

Poona Boat Ramp Feasibility Study

A joint feasibility study

by the

Department of Transport and Main Roads (TMR)

and

Fraser Coast Regional Council (FCRC)

Document control sheet

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Executive summary

This study examines the feasibility of establishing an improved tidal access boat ramp in the Poona region. The study was undertaken by the Boating Infrastructure Unit within the Department of Transport and Main Roads (TMR) in collaboration with Fraser Coast Regional Council (FCRC). Should the feasibility concept progress beyond this study, TMR would be responsible for the ramp construction, and FCRC responsible for the construction of the car-trailer park and thereafter the management of the facility.

TMR and FCRC agreed with the local community to undertake this feasibility study to determine the significant technical, environmental and financial implications of constructing and maintaining a new Poona boat launching facility, and whether there would be sufficient benefits to warrant progressing the concept forward for funding consideration and potential implementation as a works project. The area is within the Great Sandy Marine Park, therefore there are several restrictions on allowable activities as well as on the construction of new tidal works.

The existing single-lane Poona boat ramp was built in 1989 to meet the recreational boating demand of the Poona community.

In regional terms, demand pressures have steadily increased over time, resulting in a regional shortfall of lanes in the FCRC local government area. Further to this, the *Recreational Boating Facilities Demand Forecasting Study 2017* (GHD, 2017) identified Poona as a 'Priority 1' recommendation. This was a high-level demand forecasting study, which considered only the basic factors and demographics. If FCRC confirms its support for this project, the concept plans would be submitted to TMR for more detailed assessment against broader criteria as outlined below.

A primary objective of the feasibility study was to identify site constraints for a proposed new boat launching facility in Poona Creek and evaluate measures to overcome these constraints. The concept designs produced have considered the site constraints and include some design elements to address them. Not all constraints were able to be eliminated or significantly reduced. For instance, the proposed ramp site sits at the base of a steep vegetated slope. The difference in elevation from top of the slope to the bottom is about 7-8 m. Neighbouring sections of the slope are near vertical, and actively eroding. A geotechnical investigation was undertaken at the boat ramp and car-trailer park proposed areas to further determine the risks of building public infrastructure at this site, however further consideration will need to be given to locating the proposed car park as far landward as possible to provide a greater buffer than the conceptual layout design and reduce the risk of requiring erosion protection.

Two concept options for the boat ramp design were investigated initially, with a third option developed due to FCRC's car-trailer park location criteria. The three options are presented in Appendices B and C.

Option 3 consists of a two-lane ramp and takes advantage of an area of cleared vegetation at the top of the slope where FCRC's car-trailer park could potentially be constructed. The alternate options were considered unsuitable due to the dense undisturbed vegetation that would require clearing. The ramp alignment for Option 3 was modified to suit the preferred car-trailer park location, and to reduce the amount of fill required by realigning the turnaround area. Two lanes would be required to facilitate safe access and manoeuvrability for this option, even though the demand only requires one lane. Therefore, the usual requirement of 22.5 CTU parks per lane (45 CTU parks) will not be necessary.

The current ramp, located on Owen Cox Street, does not provide access at lower tides. This is due to the tidal regime, expanse of sand flats and moving shoals within Great Sandy Strait (GSS). The proposed boat ramp in Poona Creek would offer an estimated increase in accessibility of 4-5 hours per tide during spring tides, corresponding to a 36% increase in available water depths. During neap tides, it is likely that the proposed ramp would always be accessible. Although vessels may be able to launch at the ramp into appropriate water depths, that does not guarantee that they will always be able to navigate the channels leading to deeper water in the GSS. This is due to natural shoals and sandbanks within GSS and the creek mouth causing tidal restrictions and being subject to future natural changes. Advice from the Department of Environment and Science (DES) indicates that even if a Marine Parks

Permit is issued for a new boat ramp, any future dredging for accessibility purposes in the approaches to the ramp would not be supported. This is consistent with TMR state-wide policy.

The proposed location is culturally significant to the Butchulla People. Any future works would involve further consultation and heritage assessments. If the boat ramp concept should progress to become a works project, interpretative signage or other cultural acknowledgement relating to Butchulla traditional ownership, cultural practices, history and language of the general area may require installation.

In terms of environmental implications, a suite of environmental studies and statutory approvals would be required to progress, as presented in the Environmental Approvals and Permits Summary (Table 2). These include a flora study to identify any protected or endangered plant species and a field study to identify the presence of breeding habitat. Approvals may take up to a year from finalisation of a detailed design.

Tenure of three separate lots of land needs to be considered if the concept progresses further. Most of the boat ramp footprint is located within seabed classified as unallocated state land and will require owners consent from Department of Natural Resources and Mines and Energy (DNRME). Generally, TMR has been able to construct facilities on seabed with unallocated state land tenure and this is expected to be the case for the proposed ramp location. However, land tenure would need to be changed for the proposed car-trailer park construction to proceed. Advice from DNRME on this matter is discussed in more detail in this study.

Costs for the proposed boat ramp construction and car-trailer park/intersection upgrade have been estimated based on the concept designs. These are \$2,010,000 and \$1,220,000 (excluding GST) respectively and includes a 40% contingency allowance. This equates to a total estimated project cost of \$3.23 million. Funding would be required from both TMR and FCRC for the proposed facility to progress and there is a risk of additional capital expenditure being identified through the detailed design process and/or as conditions imposed on statutory approvals, such as mitigating environmental impacts in terms of water quality, drainage and discharge works. As the future Facility Manager, FCRC will also need to consider the ongoing operational costs, such as facility maintenance, inspections, cleaning and costs associated with provision of an amenities block (if required) e.g. water and electricity costs.

When making assessments and prioritising investments, TMR considers:

- community consultation
- proposals from local members on behalf of constituents
- the recommendations of the most recent demand forecasting study
- feasibility and constraints (eg foreshore profile, depths in access channels, wave climate, current scouring, siltation, protected areas such as marine parks and declared Fish Habitat Areas, environmental offsets, mangrove clearing, etc)
- available departmental funding (capital and grant) for in-water project components
- maximising benefit to maximum numbers of the boating public
- agreement from local government partners willing to commit funding for landside components based on their budget priorities and works programs
- foreshore land availability and access
- council project proposals
- state-wide equity considerations and demographic challenges for remote and sparsely populated areas
- a multi-criteria analysis to assist with relative state-wide project priority.

Successful projects are included in TMR's multi-year rolling works program. Most projects are scheduled over two to three years with design and environmental / development approvals undertaken in the first year and construction in a second year. Prioritisation of funding, technical constraints and local conditions such as severe weather can result in projects being staged over longer timeframes.

The results of this study will be tabled at a FCRC Council Meeting for further consideration. If supported to proceed, the project will be included on Council's forward works list for Council-wide prioritisation as part of capital works budget deliberations. It is also expected that FCRC will request the Queensland Government (through TMR) to align funds for design, approval and construction of the in-water components.

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1 Introduction

This joint study examines the feasibility of establishing an improved tidal access boat ramp at Poona. FCRC officers and TMR's Boating Infrastructure Unit (BIU) officers conducted the joint study. As a result of initial site and desktop investigations, a field investigation was undertaken with the assistance of Traditional Owners.

2 Background

The Poona township is serviced by a single-lane tide restricted boat ramp at Owen Cox Street, Poona. See Figure 1 below for the existing and proposed ramp locations.

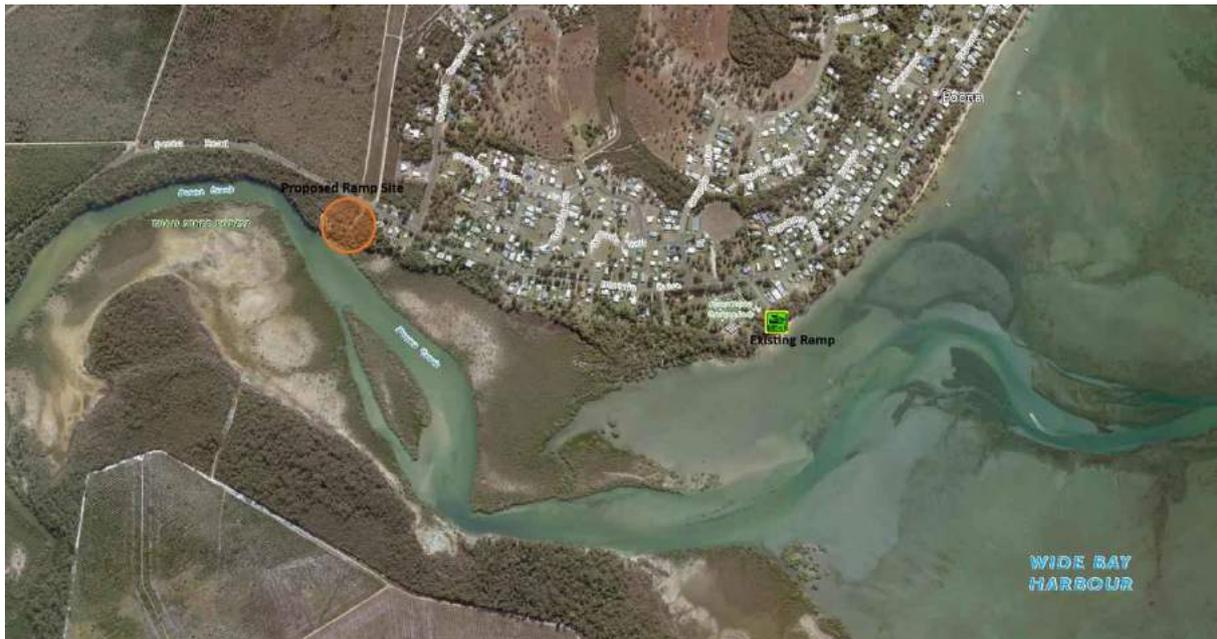


Figure 1- Existing and proposed Poona boat ramp locations

2.1 Existing ramp

The existing boat ramp was built in 1989 to meet recreational boating demand of the Poona community. The existing boat ramp abuts extensive tidal flats of Great Sandy Strait. The ramp is significantly tide restricted as the tidal flats in the area are at 1.5 m to 1.6 m above the level of Lowest Astronomical Tide (LAT). Due to the small size of the recreational fishing community the restricted tidal window in which the existing boat ramp can be used was not a major issue initially. However, as the township has grown the demand for recreational boating has increased, and the small tidal window the ramp is proving is insufficient to meet demand. The township currently has about 335 homes and a permanent population of 481, swelling to larger numbers on weekends and during holiday periods. Poona provides holiday accommodation options with a range of holiday rental homes and a caravan park.

The existing ramp is exposed to wind and wave action from the NE, E and SE directions at higher tides. Any expansion of the facility is restricted by the space available for parking. There have been requests by the local community to dredge a channel from the existing ramp to deeper water. TMR rejected the dredging proposal siting that dredging is not supported in the Marine Parks jurisdiction and the maintenance of a deep channel is technically and financially prohibitive. Even if a dredged channel was provided, other restrictions such as exposure to wind and wave conditions and no expansion to CTU parking, would limit any expansion opportunity in the current location.

TMR officers met with a Marine Parks officer in September 2018 to discuss the options available to improve the tidal accessibility to the boat ramp. Marine Parks was in support of relocating the boat ramp to a more tidally accessible location if there is no requirement for future dredging and no queuing beaches are constructed.

2.2 Demand forecasting study

The *Recreational Boating Facilities Demand Forecast Study 2017* includes analysis of the available boat ramp lanes and demand within the FCRC area. It identifies that there will be a shortfall totalling 13.1 boat ramp lanes by 2036. Figure 2 shows the projected boat ramp lane shortfall for the FCRC area. Refer to the following link on the TMR website for access to the full demand forecasting study for the FCRC area: <https://publications.qld.gov.au/dataset/recreational-boating-facilities-demand-forecasting-study-2017>. An extract about Poona from the demand study is included at Appendix A.

Evaluation category	Existing effective capacity*	2016		2021		2026		2036	
		Demand	Shortfall	Demand	Shortfall	Demand	Shortfall	Demand	Shortfall
All vessels, all facilities	30.9	34	3.1	36	5.1	39	8.1	44	13.1

*Existing effective capacity includes MIIP announced projects/upgrades as at December 2016

Figure 2 – Demand forecasting study extract – Table 11 Boat Ramp Lane Shortfall FCRC

A Poona Creek boat ramp is recommended as a 'Priority 1' by the GHD demand study indicating that the facility is needed to meet existing demand. The study recommended installation of a 2-lane ramp with 45 Car Trailer unit (CTU) spaces and an additional feasibility study to determine if a floating walkway is viable. Initial assessment of the floating walkway by the BIU has determined that it does not appear to be required and will be evaluated further should the boat ramp concept progress to project stage. As there are no salt-water crocodiles present, and the boat ramp is wider than the demand requires it is unlikely a floating walkway will be necessary.

2.3 Site constraints

The proposed boat ramp location at Poona Creek is in a section of the creek where the shoreline includes sections of eroded near vertical slopes. The top of the bank is several metres above mean sea level (MSL), and some areas consist of thick undisturbed vegetation. Figure 3 shows a section of eroded shoreline adjacent to the proposed ramp location. This is near where the proposed carpark will be located, so there is a potential need for stabilisation. To reduce the erosion risk to the carpark at the top and the need for the base of the slope to require armouring in future, further consideration will need to be given to positioning the carpark as far landward as possible during the detailed design process. Similarly, on-site drainage and stormwater discharge will need to be carefully designed so as to avoid adverse environmental impacts.



Figure 3 - Steep creek bank adjacent to proposed ramp location

Figure 4 shows the area of the shoreline which the proposed ramp and turnaround area will occupy and highlights the number of trees and dense vegetation. This section of bank is less steep, however is only traversable by foot along an informal track. For vehicle access to the shoreline the slope would need to be adjusted by either cutting into the bank or filling out towards Poona Creek.



Figure 4 - View of vegetation along the less steep sections of creek bank

In addition to the topographical and vegetation restraints, the proposed site includes a single overhead powerline that crosses Poona Creek at the proposed ramp location. During the initial concept design development, the power line was raised as a possible issue due to its proximity to the proposed ramp alignment and access road. The height of the power line is estimated at RL 25.5 m. The line will not cause an unacceptable hazard to boat launching due to its height above the natural surfaces. Signage for sailing vessels to be aware of the overhead wire danger will be required should the concept progress to project stage. Figure 5 shows the power pole and overhead wire near the proposed site.



Figure 5- Power line pole and single overhead wire that crosses Poona Creek

3 Concept design

After consideration of the concept location and configuration provided by the *Recreational Boating Facilities Demand Forecasting Study 2017*, TMR's BIU produced two initial concept designs using the hydrographic and land survey of the boat ramp site. These included one concept with a traditional turnaround area in the flatter lower portion of the shoreline with a steep access road to the higher level.

3.1 Initial concept designs

Two options were initially identified for car parking. These included the existing partially cleared area to the west of the power pole, and a large rectangular area of existing native vegetation. The two options require different approaches to the ramp due to the proximity of the large power pole between them. Options 1 and 2 are included in Appendix B.

3.2 Preferred carpark concept

FCRC, being the potential provider of the carpark, decided to proceed with using the existing partially cleared area in LOT 1 AP 15926 (see Figure 6 below) for CTU parking as this area is primarily cleared of vegetation. Alternate areas were considered unsuitable due to dense undisturbed vegetation.

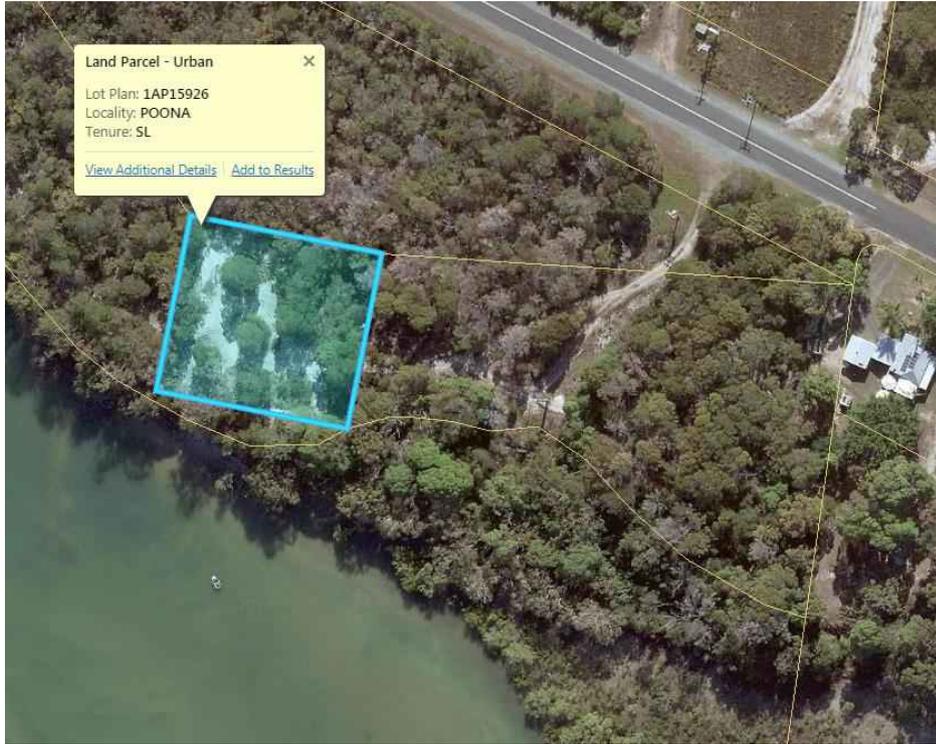


Figure 6 - Lot 1 on plan AP15926

Due to the proposed location of the carpark and the preference to orient the access between the ramp and carpark in a more direct alignment, Option 3, was developed. This option reduced the amount of fill required by altering the turnaround area. The required vehicle turn reduced from 180° to just over 90°. The preferred concept (Option 3) is included in Appendix C and shown in Figure 7 below.



Figure 7- preferred configuration

3.3 Functionality assessment

3.3.1 Lanes and capacity

The proposed facility will provide two-lane access to Poona Creek. The existing boat ramp at Poona Beach is a single-lane ramp. The additional two lanes in the concept design will meet the requirements of the demand forecasting study. TMR and FCRC note that the community request was for a single-lane boat ramp. A reduction to one lane would reduce in-water works costs. However, due to the complex vehicle turnaround area, limited manoeuvrability options at the top of the ramp, and limited ability of drivers to reverse down a single lane, this feasibility study recommends that a minimum of two lanes is provided for safe access. The usual TMR requirement of 22.5 CTU parks per lane will not be necessary in this case, as the two lanes are provided to facilitate safe access and manoeuvrability, rather than to meet demand.

3.3.2 Tidal accessibility

The tidal range at Poona is estimated from the Queensland Tide Tables primary port of Bundaberg (Burnett Heads) and the secondary port of Snout Point with tidal planes presented in Table 1. The Australian Height Datum (AHD) to LAT conversion value of 1.292 m was calculated based on tidal observations by Maritime Safety Queensland (MSQ) surveyors. For additional details refer to MSQ Hydrographic Survey Drawing E550-075 in Appendix D.

A low water restriction was observed at the boat ramp site – that is, water in Poona Creek doesn't all flow out into GSS at lower tides owing to constraining shoals and bar near the mouth. However insufficient data was collected to determine the extent of the restriction. For the purpose of this study any benefit of a low water restriction at the ramp site has been ignored as insufficient information is available. Parts of Poona Creek closer to the mouth than the proposed location have shallower depths than the boat ramp site. These shallow depths in the approach channel are the access constraint rather than depths near the toe of the ramp.

Table 1- Tidal Planes

SNOUT POINT: SEMIDIURNAL TIDAL PLANES, Meters above/below AHD							
LAT	MLWS	MLWN	AHD	MSL	MHWN	MHWS	HAT
-1.29	-0.84	-0.37	0.00	0.1	0.57	1.05	1.68

The proposed ramp toe at Poona Creek is at RL -1.1m AHD or 0.2m above LAT. MSQ Hydrographic Survey E550-075 Sheet 5 of 5 (Appendix D) shows a shoal in Poona Creek with a depth of -0.7m AHD or 0.6m above LAT. The existing ramp toe on Poona Beach is located at RL +0.33m AHD or 1.6m above LAT.

These depths indicate an improvement in tidal access at the proposed new ramp of 1.0m compared to the Owen Cox Street existing boat ramp.

Putting these figures another way and assuming boats need 0.5m of water to move with tilted motor and noting that predicted tidal heights are heights above LAT:

- A predicted tidal height of 2.1m or higher is needed to use the Owen Cox Street existing ramp.
- A predicted tidal height of 1.1m or higher would be required to navigate over the 0.6m above LAT shoal in the Poona Creek channel.
- At 1.1m tidal height, the depth of water above the toe of the proposed Poona Creek ramp would be 0.9m, which is greater than the minimum 0.5m needed.

- Therefore, at any tide of 1.1m or higher, Poona Creek will be navigable, and the proposed Poona Creek new boat ramp will be usable.
- Given that 2.1m tidal height is required for use of the existing Owen Cox Street boat ramp and 1.1m tidal height would be required to access the proposed new Poona Creek ramp, there would be a 1.0m improvement in tidal access resulting from construction of a new ramp.

Caution: The hydrographic survey used to make the above observations was a snapshot at a point in time. As shoals move, heavy rain-driven flows occur, and long dry seasons occur, the minimum depths in the approach channel to any new Poona Creek boat ramp will change. Navigable depths may improve or worsen. Elsewhere (see 4.3.1) in this study reference is made to no dredging occurring in the future to modify access channel depths. It may be possible to maintain (with land machinery – long arm excavator) depths immediately adjacent to any new Poona Creek boat ramp.

Figure 8 shows the standard tidal curves for various tidal ranges up to 3m and has been extracted from the Queensland Tide Tables. Plotting a 1m water level difference along the steepest section of the curve shows that during spring tides (range ~2.0 m) the proposed ramp can provide increased accessibility in the order of 4.5 hours on each tidal cycle (tide cycle length is approximately 12.4 hours). This corresponds during spring tides to a 36% increase in navigational access at the proposed new ramp compared to the existing ramp. Other factors including allowance for vessel draught and different tidal cycles have not been analysed. During typical neap tides, it is expected the proposed ramp would be useable by small trailer boats all day.

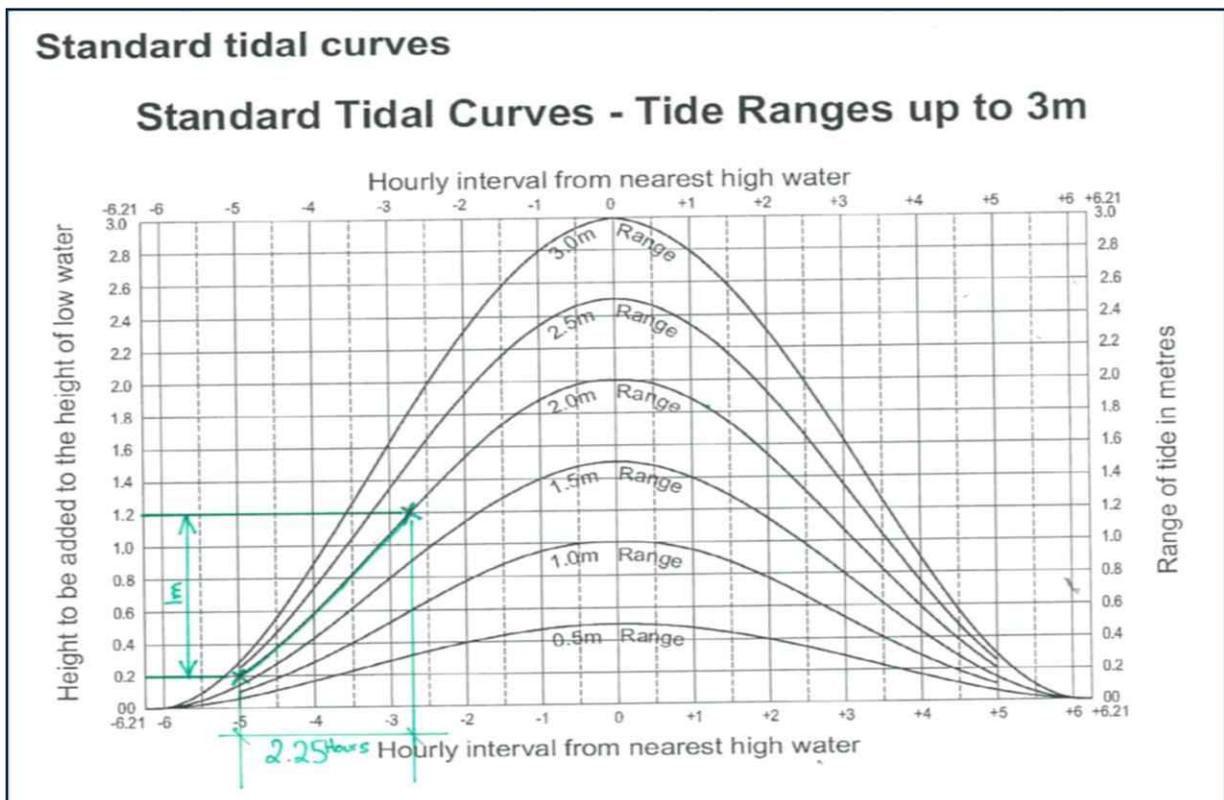


Figure 8 - Standard tidal curves - showing potential increased accessibility of proposed ramp

The tidal accessibility was investigated using a tidal prediction dataset available for T1 Beacon which is 13 km from Poona. The comparison may not be fully accurate but will give a reasonable estimate for an order of magnitude comparison between the existing and proposed new boat ramp locations (Figure 9).

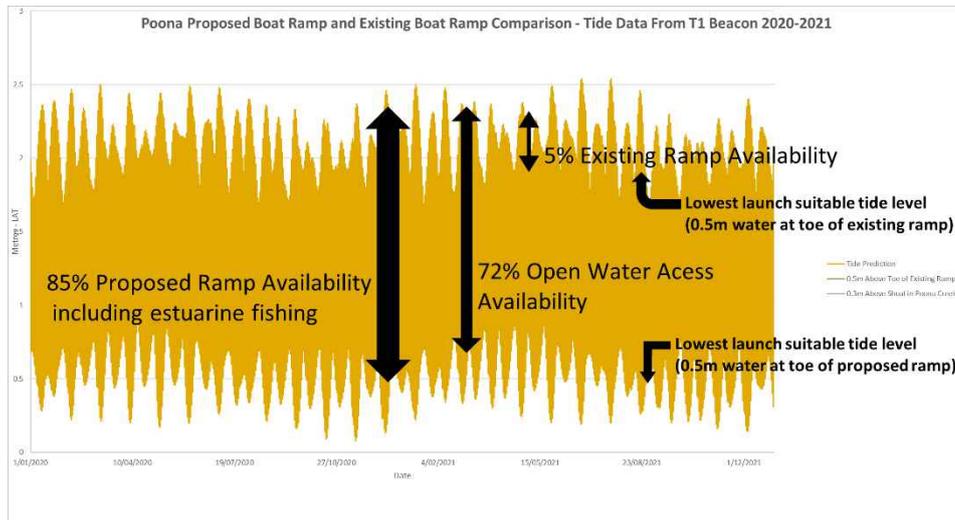


Figure 9 – Comparison of tidal accessibility using a tidal prediction dataset from T1 Beacon

This comparison indicates that 5% of the time there will be 0.5m or more of water at the existing boat ramp to launch an average size boat. Small boats with less draught can be launched from the ramp for more than 5% of the time. In the proposed new ramp location for 85% of the time there is 0.5m of water at the ramp. There is a shoal between the proposed ramp and the open water that is likely to restrict access. A boat with less than 0.3m draught could reach open water about 72% of the time if depths remain similar to the MSQ Hydrographic Survey used for this feasibility study.

Graphical presentations of comparison of the tidal accessibility at the proposed boat ramp during a spring low tide, a neap low tide and at the lowest possible tide at the existing ramp are shown in Figure 10(a), 10(b) and 10(c).

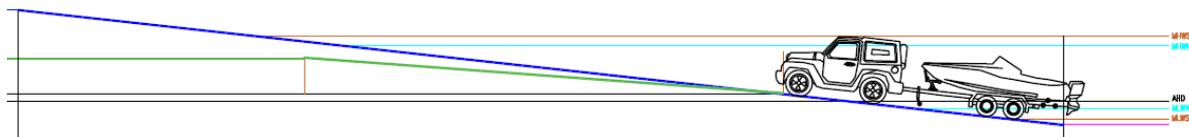


Figure 10(a) – Spring low tide at the proposed new ramp

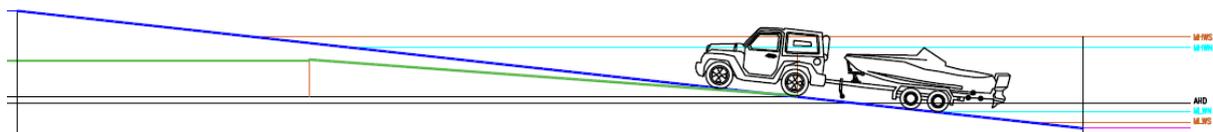


Figure 10(b) – Neap low tide at the proposed new ramp

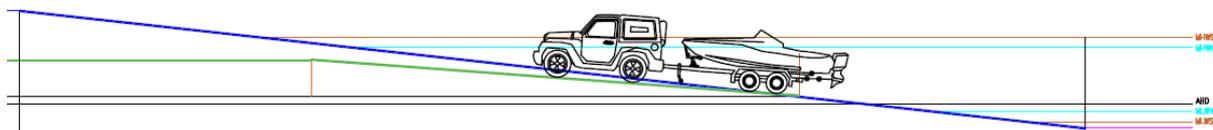


Figure 10(c) – Launching from the existing ramp at lowest possible tide

3.3.3 Parking

FCRC developed a concept design for the carpark including the provision of approximately 23 CTU spaces and eight regular car parking bays. For a part-tide facility with two lanes approximately 30 CTU spaces would be more suitable. If there is demand for more than 23 CTU parking spaces, these could be accommodated along the Poona Road shoulder. FCRC has prepared a preliminary concept for the land-based infrastructure. An extract of the proposed carpark design is included in Appendix E.

4 Environment and cultural heritage

4.1 Cultural heritage

The potential boat ramp and car park site was inspected jointly with FCRC and the Traditional Owners, representing the Butchulla Land & Sea Claim #2, on 26 September 2018. The inspection identified that the proposed location is highly significant to the Butchulla People.

Key requirements by the traditional owners were that TMR/FCRC would engage an archaeological consultant to undertake a Cultural Heritage Field Survey in conjunction with the Butchulla People. The Cultural Heritage Field Assessment (Consultation) Log Book is included in Appendix F and summarised the onsite discussions and actions agreed to at the site inspection.

It is likely that should the concept proceed to project stage it may require installation of interpretative signage or other cultural acknowledgement, relating to Butchulla traditional ownership, cultural practices, history and language of the general area.

4.2 Approvals and permits

FCRC engaged Urban Catalyst 3 Pty Ltd to identify the likely statutory approval requirements for any project resulting from this study. Based on the report by Urban Catalyst 3 Pty Ltd, Table 2 provides a summary of approvals expected to be required for the works.

Table 2- Environmental approvals and permits summary

Approval required	Assessment agency
Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Referral likely not required – self assessment by TMR’s environmental officer is required to confirm impact will not be significant once the design is completed and the full extent of works is confirmed.
Development permit for operational works (tidal works or work in a coastal management district) for tidal works and interfering with quarry material, (Coastal Protection and Management Act 1995)	State Assessment and Referral Agency (SARA), TMR and Department of Environment and Science (DES) Land owners consent required from Department of Natural Resources, Mines and Energy (DNRME)
Discharge of environmental offset obligations (Environmental Offsets Act 2014) (Based on clearing of between 150-300 m ² of marine plants)	DES
Contaminated Land (Environmental Protection Act 1994)	Search of register required. DES
Acid sulfate soils (Environmental Protection Act 1994)	DES Field ASS testing was undertaken during Geotech investigations. Indicating PASS. Excavated material to be treated and tested during construction. Works to comply with the Environmental Protection Regulation 2008.

Approval required	Assessment agency
Marine plants (Fisheries Act 1994)	SARA and Department of Agriculture and Fisheries (DAF)
Marine parks permit (Marine Parks Act 2004)	DES
Clearing permit (Nature Conservation Act 1992) Only required if flora survey detects any endangered, vulnerable or near threatened plants in the clearing impact area. Otherwise an exempt clearing notification must be submitted at least one week prior to the clearing commencing.	DES
Species management program (Nature Conservation Act 1992) Targeted survey to identify breeding habitat is required. Otherwise A low risk species management program to be completed and registered with DES.	DES
Operational works development permit for clearing native vegetation (Vegetation Management Act 1999)	SARA and DNRME Exemption may apply under Schedule 21, Part 1, Item 14 of the Planning Regulation 2017

4.3 Environmental issues

The approvals summary report included two key items that would require additional clarification prior to the commencement of applications for any works project approvals.

- a flora study to be undertaken during the development phase to identify any protected or endangered plant species
- a field study to identify the presence of breeding habitat to satisfy the requirement of the Nature Conservation Act 1992.

The report did not identify any items indicating works would be unable to proceed due to environmental issues or approval restraints.

4.3.1 Future dredging

As highlighted in Section 3.3.2 the proposed boat ramp access is limited by shoals and shallow bar in the Poona Creek entrance itself. Although technically achievable, future dredging of the creek entrance will not be possible due to its location within the Great Sandy Straits Marine Park. Initial advice provided by the Marine Parks was that it is unlikely any permits would ever be issued for dredging within Poona Creek or its entrance.

However, if the boat ramp is built at the proposed location after obtaining all necessary approvals, the usual practice is that the facility will be excluded from the Great Sandy Marine Park. In any approved facility, in order to maintain safe access, FCRC as manager or TMR as owner would be allowed to remove silt or sand built up on the ramp or at the toe of the ramp using a suitable equipment to a limit of 300m³ of silt or sand per year. In practice this means siltation round the toe of a ramp can be removed by a long arm excavator.

No historical flood data was available for the site. However, considering the catchment size and rainfall data for the area, significant flood flows would be expected in the creek. Such flood flows would encourage self-flushing. Therefore, the likelihood of sand or silt build-up on the ramp is low. It is more likely that redistribution of any downdrift sand onto the shoals in the access channel would occur. This appears to have been the case historically.

4.3.2 Vegetation clearing

There is native vegetation present in the proposed development footprint, including least concern and of concern regional ecosystems and essential habitat. If the proposed development is to proceed, assessment against State Code 16 – Native vegetation clearing will be required. In that case a full site inspection regarding the vegetation clearing impacts will be conducted and would include confirmation of any mangroves and other marine plants present in the proposed development area that may require removal, which would trigger assessment under State Code 11 - removal, destruction or damage of marine plants and will be assessed by DAF.

4.4 Land tenure

The works will require owners consent for approval, the requirements being listed in Table 2. Three separate lots/areas are impacted by the works.

4.4.1 Unallocated state land (USL)

Most of the boat ramp is located within unallocated state land and will require owners consent from DNRME. Generally, TMR has been able to construct facilities on unallocated state land without additional land tenure and this is expected to be the case at the proposed ramp location.

4.4.2 Lot 1 on plan AP15926

A small section of the boat ramp access road and approximately half of the carpark is located within Lot 1 on Plan AP15926 (see Figure 6 on page 6). This is described as Estate in Unallocated State Land within the title. Owners consent will be required for FCRC to construct the proposed carpark. DNRME may require tenure to be changed to a reserve if consent cannot be provided for the construction of the carpark under the existing tenure. DNRME advised that any action taken under the Land Act 1994 cannot be inconsistent with native title for these lots. Therefore, further consultation is required with DNRME to clarify these requirements should the proposal proceed to a works project.

4.4.3 Lot 94 on plan MCH5498

The carpark access road, a small section of the boat ramp turnaround area and approximately half of the carpark are located within Lot 94 on Plan MCG5498. This lot is reserve with FCRC as the trustee. The sub-purpose of this reserve is listed as environmental protection. As per the advice received from DNRME, use of this land as a carpark is not consistent with the current purpose of the reserve. DNRME further advised that if the proposed development triggers a Material Change of Use (MCU) under the FCRC Planning Scheme, owner's consent for development on State Land will be required from DNRME to lodge an application. However, it is recommended additional advice be sought from DNRME to clarify these requirements.



Figure 11 – Lot 94 on plan MCH5498

4.5 Estimated timing for design and approvals

Timeframes for detailed designing of the in-water works, land-based facilities, intersection upgrade and obtaining necessary environmental and land tenure approvals to execute this project are estimated as follows:

1. archaeological survey of the site – 2 months
2. detailed design works – 4 months
3. owners consent from DNRME for the boat ramp development – 2 months
4. owners consent from FCRC for the boat ramp construction – 1 month after the new council is appointed
5. Marine Parks permit for the boat ramp construction – 3 months
6. Development Approval (DA) – Tidal Works and Marine Plant Disturbance – 3 to 4 months depending on the Native Title clearances – payments of offsets may be required
7. required land tenure change for the car trailer park construction – 3 months

Some of the approval activities can run parallel to each other but some of them are depending on an approval of preceding activities. The approval processes could take up to 9 to 12 months after completion of detailed design.

5 Geotechnical conditions

A geotechnical investigation was undertaken at the proposed boat ramp and carpark site by TMR's Geotechnical Section. The field inspection was undertaken during January/February 2019 and the full investigation report is included in Appendix G.

A combination of boreholes, auger holes and cone penetrometer testing (CPT) was undertaken to determine subsurface conditions that would affect the boat ramp, turnaround area and carpark design.

Auger holes 5 and 6 along the turning area alignment indicated the surface, to approximately 1m below natural ground level, was silty sand and could be categorised as 'loose'. Auger hole 5 included dynamic code penetrometer (DCP) testing. This showed increased soil stiffness to over 20 blows per 100mm at approximately 2m below natural surface.

Test pit number 4, at the top of the access ramp to the turnaround area, showed loose silty sand to 1.5m below natural surface becoming dense beyond 1.5m.

The in-water CPT showed relatively soft material to 1m below the seabed with increasing resistance until refusal on hard material (likely very dense sand or rock) at between 3m and 5m below the seabed.

These results indicate that although there is some loose sand present in the initial 1m of soil the ground conditions improve to a hard layer at relatively shallow depths. This indicates that the turnaround area and boat ramp can be constructed in fill, as shown in the concept plan, without a high risk of excess settlement or subgrade failure.

6 Cost estimate

6.1 Boat ramp construction

A cost estimate based on the preferred concept design has been prepared and is presented in Table 3. The estimate is based on volumes and quantities estimated from the design, based on plan areas and average thicknesses. This would require further refinement once the structure is modelled and exact quantities can be determined.

A contingency of 40% has been applied in accordance with Table 3.6 of the TMR project cost estimating manual. This amount should be enough to cover additional costs including the required flora and breeding habitat studies, approval costs, detailed design costs, tendering and contract administration.

Table 3 – boat ramp cost estimate

Item	Cost (Ex. GST)
Pavement including asphalt to turnaround area and Type 2.1 unbound pavement material.	\$72,000.00
Boat ramp works.	\$1,262,000.00
Scour protection (precast concrete mattress)	\$100,000.00
Total (Ex. GST)	\$1,434,000.00
Contingency (40%)	\$573,600.00
Total boat ramp budget estimate (Ex. GST)	\$2,007,600.00

In addition to this it may be required to pay some offsets to DAF to compensate for the disturbance of marine plants as part of the Development Approval process.

6.2 Carpark works

The concept design for the land-based works included a cost estimate for the carpark summarised in Table 4.

Table 4 Carpark cost estimate

Item	Cost (Ex. GST)
23 CTU parks, 8 standard parks, 2 rigging parks and a footpath connection from the carpark to the ramp	\$970,000.00
Treatment to access road and Poona road intersection	\$250,000.00
Total carpark budget cost (Ex. GST)	\$1,220,000.00

7 Conclusions and recommendations

The proposed site includes enough area, water depth and access to construct a tide restricted two-lane boat ramp. The proposed new ramp would have better tidal access than the existing boat ramp at Owen Cox Street. The level of tide restriction at the ramp is difficult to accurately determine as a low water restriction was observed at the proposed boat ramp site. Due to siltation near the mouth of Poona Creek, there are access restrictions (0.6m above LAT at time of survey) to the boat ramp for users returning from Great Sandy Straight.

Based on existing bathymetry conditions access to the proposed ramp is expected to be about 1m better than the existing ramp and will provide an approximate 36% increase in availability during spring tides and close to full access at neap tides for small boats.

Should this study concept progress to become a works project, stakeholders should note that dredging for access to Poona Creek is not supported by TMR policy and would not be allowed by the Department of Environment and Science as a tidal works approval for dredging within the Marine Park would not be granted.

There is evidence of cultural heritage and environmental sensitivities at the site. These would require further assessment through archaeological survey and environmental studies. These investigations would be required prior to completion of detailed design.

No change in seabed tenure would be required for TMR in-water works.

FCRC would need to consult DNRME regarding the MCU (if applicable), tenure change requirements and conditions for owners consent over the land required for the carpark and access road, and to determine if changes in land tenure are required.

Further consultation would be required with stakeholder groups, including the Poona Progress Association, as part of any preliminary design phase before either TMR or FCRC proceeding to detailed design.

The cost to TMR to construct the ramp is approximately \$2,010,000 (ex. GST).

FCRC would need approximately \$1,220,000 (ex. GST) to construct the car-trailer park, access road and intersection upgrade. FCRC should consider all the issues examined in this study and decide whether to support FCRC funding of the landside components of a new Poona Creek boat launching facility in its forward work program.

The results of this study will be tabled at a FCRC Council Meeting for further consideration. If supported to proceed, the project will be included on Council's forward works list for Council-wide prioritisation as part of capital works budget deliberations. It is also expected that FCRC will request the Queensland Government (through TMR) to align funds for design, approval and construction of the in-water components.

When making assessments and prioritising investments, Transport and Main Roads considers:

- community consultation via the QGOV Get Involved website
- proposals from local members on behalf of constituents
- the recommendations of the most recent demand forecasting study
- feasibility and constraints (foreshore profile, depths in access channels, wave climate, current scouring, siltation, marine parks, fish habitat areas, environmental offsets, mangrove clearing and so on)
- available departmental funding (capital and grant) for in-water project components
- maximising benefit to maximum numbers of the boating public
- agreement from local government partners willing to commit funding for land side components based on their budget priorities and works programs
- foreshore land availability and access
- council project proposals
- statewide equity considerations and demographic challenges for remote and sparsely populated areas.
- a multi-criteria analysis to assist with relative state-wide project priority.

Successful projects are included in a multi-year rolling works program. The majority of projects are scheduled over 2 to 3 years with design and environmental approvals undertaken in the first year and construction in a second year. Prioritisation of funding, technical constraints and local conditions such as severe weather can result in projects being staged over longer time frames.