



Review of the Belongil EOS (Alluvium 2019) – Review of the Belongil Estuary Study Management Plan (2001)

Review Items	Discussion and Context	Response
<p>Review of the previous Belongil Estuary Study and Management Plan (2001)</p>	<p>The Belongil Estuary Study Management Plan (2001) was commissioned by Council and the State government. The Plan adopted two major changes at the time: lower the artificial opening height from 1.2 metres to 1.0 metre AHD, primarily to reduce the risk of fish kills and stabilise the fish kill situation, and secondly make progress on addressing the major pollution impacts of acid sulfate soils (ASS) and other lesser pollution.</p> <p><i>"Some of the dangers in lowering the opening height were obvious: potential changes in the ecology over time, possibly a lower impetus to reduce Byron Bay's overall flood risk, and my own biggest fear was that development would creep downwards, making future remediation more difficult" (Pont, 2020).</i></p> <p>It was always envisaged under the Estuary Management Plan that the removal or control of artificial drains would proceed in conjunction with the estuary opening regime (draft EOS, 2005).</p> <p>A review of the Belongil Estuary Study and Management Plan (BESMP) (Parker and Pont, 2001) was undertaken as part of the Scoping Study for the Southern Shire Coastline including Tallow and Belongil Estuary (Rhelm, 2021). A summary of the status of strategy/action implementation is provided in Table 5-2 of the Scoping Study with a full review provided in Appendix F.</p> <p>46 actions were outlined in the BESMP of varying importance/priority to implement. The review outlined the current status of implementation of each action (to the best knowledge of staff/consultant input) - some were 'incomplete'; some 'partially complete', some 'not commenced', some 'in progress', some 'unknown' and some 'complete'.</p> <p>Actions 29 to 32 of the BESMP are recommended under the heading "Entrance management and flooding of Byron township" and include:</p> <ul style="list-style-type: none"> - #29 The estuary mouth is to be kept open continuously at the interim benchmark level of 1.0m AHD in conjunction with monitoring water quality parameters. Comments in the Scoping Study review - N/A - Operates as an intermittent closed and open lake or lagoon (ICOLL) system. Licenced to open creek entrance when 1.1m at Ewingsdale Bridge <i>{this is an error. See note below}</i>. Licence valid until 2022. Council operate the estuary in accordance with the Belongil Creek Entrance Opening Strategy (EOS) (Alluvium, 2019b). The EOS specifies ongoing and event-based water quality monitoring requirements. Council reports on a six-monthly basis. <p>[Note: Crown Lands Licence (expires Dec 2022) - Condition #55 allows Council to artificially open the creek when the water level reaches or exceeds 1.0m AHD rather than 1.1m AHD as stated above. The EOS provides an alert/watch level of 1.0m AHD and an immediate breach level at 1.1m AHD however there is some flexibility within the framework when the estuary level is between 1.0 – 1.1 m AHD and ocean levels are not impacting on estuary levels.]</p> <ul style="list-style-type: none"> - #30 - Conduct further investigation into upper catchment remediation works (e.g. trial drop-boards) in conjunction with an estuary opening strategy. Comments in the Scoping Study review - PARTIALLY COMPLETE - EOS adopted in 2020. EOS (Alluvium, 2019b) included preliminary consideration into the creation of weirs to decouple the catchment from the estuary. The EOS identified considerable uncertainties from this option which would require further investigation into the appropriate locations and type of water control structures required [and in fact, the preferred remediation and management strategy for ASS in general]. - #31 - Continue to liaise with DLWC regarding a Part 5 application for estuary opening. Comments in the Scoping Study review - COMPLETE - Belongil Creek Entrance Opening Strategy - Review of Environmental Factors (Integrated Ecosystem Research & Management, 2005). - #32 - Monitor the protocol for entrance opening including: water quality, width of estuary and time and date of opening <p>Comments in the Scoping Study review - ONGOING -Council undertakes monitoring 1 day before opening and 6 days after opening as well as monthly</p>	<p>The BESMP is outdated, however was a key document for the which the status of recommended actions was reviewed in preparation of the current EOS and the Scoping Study for the Southern Shire Coastline. Whilst consideration of the remaining actions from the BESMP will be considered in developing a CMP, the subsequent CMP for Belongil Creek will make this plan completely redundant.</p>



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	<p>monitoring of a suite of phys-chem parameters and continual water level monitoring. Monitoring since 2002. Council reports on a six-monthly basis.</p> <p>There are also numerous other actions related to water quality, acid sulfate soils, riparian management, wetland management etc that are not reviewed here.</p>	
<p>Similarities and/or differences between the current EOS (2019) and the previous Belongil Estuary Management Plan (2001)</p>	<p>The EOS (2019) seeks to "<i>develop a long term sustainable Opening Strategy which minimises the impacts on natural littoral processes and the fragile ecosystems which exist within the Belongil Creek catchment, while also protecting the community and existing built assets from flooding</i>". The main differences between the approach in 2001 outlined in the BESMP and the current approach in the 2019 EOS insofar as they relate to entrance management activities appears to be the level of water at Ewingsdale Bridge that instigates an opening. The 2001 approach outlines that the estuary should be "kept open continuously at the 1.0m AHD in conjunction with monitoring WQ parameters".</p> <p>This 2001 strategy proposed opening the entrance as soon as WLs get to 1.0m AHD which is soon after the entrance closes. The approach is based on the below factors:</p> <ul style="list-style-type: none"> - potential ecological implications - avoidance of prolonged inundation of ecosystems (mangroves and saltmarsh) at higher WLs (inundation of subtidal communities for too long and inundation of shorebird habitat) - accumulation of poor water in the estuary. <p>The intention appears to have been to have more or less a permanent open and flowing creek to the ocean. It was proposed that in the short-term Council should continue opening the estuary at 1.0m AHD to avoid rapid flush out events which were believed to increase the risk of fish kills. The BESMP also mentions keeping the estuary continuously open due to water quality from stormwater. The Crown Lands Licence was based on the BESMP and allows opening of the creek when water level reaches or exceeds 1.0m AHD, <u>subject to Council working towards a long-term opening strategy</u>. In 2018, Council engaged Alluvium as the successful consultant to prepare a long-term Entrance Opening Strategy for Belongil Creek, which included a:</p> <ul style="list-style-type: none"> - comprehensive understanding of the system, conditions and processes; and - assessment of different options for the management of the estuary to determine the optimal management arrangements. <p>The EOS was completed in 2019 and adopted by Council in February 2020. The adopted EOS is not too different to the previous approach as it still centres around a 'watch' level of 1.0m and 'immediate' breach level of 1.1m AHD. However, it does include the consideration of berm levels/scraping and other parameters such as ocean levels, and weather conditions (rainfall and waves). In the current EOS there is not a necessity to open the creek at the 1.0m AHD if no rainfall is coming. There is flexibility within the range of 1.0m to 1.1m AHD. Note: <i>Maintaining water levels below 1.0m AHD in the present day is becoming difficult given actual sea level rise that has occurred in the twenty years since the 2001 BESMP.</i></p>	<p>The current approach includes the consideration of berm levels/scraping and other parameters such as ocean levels, and weather conditions (rainfall and waves). In the current EOS there is not a necessity to open the creek at the 1.0m AHD if no rainfall is coming. There is flexibility within the range of 1.0m to 1.1m AHD.</p>
<p>Performance of the current EOS (2019) and the previous Belongil Estuary Study and Management Plan (2001)</p>	<p>There is an assertion that the past Belongil Estuary Study and Management Plan written by Peter Parker and David Pont in 2001, and which the interim Crown Lands Licence to open the creek is based, is better (or performs better) than the current EOS. ICOLLs are predominately 'closed' and should remain so, only opened when warranted. Best practice is to have minimal intervention and remediate catchment issues and inputs. The NSW Government has general initiatives for reducing the reliance on artificially opening ICOLL entrances as a means for surrogate land management. It is important for the EOS to balance the needs of various priority coastal and catchment values whilst also remaining adaptable, cognisant with the expected impacts of climate change and sea level rise. 'Performance' of the current EOS is subjective depending on the stakeholder and their interest and how the 'performance' is being measured.</p> <p>This preliminary review of the EOS considered some of the key ICOLL themes and review items and forms part of the full technical review. Any changes over the previous 2 years (positive or negative) since implementation of the EOS may be acknowledged or identified though it is noted the system is highly complex and understanding changes is extremely difficult.</p>	<p>This review of the EOS considered some of the key ICOLL themes and review items and forms part of the full technical review.</p>