of common sunscreens and/or physical assessment of sunscreen slicks on the lake surface.
   i. Investigate sources of Enterococci (faecal contamination) - determine whether wildlife/dogs or human waste is the source of faecal matter to the lake. This investigation is currently underway at the lake. Results will determine whether follow up monitoring is needed.
   j. Increasing use of the western side – monitor visitor numbers, access points and subsequent impacts on bank erosion, vegetation, ecosystem values, cultural heritage and amenity (Action 15: Monitor and manage increasing use of the western side of the lake). It is recommended that monitoring be conducted over one year to capture seasonal variation. Results will be used to assist in developing concept design for the western foreshore.

k. Parking - monitor car parking patterns following the closure of the eastern road with a focus on assessing parking along Camp Drewe Road and into suburban areas of Lennox Head and subsequent impacts on environmental values, amenity and public safety. Also track the effectiveness of and dog walker use of beach access at the end of Camp Drewe Road. It is recommended that monitoring is conducted over a year to capture seasonal changes in demand. The information will assist in evaluating the extent of the problem and potential further management options for the western side. l. Assessment of wildlife populations and impact of Camp Drewe Road – This will involve monitoring of all wildlife road fatalities/injuries along Camp Drewe Road with a particular focus on turtles. A register of community sightings should also be established and advertised to encourage community members to share information. Details to be captured include species name/common name, approximate age (e.g. juvenile/adult), date of observation, observation type (e.g. fatality, injury) location (GPS coordinates if possible), photograph, and details of outcome (e.g. transported to vet/ wildlife carer in the case of injury, or disposal in the case of fatality). The location of turtle nesting sites and crossing locations should be determined to assist in placement of any future traffic control structures and signage (Action 13: Wildlife/turtle crossing warning signs on Camp Drewe Road). It would be ideal to monitor over 1 year to capture seasonal changes, and may potentially be a suitable post-graduate student study. 2. Implement monitoring program 3. Review results of program on an annual basis.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, Southern Cross University
Total Cost Estimate (10 yr)	$343,000 (Total allowance of $73,000 for program design and equipment, $270,000 ongoing implementation across all components over 10 years)
Potential Funding Sources	BSC, NSW Coastal and Estuary Grants Program, Southern Cross University
Timing	Initial design short-term (DP1 2020-2022) ongoing implementation (DP1 - DP3 2020-2029)
Location	All zones, CMA1 – Coastal Wetlands and Littoral Rainforests, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Planning and design and complete by June 2021. • Implementation underway by September 2021.

4.1.10 Management and governance

Action 25: Establish an integrated management group

Desired Outcome	To ensure coordinated and cooperative management for ongoing and effective management of the lake.
Priority ranking	Fundamental
DESCRIPTION OF TASKS:	
1. Formalise roles of the existing Lake Ainsworth CMP Steering Committee to oversee CMP implementation and review. This includes appointment of the following key roles: a. Chairperson to chair meetings. b. Secretary to organise and host meetings and distribute minutes and oversee group administration. 2. As a minimum, meetings should be held twice a year, and more frequently as required to discuss implementation milestones, funding and emerging issues etc.	
Lead Organisation	BSC
Support Organisation(s)	EES – Coast and Estuaries, NSW Office of Sport, NSW Crown Holiday Parks Land Managers, DPIE - Crown Lands, Lennox Head SLSC, Jali LALC, local Aboriginal representatives, representatives of local community groups as relevant.
Total Cost Estimate (10 yr)	Staff time
Potential Funding Sources	n/a
Timing	Ongoing (DP1 –DP3 2020-2029)
Location	n/a
Performance Targets	• Membership of management group and roles appointed by September 2020. • Meetings held twice a year.

4.1.11 Performance monitoring and review of actions

Action 26: Review of CMP progress and monitoring of performance targets

Desired Outcome	Continuous improvement towards the CMP objectives across the full range of issues.
Priority ranking	Fundamental
DESCRIPTION OF TASKS:	
Documentation of the effectiveness of the proposed actions will be reported as part of Council's State of the Environment (SoE) Reporting and IP&R framework including progress towards the performance targets included for each action.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, DPI Fisheries, DPIE - Crown Lands, North Coast LLS
Total Cost Estimate (10 year)	Included in existing Council reporting
Potential Funding Sources	n/a
Timing	Annually (IP&R reporting); every three years (SoE reporting)
Location	Lake Ainsworth
Performance Targets	• IP&R reporting annually • SoE reporting every three years

Action 27: Ten year review of CMP

Desired Outcome	Management actions and approaches remain appropriate for the long term.
Priority ranking	Fundamental
DESCRIPTION OF TASKS:	
The CMP and the specified management actions should be reviewed to ensure they are being achieved and are resulting in the desired outcomes. A ten year review (or earlier if warranted by legislative or management changes or improved scientific understanding) of the CMP is required to consider: • Results of the SoE Reporting. • Results of IP&R Reporting. • Review of status of CMP actions including overall success and any barriers to the effective implementation. • Any new or updated scientific knowledge. • Data provided by Action 24: Monitoring program. • Prevailing community attitudes, government policy and strategic planning status.	
Lead Organisation	BSC
Support Organisation	EES – Coast and Estuaries, DPI Fisheries, DPIE - Crown Lands, North Coast LLS
Total Cost Estimate (10 year)	$50,000 (Allowance of $50,000 for review at Yr10)
Potential Funding Sources	EES – Coast and Estuaries Estuary Management Program, BSC
Timing	Long term (Yr10, DP3 2027-2029)
Location	Lake Ainsworth
Performance Targets	• Review and reporting undertaken by June 2030. • Adoption and gazettal of the amended CMP as required.

4.2 Actions to be undertaken by public authorities

4.2.1 Flooding

Action 5: Flood planning - NSW Office of Sport

Desired Outcome	Ensure all development or management option in the study area is suitable for the location and/or is adaptive to changing flooding risk.
Priority ranking	Medium (12)
DESCRIPTION OF TASKS:	
1. Future development in the catchment and all actions implemented as part of this CMP will need to consider the potential future flood risk. 2. Emergency management plans for Lake Ainsworth Sport and Recreation Centre should be updated with future flooding risk and contingencies for the potential closure of Camp Drewe Road due to flooding.	
Lead Organisation	NSW Office of Sport
Support Organisation	BSC,EES – Coast and Estuaries
Total Cost Estimate (10 yr)	Staff time
Potential Funding Sources	n/a
Timing	Short- term (DP1 2020-2022)
Location	Flood risk areas identified in *Stage 2 Vulnerabilities and Opportunities Study* (Hydrosphere Consulting, 2019a), CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Emergency management plans for Lake Ainsworth Sport and Recreation Centre updated by June 2021.

4.2.2 Flora and fauna

Action 28: Biological control of Salvinia

Desired Outcome	To provide ongoing control of Salvinia in the lake.
Priority ranking	Medium (19)
DESCRIPTION OF TASKS:	
1. DPI to continue biological control of Salvinia at the lake. 2. Review results of program on an annual basis.	
Lead Organisation	DPI
Support Organisation	BSC, EES – Coast and Estuaries
Total Cost Estimate (10 yr)	No additional costs
Potential Funding Sources	n/a
Timing	On-going (DP1 - DP3 2020-2029)
Location	In-lake, CMA 3 – Coastal Environment Area, CMA 4 – Coastal Use Area
Performance Targets	• Annual implementation.

5. BUSINESS PLAN

The business plan outlines the key components of the funding strategy for the CMP, including the cost of the proposed actions, proposed cost-sharing arrangements and other potential funding mechanisms.

The intent of implementation of this CMP is in meeting the objectives developed for the environmental, social, recreational and commercial values of the lake as identified in Section 1.2.1. This Business Plan (summarised in Table 6) specifies:

- Action ID number and name.
- Cost estimate.
- Timing.
- Cost benefit distribution – A key driver in meeting these objectives is the protection and improvement of lake health bringing about subsequent public benefits (e.g. through improved recreational potential and amenity) or vice-versa. None of the recommended actions aim to benefit private interests although they may do so indirectly as a consequence of improved lake health (e.g. to commercial businesses in the nearby area including tourism operators and food and beverage outlets). No cost-sharing with private parties has been proposed.
- Economic analysis and funding category – three categories are provided as follows:
    - Category 1 – economic analysis complete, action funded under normal operating budget or existing programs and grants and not expected to impact on current resourcing levels.
    - Category 2 – economic analysis complete, action subject to funding.
    - Category 3 – no economic analysis, action subject to detailed costing, economic analysis and funding.

5.1 Funding and resources

The CMP actions are expected to be funded through BSC and state government contributions, monetary grants and volunteer works by community members and organisations.

Some actions are funded under Council's normal operating budgets throughout the ten year period, or through existing programs and grants, particularly within Delivery Program 1 (up until 2023). Where actions require Council staff resources, actual costs have only been applied where it is expected that implementation will exceed current resourcing levels, in which case, additional funding is required.

Council operates an annual budget primarily through rates and charges (e.g. water, sewer and waste) as well as fees, investment revenues, loans, property management and operating grants. It will not be possible for BSC to implement all actions identified in this CMP without additional sources of funding. As such, identification of grants and the submission of successful funding applications is an important component of this CMP. A list of current possible sources of external federal, state and local funding is provided below. However, it is important to note that many grants and funding sources change year to year, are only available up to a limited budget, or require significant co-funding commitment. It is also important to note that accurate estimates of project costs, particularly for on ground works cannot be developed until survey and design tasks have been completed, with these tasks often incurring significant costs. It will be necessary to keep abreast of current funding availability throughout the implementation of the CMP and take advantage of funding opportunities as they arise. In each case, the precise amount of funding available will not be known until it has been awarded.

Agencies responsible for delivery of actions in this CMP have been consulted during the development of the CMP and have indicated support for the actions. However, delivery of the actions will depend on the

availability of funding which is yet to be confirmed. Despite the priority of each action listed in the CMP, the timeframe of implementation will be influenced by the availability of resources and funding.

Certification of this CMP will facilitate eligibility for funding of key actions through the NSW Coastal and Estuary Grants Program. Actions will be prioritised for future applications for external funding with matching contributions from the budgets of relevant Council programs.

Key sources of funding identified for the CMP actions are:

- BSC funds - generated through rates, fees and charges, investment revenues, loans, property management and operating grants.
- NSW Coastal and Estuary Grants Program – provided by the NSW Government and administered by EES – Coast and Estuaries to support local government work to improve the health of NSW coasts and estuaries under several streams:
    - Planning stream – for planning and studies including investigation, design and cost-benefit analyses for infrastructure works recommended in a certified CMP. The funding round for the planning stream is open for 10 months from August-June each year.
    - Implementation stream for each of the four CMAs with priority given to projects that reduce risk from coastal hazards and projects that enhance environmental resilience and the natural environment. Examples projects include but are not limited to:
        - Weed management, vegetation rehabilitation, signage and education programs in coastal wetland and littoral rainforest areas (CMA 1);
        - Design and implementation of erosion reduction structures and beach nourishment works in coastal vulnerability areas (CMA 2);
        - Ecosystem health monitoring, community education, stormwater management, revegetation, protection of Aboriginal heritage and riparian corridor management in coastal environment/coastal use areas (CMA 3 and CMA 4).

      The funding round for the implementation stream is open for one month (August-September) each year.
- Increasing Resilience to Climate Change program – a partnership program between Local Government NSW (LGNSW) and EES – Coast and Estuaries to encourage:
    - Implementation of actions to address identified climate risks.
    - Regional consideration of climate change impacts in decision making.
    - Implementation of climate change adaptation actions beyond business-as-usual projects and programs.
    - Enhanced adaptive capacity.
- DPIE – Crown Lands:
    - Crown Reserves Improvement Fund Program for development and maintenance projects and to improve land and facilities on Crown land. Funding under this program is subject to a competitive grant application process and eligibility requirements which may change from year to year and in accordance with departmental priorities.
- The NSW Environment Trust – administered by EES – Coast and Estuaries to fund a broad range of projects which enhance the environment of NSW. Relevant streams include environmental education, protecting our places (for the sharing and protection of Aboriginal Cultural knowledge and the protection, restoration and enhancement of culturally significant Aboriginal Land), research, restoration and rehabilitation projects and waste avoidance and resource recovery.

- NSW EPA Waste Less, Recycle More initiative - a set of programs including "Council Litter Prevention Grants", managed by the NSW Environment Protection Authority and NSW Environmental Trust. The initiative includes programs for local government, business, industry and the community. Relevant examples of recent grants awarded under the program include "Butt-free Byron Shire" a program aimed at changing littering behaviour through collaborative community engagement, education and enforcement with a focus on cigarette butts (Byron Shire, $100,000). The NSW Government has allocated $802 million over 9 years for Waste Less, Recycle More. The initiative will run until 2020–2021.
- Commonwealth Community Led Grants - Indigenous Advancement Strategy grant funding for Aboriginal people and communities to devise strategies that will support their community and the people living in it and to carry out projects that address an emerging need or opportunity.
- Human resources and in-kind contributions are also, or may be required from:
    - BSC,
    - DPIE – Crown Lands,
    - EES – Coast and Estuaries,
    - NSW Office of Sport,
    - Crown Holiday Parks Land Manager,
    - Lennox Head SLSC,
    - DPI - Fisheries,
    - North East Waste,
    - RMS,
    - NSW Police,
    - North Coast LLS,
    - Jali LALC,
    - Lennox Head Landcare,
    - Other volunteer and community groups,
    - Educational and research institutions.

Where actions are being sufficiently implemented through an ongoing concurrent program, additional expenditure and funding have not been included.

8.10 Coastal Management Program - Lake Ainsworth Lennox Head.DOC

Table 6: Business Plan

No.	Action/Year	Priority Ranking	Total 10 yr cost	Total 10 yr capital cost	Total 10 yr operational cost	DP1 (2020-2022)			DP2 (2023-2026)				DP3 (2027-2029)			Cost benefit distribution (private vs. Public)	Business Plan Category
						Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10		
			$'000	$'000	$'000	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029		
Water quality																	
1	Trial modifications to artificial aeration	High	110		110	60	50									100% public	2
Sediment Management																	
2	Trial sediment treatment	High	220		220			40	170	10						100% public	2
Bank Erosion																	
3	Beach nourishment	High	260	250	10		50	200			5			5		100% public	2
4	Riparian vegetation enhancement for erosion control	High	65	20	45		25	5	5	5	5	5	5	5	5	100% public	2
Catchment Management																	
5	Stormwater treatment improvement	Medium	40		40					20					20	100% public	2
6	Litter management/ recycling	High	50		50	5	5	5	5	5	5	5	5	5	5	100% public	2
Flooding																	
7	Flood planning	Medium				no additional cost										100% public	1
Flora and Fauna																	
8	Local cane toad management strategy	Medium	55		55			20	5	5	5	5	5	5	5	100% public	2
9	Riparian vegetation management	Medium	110	30	80		30	10	10	10	10	10	10	10	10	100% public	2
10	Backfill exposed tree roots	High	56	50	6	50		2			2			2		100% public	2
11	Aquatic weed harvesting	Medium	10		10	1	1	1	1	1	1	1	1	1	1	100% public	2
12	Grass species selection and instal	Medium	85	85						85						100% public	1&2
13	Wildlife/ turtle crossing warning signs on Camp Drewe Road	Medium	10	5	5	5				5						100% public	2
14	Replace boom	Medium	10	10		10										100% public	1
Community Uses																	
15	Monitor and manage western side of the lake	High	300	300			100	200								100% public	2
16	Review of public safety risk assessment	High	10		10		5					5				100% public	2
17	Greater acknowledgement of Aboriginal Heritage	High	55	15	40		40	15								100% public	2
18	Encourage alternative transport to the lake	Medium	220	20	200			45	25	25	25	25	25	25	25	100% public	2
19	Management of future parking arrangements	High				no additional cost										100% public	1
20	Traffic management Camp Drewe Road	Medium	30	30		30										100% public	2
21	Manage dog access	Medium	10	10			10									100% public	2
Education																	
22	Education campaign	Fundamental	140	20	120	30	30	10	10	10	10	10	10	10	10	100% public	2
23	Review blue green algae alert/ lake closure signage	Medium	5	5		5										100% public	2
Monitoring																	
25	Monitoring program	Fundamental	343	73	270	58	100	35	25	30	20	15	25	20	15	100% public	1&2
Management and Governance																	
24	Establish an integrated management group	Fundamental				no additional cost										100% public	1
Performance Monitoring and Review of Actions																	
26	Review of CMP progress	Fundamental				no additional cost										100% public	1
27	10 year review of CMP	Fundamental	50		50										50	100% public	2
Actions to by Other Public Authorities																	
28	Biological control of Salvinia	Medium				no additional cost										100% public	1
TOTALS			2244	923	1321	254	446	588	256	211	88	81	86	88	146		

Notes. 1 Years correspond to end of financial year i.e. 2020 is Year 1 (start 1st July 2020, end 30th June 2021) etc.

2 Timing is dependent on Ministers approval of CMP and approval of funding where applicable

3 Shaded cells are actions with no additional costs allocated as part of this CMP.

4 Business Plan Categories:

Category 1 – economic analysis complete, action funded under normal operating budget or existing programs and grants and not expected to impact on current resourcing levels.

Category 2 – economic analysis complete, not currently subject to funding.

Category 3 – no economic analysis, action subject to detailed costing, economic analysis and funding.