



St Leonards

Draft Local Port Area Plan

February 2024

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Acknowledgement of Country

Wadawurrung Acknowledgement

We deeply respect our people of the past. Our Elders, children, men and women.

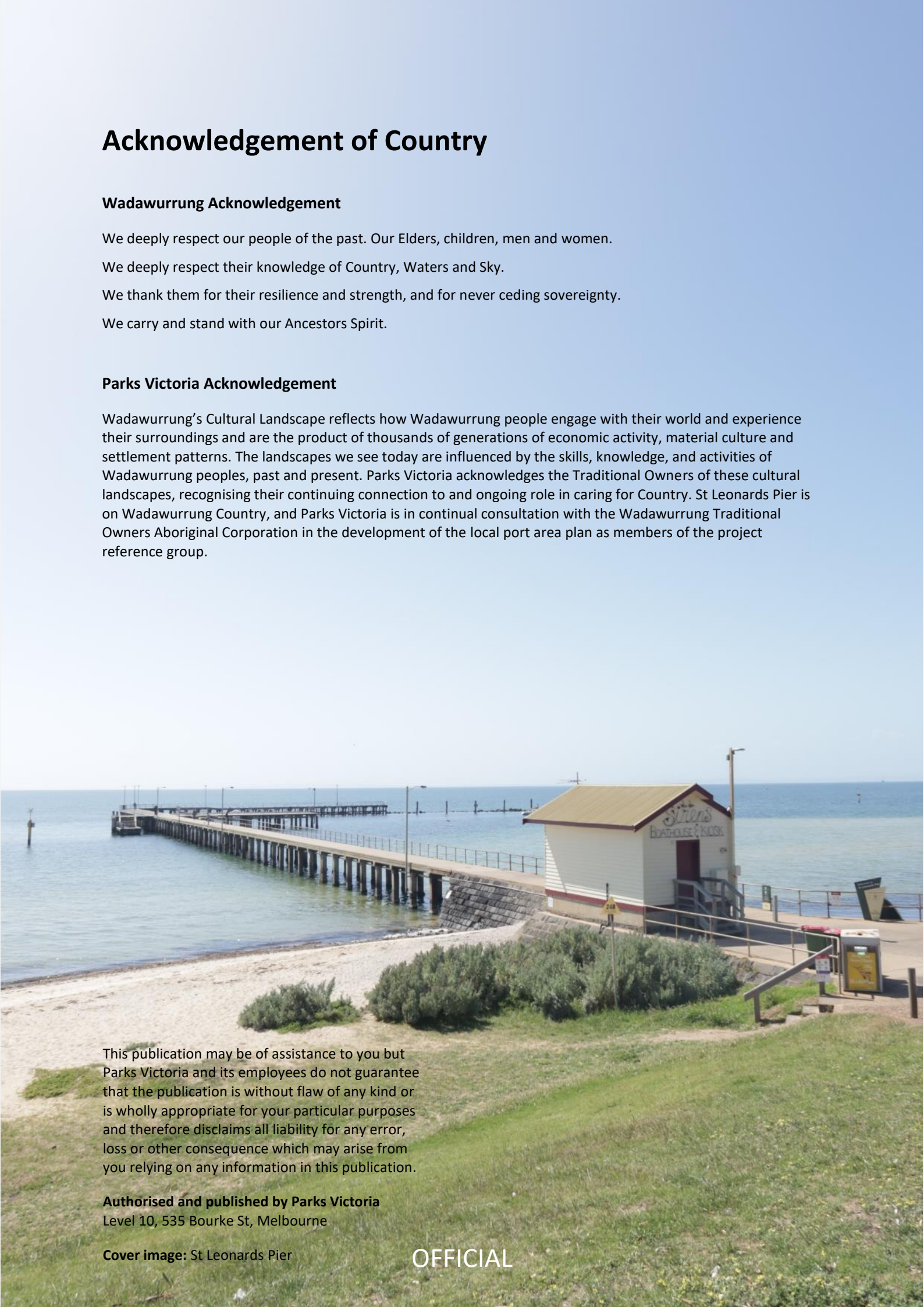
We deeply respect their knowledge of Country, Waters and Sky.

We thank them for their resilience and strength, and for never ceding sovereignty.

We carry and stand with our Ancestors Spirit.

Parks Victoria Acknowledgement

Wadawurrung's Cultural Landscape reflects how Wadawurrung people engage with their world and experience their surroundings and are the product of thousands of generations of economic activity, material culture and settlement patterns. The landscapes we see today are influenced by the skills, knowledge, and activities of Wadawurrung peoples, past and present. Parks Victoria acknowledges the Traditional Owners of these cultural landscapes, recognising their continuing connection to and ongoing role in caring for Country. St Leonards Pier is on Wadawurrung Country, and Parks Victoria is in continual consultation with the Wadawurrung Traditional Owners Aboriginal Corporation in the development of the local port area plan as members of the project reference group.



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Cover image: St Leonards Pier

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Wadawurrung Connection to Sea and Coastal Area

Wadawurrung people hold a deep and spiritual connection to our Coastal and Sea Country. Our *Karringalabil* (great creator spirit) Bunjil created Warri country and all waterways on Wadawurrung *Dja*.

Wadawurrung ancestors honoured seas, lakes and waterholes, as they did with all of *Dja*. The coasts hold a sacred place in our hearts and murrup (spirit), representing an extension of ourselves—like a *Djilang* (tongue) connecting us to *Dja*, the seas, and our ancestors. In the past, these coastal areas served as vital links for trade and travel routes across Warri *Dja*. The memories embedded in places like St Leonards remain a reminder of the intangible cultural heritage which is very much alive for Wadawurrung people.

However, the ongoing destruction of Warri *Dja* casts a shadow over our present, impacting our people and animals profoundly. Despite these challenges, our commitment to care for country and coastal restoration is ongoing. Wadawurrung people are actively engaged in efforts to restore the health and vitality of our coast and seas.

We extend an invitation, "Koling wada ngal," inviting others to walk with us on this journey towards a healthier Country, coast, and seas.



Image: St Leonards Pier

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Executive Summary

St Leonards Pier (the pier) on Wadawurrung Sea Country, is a popular pier for recreational activities on the Bellarine Peninsula. It is a growing destination for day trippers and a potential pick up and drop off location for smaller vessels. To ensure it continues to be a safe and thriving maritime precinct for many more years to come, Parks Victoria is developing a local port area plan (plan) for the pier and water users. This project is part of the Victorian Government's *Sustainable Local Ports Framework* and Parks Victoria's local ports forward planning program.

The St Leonards Local Port Area Plan project involves engaging with stakeholders and the community to gain an understanding of their interactions and experiences at the pier. This involves gaining insights into usage patterns, identifying challenges faced by users, and possible opportunities for its future development. The overarching goal is to generate valuable input that can be used as a foundation in shaping the plan's development. The project does not only consider the potential aspects surrounding the pier's future state but also examines visitor and recreational opportunities, with consideration of environmental and heritage values. Furthermore, it seeks to facilitate water activities like scuba-diving, fishing, and snorkelling while adhering to Australian Standards regarding vessel channels. By exploring various projections for the future, this plan focuses on enhancing both safety measures and operational performance at the pier.

This draft plan provides the technical background and existing conditions of the pier. The draft plan also presents two pier design options for addressing the existing challenges associated with the pier and its surrounding waters. The options are focused on the rehabilitation of the pier, improving safety and accessibility, providing primarily for recreational uses, protecting identified environmental and heritage values, as well as creation of safe and navigable water for all of the pier's users.

Stakeholder and community input will be sought at key stages of the development of the plan.

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1 Introduction

Parks Victoria is the port manager for the local port of Port Phillip and the committee of management for the St Leonards Pier (the pier). AW Maritime Pty Ltd (AWM) has been engaged by Parks Victoria to provide consulting services for the development of a plan which addresses the future opportunities of the pier and surrounding on-water uses.

Local Port Area Plan

Local ports play an important role for businesses and local communities. This plan will help guide Victorian Government investment priorities and provide a sustainable approach to meeting economic, tourism and community needs. With a focused approach on enhancing on-water activities, the plan considers current commercial and recreational demands and anticipated future requirements.

Parks Victoria has specifically determined this plan address several issues including a review of existing plans and reports, an analysis of current and future demand, a technical assessment of local port assets, options for future uses and supporting infrastructure, consideration of navigation safety, swing mooring arrangements, environmental and heritage values and community feedback.

Study Area

St Leonards Pier sits on Wadawurrung Sea Country and is located 110km south-west of Melbourne by land and 45km by sea. It is located on the Bellarine Peninsula and lies between Indented Head and Swan Bay with its foreshore reserve stretching along its eastern frontage of Port Phillip.

The pier is located at the end of Murradoc Road, which is the commercial node of the town and the main road from Geelong. The pier is popular for fishing, snorkelling, scuba-diving, boating, socialising and walking.

There are significant nature reserves around the study area, the Salt Lagoon Wildlife Reserve to the north boundary, Edwards Point Wildlife Reserve to the south boundary and St Leonards Lake Reserve.

There are several notable features in and around the study area including:

- Sirens Boathouse and Kiosk
- St Leonards Pier
- Swing moorings
- Port Phillip Bay coastal reserve (north)
- First Avenue Beach and timber groyne
- St Leonards Hotel
- Harvey Park (south)
- Dan Dan Nook Children’s Playground which connects to Harvey Park
- Car parking which connects to Port Phillip Bay Coastal Reserve

Furthermore, aside from the maritime aspects discussed earlier, the plan recognises the significance of activities on land such as walking dogs, enjoying recreational activities at the beach, utilising the playground near the pier entrance, and protecting local plant and animal life along with other environmental assets.



Figure 1- Location of St Leonards Pier (Source: Melway Map 460)



Figure 2- St Leonards Pier study area and context map of Port Phillip (Aerial Image: Nearmap 14/09/23)

Purpose and Objectives

This plan has been developed to improve the function and sustainability of the pier and surrounding on-water uses. This should help to determine future layout, service provision and investment at the site. The objectives are:

- Ensure the pier remains accessible for future recreational uses
- Consider the needs of the current and future demand for the assets and services
- Propose new option layouts for the future of the pier
- Provide assessment for implications on dredging
- Define the safe navigation requirements for vessels
- Consider potential impacts on identified environmental and heritage values

The development of the plan is being guided by a project reference group comprising members from Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC), the Department of Transport and Planning, Parks Victoria, Bellarine Bayside Foreshore Committee of Management (Bellarine Bayside), the City of Greater Geelong, and Department of Energy, Environment and Climate Action (DEECA).

The plan will address:

- Improved function and layout of the rebuilt pier (including swing moorings, breakwater and safe navigation around the pier)
- Utilisation of moorings and berths in consideration of current and future activity.

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- Continued facilitation of the various recreational opportunities offered by the pier, which includes swimming, scuba-diving, fishing, boating and promenading.

Strategic Context

The Victorian Government is dedicated to developing a long-term strategy for the future management and maintenance of local port infrastructure. This is being implemented through the *Sustainable Local Ports Framework 2021* (framework) that will help manage, maintain and prioritise funding for these assets where it is needed the most.

The framework provides a consistent planning and decision-making pathway to support wider precinct planning through local port area plans. Four principles will be applied to prioritise future upgrades and improvements. These include Local Economy and Job Growth, Tourism and Recreation, Emergency Response capabilities, and Community and Cultural Value.

Guided by the framework, the draft St Leonards Local Port Area Plan has been developed using a place-based approach, leveraging local knowledge and expertise to plan for future local port infrastructure assets and services.

Policy Context

The objective and principle of the *Marine and Coastal Act 2018* centres on the preservation and maintenance of the marine and coastal environment, with a focus on ensuring its longevity for future generations. In line with this, the *Marine and Coastal Policy 2020* (policy) has been established as a roadmap with a 15-year vision that envisions a 'healthy, dynamic and biodiverse marine and coastal environment that is valued in its own right and that benefits the Victorian community, now and in the future'. It serves as a strategic guide for planning processes, management approaches, as well as decision-making protocols.

Furthermore, the policy is supported by the *Marine and Coastal Strategy 2022* (strategy). This strategic framework outlines a series of prioritised actions to be undertaken over the course of the next five years to effectively achieve the objectives set forth in the policy. The strategy recognises that formal and informal collaboration is required for effective and integrated delivery. The Victorian Government, Traditional Owners, marine and coastal managers, communities and individuals all have important roles and responsibilities in the joint implementation of this strategy.

The draft St Leonards Local Port Area Plan utilises both the policy and the strategy as reference documents to lead the management of Victoria's marine and coastal environment.

2 Background

Cultural Values

Parks Victoria is committed to continue working with the WTOAC to understand and interpret their aspirations for St Leonards Pier. WTOAC has been involved in the development of this draft plan, and further engagement and investigations will be required to understand their cultural values and stories of the site.

Land Tenure and Planning

The land management is addressed in the *Northern Bellarine Coastal and Marine Management Plan* (December 2019) and *Adopted St Leonards Structure Plan* prepared by the Greater Geelong City Council (March 2015).

The land located around the pier comprises Crown Land. The area has three different committees of management:

1. Bellarine Bayside manages areas covering the Port Phillip Bay Coastal Reserve. It is responsible for overseeing the management of the foreshore area in St Leonards which includes informal open spaces, designated parking areas, the entrance to pier, as well as the Sirens Boathouse and Kiosk.
2. City of Greater Geelong is the public land manager of areas along the foreshore including Harvey Park.
3. Parks Victoria manages the marine environment in St Leonards Harbour including the swimming area, boating zones and the pier.

As the port manager, Parks Victoria is responsible for ensuring the safety, efficiency, and effectiveness of port operations. We also manage the infrastructure of the port and develops safety and environment management plans to guide our actions.



Figure 3- Various committees of management (Aerial Image: Nearmap 14/09/23)

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The location falls within the Public Park and Recreation Zone (PPRZ) in the City of Greater Geelong Planning Scheme. It is also specifically classified as an 'area of cultural importance'. These areas, as described in the Aboriginal Heritage Regulations 2018, encompass registered sites of Aboriginal cultural heritage and land formations that are typically associated with such heritage. The area holds historical significance and is included in the Victorian Heritage Inventory.

Based on this information, any demolition and rebuild of the pier is likely to require:

- Marine and Coastal Act Consent
- Heritage Consents (or permits)

According to the Greater Geelong Planning Scheme under Clause 36.02, a planning permit to construct a building or construct or carry out works does not apply to a building or works carried out by or on behalf of a public land manager, such as Parks Victoria.

Regional Context

St Leonards is located on the Bellarine Peninsula. Other significant local port areas on the Bellarine Peninsula include Queenscliff Harbour to the southwest and Portarlington Harbour to the northwest. These harbours provide opportunities for sheltered berthing, commercial vessel operations and maritime support and repair businesses. Therefore when considering the reconstruction of St Leonards Pier, it is important to acknowledge the Bellarine area is already serviced by a high level of maritime commercial and berthing infrastructure. Furthermore, St Leonards Pier currently meets a clear demand for a recreational-focused pier that caters for fishing, scuba-diving, snorkelling and walking.

Mooring grounds managed by Parks Victoria on the Bellarine other than St Leonards include:

- Queenscliff (11km)
- Queenscliff West (11km)
- Queenscliff Ferry (11km)
- Swan Bay (8km)
- Edwards Point (2.5km)
- St Leonards North (1km)
- Indented Head (4km)
- Point Richards (10km)
- Portarlington (8km)
- Sands Caravan Park (28km)
- Seabrae (30km)

3 Pier History

The township of St Leonards has a rich history that dates to 1850 when it was known as St Leonards-on-the-Bay. Originally established as a village reserve, the township was based on the efforts of Captain George Ward Cole who set up a thriving fire-wood trade in 1855 and established the settlements of St Leonards in 1857 for timber workers.

The pier was first constructed as a jetty in either 1857 or 1858. Literature states that by 1858, the St Leonards Hotel had been constructed and from that point onwards, the township was focused on “the jetty and the pub”. In 1859, the jetty was primarily used for shipping timber, and extended a substantial distance into the sea and featured a tramway. Its endpoint was marked by a two-decked hulk, partially embedded in the sand and encircled by a breakwater, creating an excellent landing spot (Bryce Raworth, 2023).

In 1867, the jetty had reached a state requiring repairs. Captain Cole declined to further invest in it and expressed his willingness to transfer the control of the jetty to the shire council or the government. This transition of responsibility for the maintenance and restoration of the jetty were confirmed as the government awarded a contract for repairs in 1869. By 1886, the original straight alignment of the jetty now also featured an arm extension and a small shed (refer to Figure 5). In 1908, the L-shaped timber structure had a breakwater constructed which was reconstructed again in 1976.

In 1957, the concrete approach was constructed as part of ongoing improvements. Then again in 1986 came another addition - an outer arm designed to increase practicality and efficiency. The present fabric of the pier bears little resemblance to its original (refer to Figure 5) due to changes in materiality. There was a shed in the middle of the pier (refer to Figure 6), however the shed together with the timber approach extension was demolished in 1986 and reconstructed in 1987 (refer to Figure 7).

The pier remains an integral part of St Leonards township, reflecting the locality's reliance on maritime activities. The current structure, in use today, has undergone complete reconstruction in both 1957 and 1986, as reported by Bryce Raworth in 2023. The predominant character of the pier's fabric is modern, with the associated shed also being a post-war addition. The acknowledgment that the fabric of both the pier and shed are not historically significant suggests that any pier reconstruction should focus on functional aspects rather than current architectural or heritage value.



Figure 4- St Leonards, Robert Bruce ca. 1870 (Source: SLVIC)

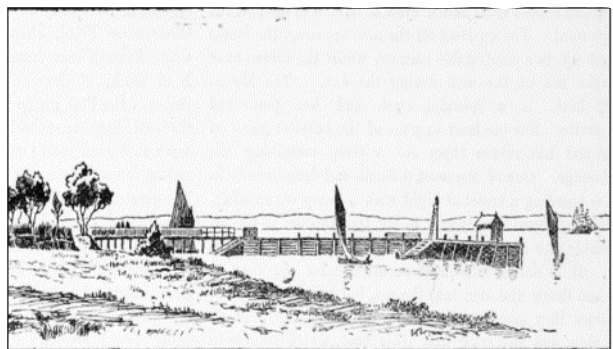


Figure 5- Detail of wood engraving of St Leonards, 1886 (Source: SLVIC)



Figure 6- A view from the Pier St. Leonards ca. 1920-1954 (Source: SLVIC Rose Stereograph Co.)

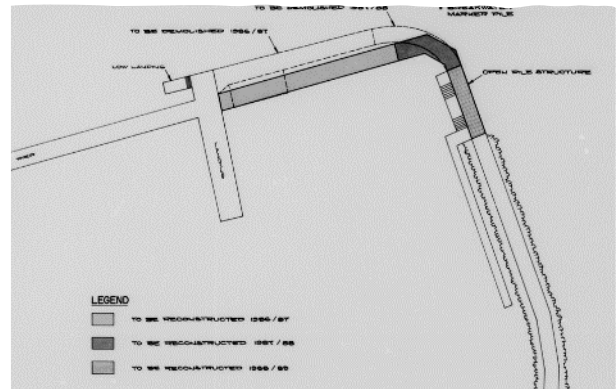


Figure 7- St. Leonards previous layout 1986-1988 (Source: Parks Victoria)

Marine Archaeology

St Leonards has significant maritime archaeological deposits or features that are also associated with the pier. The Victorian Heritage Register (VHR) lists two places with historic shipwreck *St George* (S649) at coordinates -38.170297 and 144.719836 as well as Coles Jetty, St Leonards (H7821-005).

Harvey Maritime conducted a heritage impact assessment for St Leonards Pier which determined significant findings regarding the shipwreck site of the *St George*. Contrary to previous assumptions, the wreck is not that of the *St George* but a smaller, potentially more archaeologically significant vessel, likely constructed in India. Additionally, remnants of the original Coles Jetty were identified within the footprint of the present pier.

The assessment identified mitigation measures to be considered in relation to the demolition of the existing pier. The main risk is considered to be the removal of existing pier piles, which could potentially disturb the archaeological remains of the original jetty and the associated historic shipwreck. The proposed mitigation measures included cutting-off the existing concrete piles at seabed level, lifting piles clear of the seabed upon removal, providing maritime archaeological training for contractors, establishing no anchoring zones around sensitive areas, and planning demolition activities to minimise impacts on the seabed from plant and equipment.

4 Existing Conditions

Local Port Features

The pier is the focal point of the township and currently supports activities such as fishing, scuba-diving, snorkelling, swimming, walking, socialising, alongside berthing and moorings for the local community and visitors. The pier is approximately 200m long and comprises a mix of materials and decking surfaces as the structure has been replaced and extended over time. The key components of the pier are outlined in Table 1.

Table 1 – St Leonards Pier Key Components

	Year Constructed	Decking	Substructure	Piles
Main pier approach	1957	Concrete	Concrete	Concrete
Main pier extension	1986	Timber	Timber	Timber and Concrete
Northern arm	1986	Timber	Timber	Timber
Northern low landing	1986	FRP	Timber	Timber
Southern arm	1957	Concrete	Concrete	Concrete
Eastern finger jetty	1986 and 2011	FRP	Timber	Timber
Eastern low landing	1986 and 2011	FRP	Timber	Timber
Breakwater	1976	Rock		

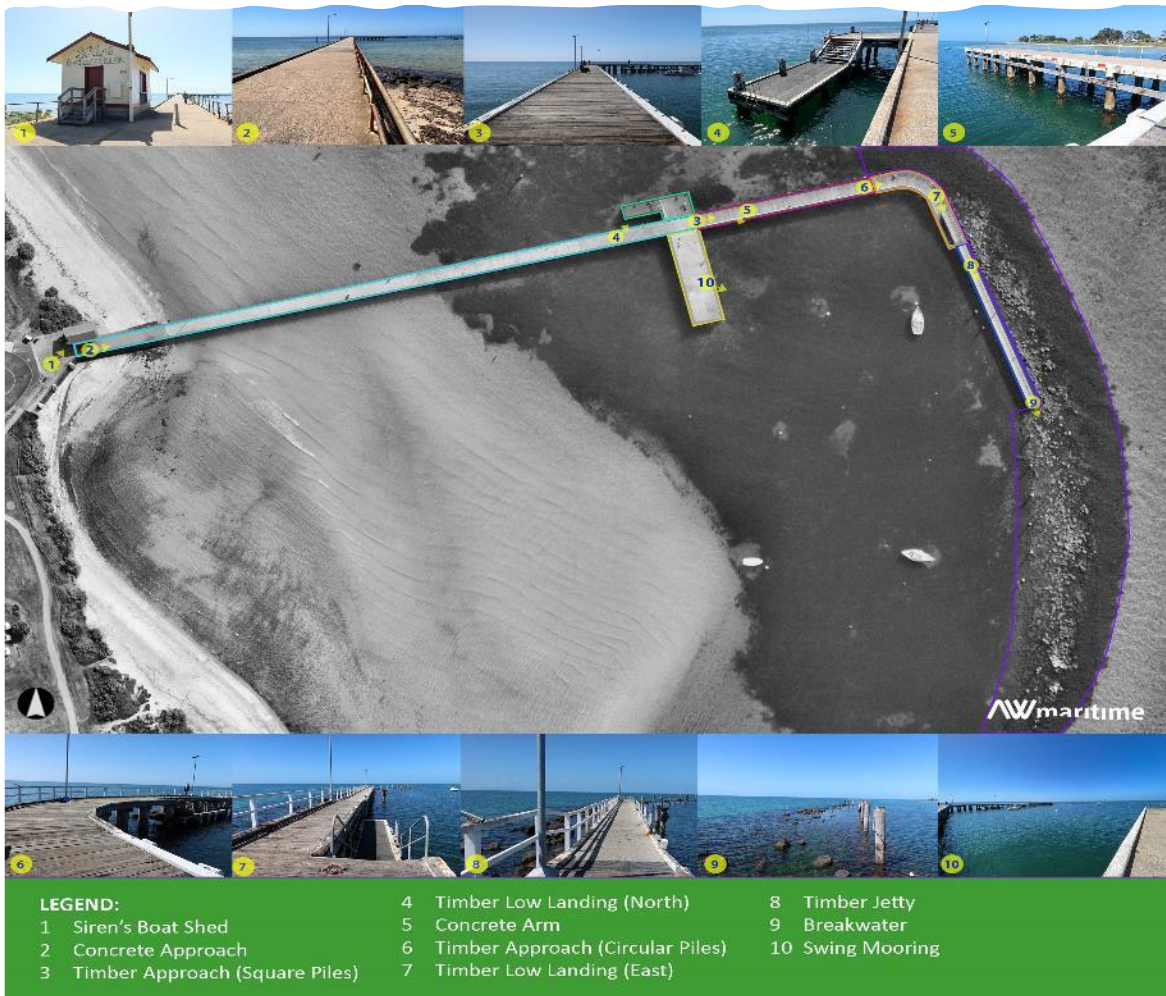


Figure 8- Existing conditions of St Leonards Pier

Condition Assessment

The most recent condition assessment of the pier was the structural visual investigation inspection report (Cardno, 2021). The condition inspection comprised above water and below water (diving) inspections. Cardno concluded overall that the pier was in poor condition and the most critical component was found to be the concrete crossheads. Parks Victoria continues to monitor the condition of the pier to ensure it remains safe for public access.

Pier Use

The pier currently supports activities such as fishing, scuba-diving, snorkelling, swimming, walking, socialising, alongside berthing and moorings for the local community and visitors.

Fishing is a key recreational pursuit on the pier. The full extent of the pier is utilised as different species are targeted including snapper, flathead, whiting and squid.

Locals consider St Leonards to be one of the best shore-accessible scuba-diving sites in Victoria with divers and snorkellers entering the water from the beach north of the pier. The best scuba-diving sites were reported to be concentrated around the timber piles, rock breakwater and underwater rock pile.

Swimmers are encouraged to swim off the beach and north of the pier with a dedicated no boating zone delineated by special marks.

The St Leonards Pier Berthing Map (refer to Figure 9) shows that short-term berthing is allowed for 30-minutes for loading and unloading at both low landings. The short-term berths are typically used by recreational power vessels who visit St Leonards on day trips. There is permit-only berthing on the eastern side of the concrete arm.

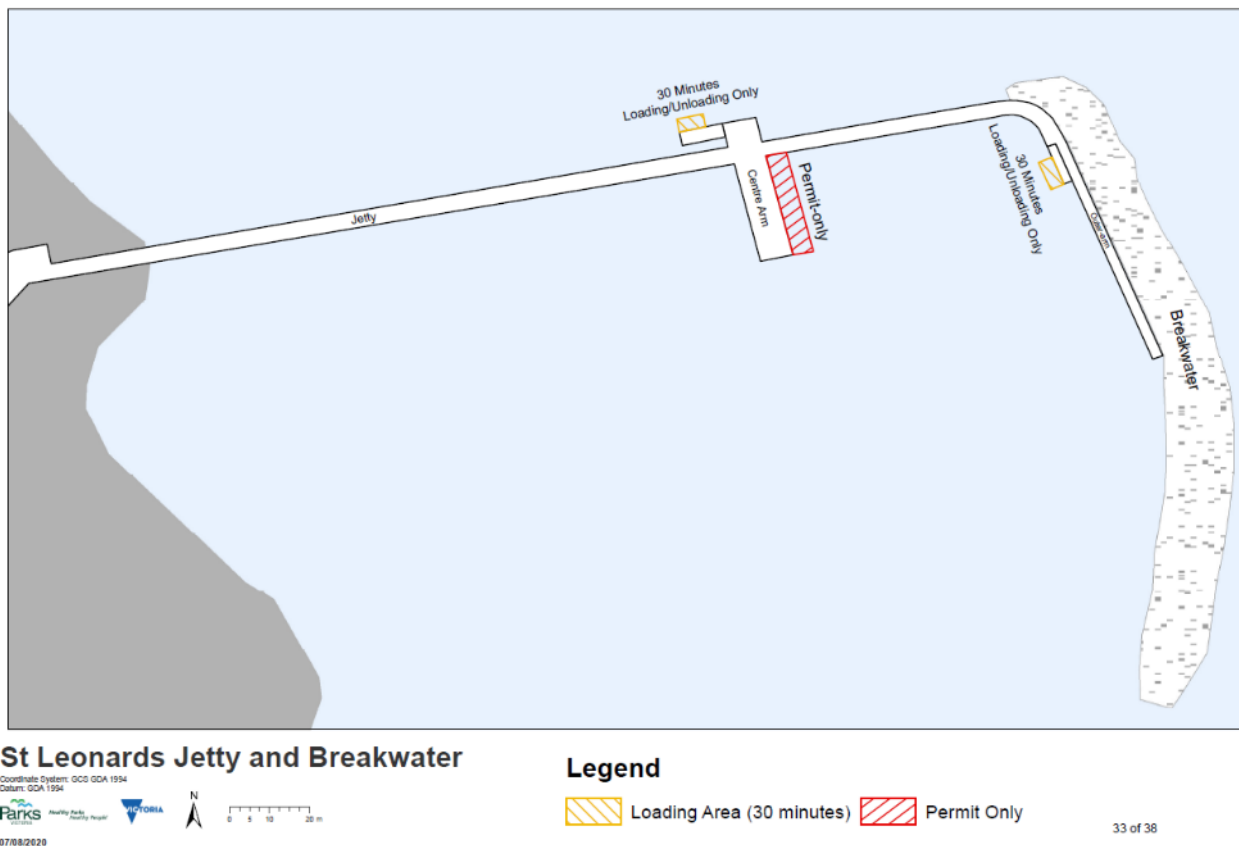


Figure 9- St Leonards Pier Berthing Map (Parks Victoria, August 2020)

Features of the Pier and Breakwater

The fisherman's shed has been part of the pier entrance since it was constructed in 1957 (Bryce Raworth, 2023). The building has a footprint of 20m² and is currently operated as a kiosk under a lease administered by Bellarine Bayside.

The **main pier approach** is approximately 128m long and was constructed in 1957. A shipwreck is located approximately 7m north of the main pier approach and roughly 40m from the shoreline.

The alignment of the **main pier extension** has undergone significant changes over time. Initially, it was connected to the northern timber arm before being demolished and realigned to the main pier approach in 1987-1988. Divers report the marine life is prolific around the timber piles in this section of the pier.

The **northern arm** is made of timber piles and timber decking connected from the main pier concrete approach. The northern arm is a popular spot for recreational fishing when divers are not in the water. Connected to the northern arm is the **northern low landing**. This area can be congested during peak times, and this has led to safety concerns from a conflict in uses.

The **southern concrete arm** was constructed in 1957 at the same time as the concrete approach. It is a high landing located adjacent to the end of the main pier. This arm provides alongside permit berthing on one side.

The **eastern finger jetty** is located at the end of the pier along the crest of the breakwater. The **eastern low landing** is accessed via stairs from the eastern finger jetty.

The **rock breakwater** is on the offshore side of the timber finger jetty. This breakwater was built to provide sheltered waters and create a harbour suitable for berthing and mooring. The breakwater is currently in poor condition with varying crest height and has shown signs of slumping over time. The rock breakwater has developed into an important artificial reef which adds to the attractiveness of the area for scuba-diving and snorkelling.

The pier has mains power supply, which is used for pedestrian lighting, Parks Victoria is in the process of installing solar powered lighting and disconnecting power services to the pier.

Swing Moorings

The swing mooring ground is situated in the lee of the breakwater and on the southern side of the pier. Currently, there are 13 swing moorings in the vicinity.

Considerations for the swing moorings:

Dredging Requirement: periodic dredging (around each 10 years) is undertaken to ensure the depth of water is suitable for accommodating vessels on swing moorings. It was last dredged in 2014. The bathymetric survey conducted in December 2023 by Farren Group shows that the depth in the harbour ranges from approximately -1.0m to -2.0m Chart Datum (CD). The design dredge level for St Leonards is -2.5m Chart Datum. The current depth may be insufficient to provide adequate clearance for vessels.

Safety Concerns for Divers: Divers and snorkellers using the harbour area may face some risk of colliding with swing moorings or vessels.

Wave Protection: The breakwater provides some level of protection to vessels moored in the harbour, however, its effectiveness will further reduce over time as it continues to slump.



Figure 10- Existing swing mooring ground (Parks Victoria, January 2019)

Bathymetric Survey

The most recent bathymetric survey was completed in December 2023 by Farren Group. It revealed the existence of a deeper channel (depth exceeding -2.9m Chart Datum (CD) on the northern side of the pier. Additionally, the depth of the swing mooring area fluctuates between -1.0m and -2.0m CD, which is considered relatively shallow for a mooring ground.

The survey also shows the continuing presence of a sand spit off the beach which has developed in the lee of the breakwater and narrows the harbour width and prevents vessels from navigating too close to shore.

The depth outside the pier near the northern arm and low landing area ranges from -2.6 to -2.9m CD. Along the outside of the rock breakwater, there is a consistent depth of -2.5m to -2.7m CD, which gradually increases to a depth of -4.0m further offshore.

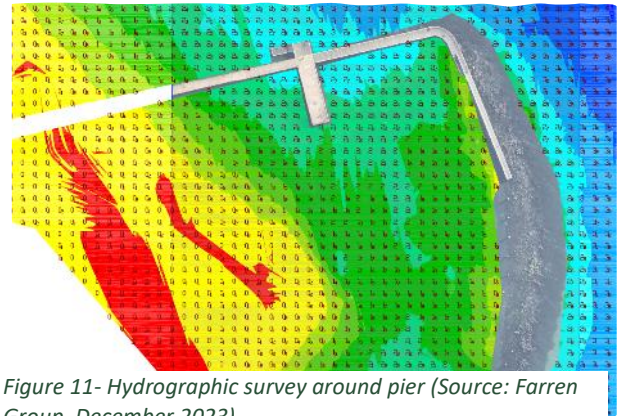


Figure 11- Hydrographic survey around pier (Source: Farren Group, December 2023)

Navigation

Vessel access is currently provided on both the north and south sides of the pier. On the north side, there is a designated swimming zone delineated by special marks. This effectively creates a channel into the low landing with an approximate width of 40m narrowing to 20m width. There is also an underwater rock pile on the northern side of the pier, however the depths in the recent survey are around -2.8m CD so it may not present a navigational hazard. On the southern side, the harbour entrance is marked by a starboard lateral mark on the southern end of the breakwater. There are no defined channels to the pier berthing areas.

Depending on the final design for the pier rebuild, additional navigational markers may be required to mark the underwater rock pile (isolated danger) and the northern end of the breakwater (north cardinal).



Figure 12- St Leonard Pier Boating and Swimming Zones (Source: Parks Victoria, 2015)

Coastal Process and Sedimentation

The St Leonards coastline has shown that it is highly dynamic compared to other areas in Port Phillip. The beach's north-south orientation leads to seasonal longshore transport, which is influenced by waves generated by southerly winds in summer and northerly winds in winter. Previous studies have found that there is net sediment movement from north to south at St Leonards, primarily due to dominant waves generated by winter winds moving from north to north-east (AME, 2013).

The sand at St Leonards is relatively fine based on the previous experience and previous study by AW Maritime (2018). This suggests the cross-shore transport of sand may result in substantial quantities being carried offshore during storm events leading to erosion of the beach. The shape of the beach is regularly altered by waves as they approach the shore. This happens because the characteristics of each individual wave change frequently and are never constant over a long period of time.

Sea Level Rise (SLR)

The Victoria Coastal Strategy (Victorian Coastal Council 2014) recommends consideration of sea level rise in accordance with the following:

- 0.2 metres by 2040
- 0.4 metres by 2070
- 0.8 metres by 2100

The *Marine and Coastal Policy 2020* requires designers to design for sea level rise of not less than 0.8 metres by 2100, and to allow for the combined effects of tides, storm surges, flooding, and coastal processes when assessing coastal hazard risks. Consistent with this policy, the sea level rise scenarios presented in Table 4 should be considered for the pier. The term storm tide refers to coastal water levels produced by the combination of astronomical and meteorological ocean water level forcing. The meteorological component of the storm tide is commonly referred to as storm surge and collectively describes the variation in coastal water levels in response to atmospheric pressure fluctuations and wind setup.

Estimates of extreme coastal water levels have been developed for Port Phillip by the CSIRO (2009) for various planning and sea level scenarios at Queenscliff which is the closest reference point 22km from St Leonards. The levels were based on a 1% Annual Exceedance Probability (AEP) (1-in-100 year) modelling. The storm tide levels for Queenscliff have been adopted for this study and are based on the climate change scenario which combines sea level rise (IPCC 2007 A1F1) with an increase in wind speeds. Table 4 shows that the current level of the pier is above the predicted mean sea level (MSL) for a 1% AEP scenario in 2100 (CSIRO 2009).

Table 4 - Key Levels of St Leonards Pier with Sea Level Rise Scenarios

	Australian Height Datum (AHD)	Chart Datum (CD)
St Leonards main deck	3.00m	3.52m
St Leonards northern low landing	1.26m	1.78m
St Leonards eastern low landing	1.38m	1.90m
Mean Seal Level (2100)	2.33m	2.854m
Mean Seal Level (2070)	1.93m	2.45m
Mean Seal Level (2030)	1.46m	1.98m
Mean Seal Level (2019)	1.23m	1.75m

Metocean Conditions

The wave conditions in Port Phillip originate from wind-generated waves. During summer, the wind at St Leonards comes predominantly from the south to northeast directions. During winter, when the wind is stronger, the wind comes predominantly from the north and the northwest. AWM previously completed a coastal study for St Leonards providing design wave parameters based on modelling at St Leonards (2018). The results are shown in Table 5.

Table 5 – Design Wave at St Leonards (AWM, 2018)

Annual Exceedance Probability (AEP)	Significant Wave Height Hs (m)	Peak Period Tp (s)
2%	2.1	5.4
1%	2.2	5.5
0.5%	2.4	5.6

Marine Ecology

Consulting Environmental Engineers (CEE) completed a marine ecology survey at the pier in November 2023. The analysis of underwater observations made around the timber piles indicated these structures offer a habitat for a diverse range of typical marine organisms. The findings show that the section of piles facing away from the jetty were characterised by a dense cover of algal species, whereas shaded piles facing inward or below the main deck had much less algal cover but with a greater proportion of invertebrate species.

There was a variability in cover between the piles, some are dominated by *Ecklonia radiata*, *Caulerpa brownie*, *Caulerpa remotifolia* or *Ulva lactuca*, whereas other piles had a mixture of macroalgal species. *Ecklonia radiata*, a kelp, thrives on numerous rocky reefs along the Victorian coastline. The top section of piles were a narrow band of the serbulid polychaete, *Galeolaria caespitosa*, blue mussels (*Mytilus planulatus/galloprovincialis*) and a range of macroalga (e.g. *Ecklonia radiata*). These seaweeds play the role of self-sustaining organisms, nurturing a diverse array of life forms, large and small (Parks Victoria, 2023).

Shaded sections of the piles are currently dominated by a range of species including ascidians, bryozoans, sponges, hydroids and bivalve and gastropod molluscs. Other common species present were the gastropod *Dicathais orbita*, the crab *Plagusia chabrus* and the seastar (*Uniophora granifera*).

The presence of marine pests in the area is restricted to only one species, the kelp *Undaria pinnatifida*.

The basalt rocks forming the breakwater not only contribute to a reef-like structure but also serve as a thriving habitat for common kelp, along with other large brown macroalgae. This environment supports a diverse community of invertebrates and fish. Although these rocks and the breakwater structure contribute to the overall habitat for a variety of marine flora and fauna, it is less likely that they would offer significant support to any threatened or listed species under the *Flora and Fauna Guarantee Act 1988* found in this specific region of the bay.

CEE reported that the removal of piles poses low overall risks to Protected Aquatic Biota, while the associated risks with disturbance to the rock are reported to be high.

In the context of the pier rebuild, minimising the disturbance to the *Heterozostera nigricaulis* seagrass is necessary and will need to be considered in Marine and Coastal Act 2018 applications for any proposed dredging and pier work, as the Flora and Fauna Guarantee Act designates this species as threatened. The key consideration is to avoid disruption or shading of the existing seagrass meadow. To address potential light reduction, particularly during the growing season, trigger-based responses are necessary for sediment suspension during demolition, construction, and dredging. Recognising its ecological significance, strategic design of vessel moorings, berths, and access channels is necessary to minimise impacts on the seagrass meadow.

5 Economics and Demand Analysis

Demographics

The 2021 Census shows that the population in St Leonards was 3,542, an increase from 2,480 in 2016. St Leonards is characterised by a mature demographic, with a median age of 56 years, indicating a predominant population of older residents. This demographic suggests a potential demand for significant community and social services tailored to the needs of this age group (ABS, 2021).

The employment rate is 1,444 (45.9%) out of 3,147. The occupational landscape of St Leonards is diverse, with professionals leading the workforce at 250 individuals (18%), followed closely by technicians and trades workers at 225 (16.4%), the managerial sector comprises 175 individuals (12.8%), while 167 (12.2%) community and personal service workers contribute to social wellbeing. The workforce is further complemented by 142 labourers (10.3%), 109 sales workers (7.9%), and 81 machinery operators and drivers (5.9%) (ABS, 2021).

Commercial Operators

The pier supports several businesses and Licensed Tour Operators (LTOs) directly through the structure itself or indirectly by the environmental values of the marine ecology underneath the pier. They include:

- Sirens Boathouse and Kiosk operator
- Bay City Scuba
- Scubabo Dive
- Snorkel and Dive Safari Altona
- Eco-Logic Education and Environment Services

Tourism

Visitors to the Bellarine Peninsula (75%) are more likely to visit the beach than similar coastal locations, such as Mornington Peninsula (54%) and Phillip Island (62%).

Bellarine North, where St Leonards, is located has an overnight visitor market of 566,741 visitors and day trip visitation around 274,964 visitors per annum, with most of these visitors staying in holiday homes or camping. Data for the Bellarine Peninsula shows that it attracts much higher levels of holiday leisure visitation than urban Geelong. The top five activities undertaken with overnight trips include:

- going to the beach (75%),
- eat out/dine at a restaurant and/or café (66%),
- visit friends and relatives (49%),
- sightseeing/looking around (42%), and
- visit wineries (11%).

Future Demand and Commercial Opportunities

St Leonards envisions a future that supports a dynamic mix of retail, commercial, community, and entertainment establishments within its town centre. The integration of the town centre and pier-foreshore area stands as a core goal to foster a cohesive and vibrant community space in the years to come (City of Greater Geelong, 2022). The pier holds maritime historical value and has played a crucial role in the development of the St Leonards township. Today, the pier serves as a prominent waterfront focal point, offering locals and tourists opportunities for recreational activities. Therefore, AWM believes the potential opportunities for Parks Victoria to consider include:

- Rehabilitation of the pier for public safety
- Ensuring the pier continues to provide for fishing and scuba-diving
- Acknowledgement of the pier's importance in development of St Leonards (e.g. signage and story telling)
- Utilisation of the sheltered waters on southern side of the pier for paid activities, such as non-motorised watercraft hire, kayaks, stand-up paddle boards
- Creating a map or trail for divers and snorkellers involves several key steps to ensure a safe and enjoyable underwater experience
- Installation of an artificial reef to further enhance marine life and scuba-diving opportunities.

6 Stakeholder and Community Insights

Consultation Overview

A project reference group has been established to guide this plan. It comprises of representatives from Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC), the Department of Transport and Planning, Parks Victoria, Bellarine Bayside Foreshore Committee of Management (Bellarine Bayside), the City of Greater Geelong and Department of Energy, Environment and Climate Action (DEECA).

Stakeholder and community input is being sought at key stages in the development of this plan.

- Stage 1: October 2023. Key stakeholders and user groups were engaged to gather insights around current issues and ideas to help inform a draft plan
- Stage 2: March 2024. The wider community will be invited to view the draft plan and provide feedback to inform a final plan.

Stakeholder Consultation (Stage 1)

Key stakeholders and user groups consulted during Stage 1 were:

- Swing mooring permit holders
- Recreational fishers
- Licensed tour operators (LTOs)
- Sirens Boathouse & Kiosk tenant
- St Leonards Progress Association
- VRFish
- The Boating Industry Association
- Better Boating Victoria
- The Bellarine Catchment Network

The stakeholder views from this consultation provided their opinions and identified several challenges and opportunities related to the on-water components of the pier including:

Fishing

- There should be a platform constructed over the rock breakwater to enable people fishing to safely access this area and to land fish.

Scuba-Diving/Snorkelling

- The rock breakwater should continue to be accessible, and its values protected, to continue to support scuba-diving and snorkeling.
- Any new pylons should have a rough surface to promote attachment by marine plants and animals.
- The pier should have stairs at the deep end to allow people swimming or snorkeling to easily climb out of the water.
- Artificial reefs should be placed in the deeper water for advanced scuba-diving.
- Fishing should be limited to allow marine biodiversity to flourish.

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- Spider crabs should be protected from predation by fishers and divers during their moulting season.
- Monitor the spread of urchin barrens in the area.

Boating

- Long-term berths should be provided instead of swing moorings, as this would enable people to more easily and safely board and disembark from their vessels.
- The breakwater does not sufficiently block rough seas.
- Sand accumulating in the harbour is restricting the maneuverability of vessels using the moorings.
- Swing moorings should accommodate larger vessels (e.g. 9-10m yachts).

Community Consultation (Stage 2)

Stage 2 is to seek wider community feedback and comment on this draft plan to inform decisions around the options proposed for the pier.

Parks Victoria Challenges

In addition to the challenges identified through the stakeholder process, Parks Victoria has identified the following challenges with the structure based on its experience as a local port manager. The following is the summary of the key discussion points:

- Minimise conflict of user groups at particular locations on the pier
- Ensure the environmental values of the pier, breakwater and adjacent waters are maintained
- Discourage jumping off the pier into the surrounding waters
- Assess the costs and benefits of continuing to dredge the harbour
- Refrain from undertaking any extensive work on the breakwater, especially if it poses a risk to its existing role in supporting the environmental values.

Parks Victoria Considerations

Parks Victoria has identified objectives for the reconstruction of the pier. With the current pier in poor condition and the remaining serviceable life limited, funding has already been committed by the Victorian Government for the demolition of the existing pier and reconstruction of a new pier. The objectives are:

Integration with broader context

- Integrate the plan with the surrounding marine and coastal environment context.
- Integrate the plan with planning for the adjoining area managed by Bellarine Bayside.

Vehicle access

- Provision for light weight maintenance vehicle access only, noting that the focus for future pier use is on pedestrian access only.

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Visitor experience

- Provide an excellent visitor experience.
- Support current and ongoing primary uses of promenading (walking) and recreational fishing.

Pedestrian access

- Explore opportunities to enhance pedestrian access from the land side to the pier, considering the topographical shift from the car park to the pier. This may involve altering vehicle movements on the land side and ensuring *Disability Discrimination Act 1992* (DDA) compliant access onto the pier.

Dredging

- Review maintenance dredging in the harbour in light of environmental (e.g. listing of sea grass) and cost factors and identify likely impacts on harbour use and coastal processes without dredging.

Waste management

- Improve waste management (e.g. consider removing bins from on the pier, moving land-side bins further away from pier).
- Working with key agencies (e.g. Victorian Fisheries Authority) to improve education/behavioural changes to waste.

Managing impacts

- Understand and avoid any impacts on foreshore coastal processes as a result of design or placement of new pier.
- Avoid impacts on environmental values of the breakwater and other areas around the existing pier structure (to be informed by future environmental assessments).

Sustainable design

- Understand current and future demand to inform the function of the pier and provide advice to land managers on potential impacts on adjacent land (e.g. capping car park capacity), achieving sustainable overall site management.
- Identify how climate change impacts should inform future asset design and function.
- Ensuring the design for a new pier considers the cost benefit between the capital and operational costs in achieving a 50-year asset design life, through the use of appropriate materials and design.

Supporting economic activity

- Identify opportunities to continue supporting current economic activity (e.g. licensed tour operators), and any future demands identified.

Pier design

- Consider the visual aesthetic of the new pier.
- Consider the ability to change alignment of the new pier (e.g. to align with Murradoc Road and to avoid the rock breakwater).

7 Existing Issues

Existing Issues

Following the existing condition review for the on-water component of the harbour, AWM has identified the following existing issues in the harbour to be addressed in this plan. These issues are addressed in the future demand and proposed concept options in the next section.

Issue 1: Observed deterioration of concrete and timber piles, balustrades, timber capping, timber decking, bollards, etc.

Issue 2: Potential conflict among different user groups (fishing, scuba-diving, snorkelling, walking, and commercial operations) at times of high visitation.

Issue 3: Minimal wave protection due to slumped breakwater

Issue 4: No ramp access to low landings

Issue 5: Dredging is required to maintain use of swing moorings and harbour for a small number of vessels

Issue 6: No defined navigation channel on the inner area of the pier

Issue 7: Operational challenges because of the varying depths of water



Figure 13- St Leonard Pier existing issues (Aerial Image: Nearmap 14/09/23)

8 Future Demand and Design

Design Criteria

Following an understanding of the new pier objectives, design criteria have been outlined and listed below to address existing issues. This information will be used for all concept options:

- St Leonards Pier Use
 - Ensure LTOs and recreational users are catered for at the new pier.
 - Accommodate different activities (fishing, scuba-diving, swimming and snorkelling) to encourage sustainable activation.
 - Avoid or minimise impacts on the Sirens Boathouse and Kiosk building.
 - Ensure the heritage and environmental values of the pier and breakwater and adjacent waters (including the shipwreck) are maintained or enhanced.
 - Ensure any cultural and/or heritage values of the current pier are protected.
 - Consider realignment of the pier with the main street.
 - Ensure the pier levels are suitable for climate change and sea level rise scenarios.
- Access
 - Provide Parks Victoria maintenance vehicle access only.
 - Consider the changing topography from the carpark to the pier and how this may impact on pedestrians.
 - Compliance with Disability Discrimination Act 1992.
- Services
 - No services such as water, power or communications are required on the pier.
 - Solar lighting.
- Berthing
 - No permanent permit berthing to be provided at St Leonards.
 - Provide short-term berthing (low landing).
 - Assess the mooring ground considering environmental values and other factors.
 - Ensure all channels meet the requirements of Australian Standards AS3962 (2002) *Marina Design* based on the design vessels for each area.

Concept Options

Two concept options have been prepared for the community to provide feedback. The two options are shown in Figure 14 and 15. A preferred concept will be developed following public feedback and included in a final plan. Both options involve the demolition of the existing pier at, or close to, the pier abutment.

Option 1

The proposed design Option 1 will retain the existing alignment of the pier extending from the foreshore. It has a circular platform at the end for people to walk around and fish in all directions. It allows for berthing of up to two 12m vessels alongside a low landing berthing area on the northern side of the pier. A low landing for scuba-diving and snorkelling is also provided on the southern side of the pier. Additionally, this design includes fixed ramps with a slope ratio of 1:14 providing access to both low landings in compliance with DDA regulations.

Based on environmental impact assessment, dredging and the provision of swing moorings are no longer considered sustainable. This option will increase opportunities for non-motorised recreational activities within the harbour.

KEY FEATURES

- 1 Maintain existing pier alignment primarily for pedestrians with maintenance vehicle access
- 2 Circular platform for viewing and fishing in all directions
- 3 Low landing for scuba-diving and snorkelling
- 4 Low landing for berthing
- 5 Fixed ramp at 1:14 slope to enable DDA access to low landing
- 6 Berthing for up to 12m design vessels
- 7 Entrance channel width in accordance with Australian Standards AS3962 (2020)
- 8 Include starboard-handmarks
- 9 No change to rock breakwater

LEGEND

- Existing Breakwater
- Existing Sirens Boathouse
- Existing Bluestone Pier Abutment
- Proposed Pier
- Proposed Berthing Low Landing Area
- Proposed Scuba-Diving Low Landing Platform
- Entrance Channel



Figure 14- St Leonards Pier Concept Option 1 (Aerial Image: Nearmap 14/09/23)

Option 2

The proposed design for Option 2 has the new pier aligned with Murradoc Road and will extend from the foreshore. It allows for berthing of up to two 12m vessels alongside the low landing berthing area on the northern side of the pier. A low landing for scuba-diving and snorkelling is also provided. Additionally, this design includes fixed ramps with a slope ratio of 1:14 providing access to both low landings in compliance with DDA regulations.

Based on environmental impact assessment, dredging and the provision of swing moorings are no longer considered sustainable. This option will increase opportunities for non-motorised recreational activities within the harbour.



KEY FEATURES

- 1 New pier alignment with Murradoc Road
- 2 Low landing for scuba-diving and snorkelling
- 3 Low landing for berthing
- 4 Fixed ramp at 1:14 slope to enable DDA access to low landing
- 5 Berthing for up to 12m design vessels
- 6 Entrance channel width in accordance with Australian Standards AS3962 (2020)
- 7 Include starboard-handmarks
- 8 Pier designed primarily for pedestrian with maintenance vehicle access
- 9 No change to rock breakwater

LEGEND

- Existing Breakwater
- Existing Sirens Boathouse
- Existing Bluestone Pier Abutment
- Proposed Pier
- Proposed Berthing Low Landing Area
- Proposed Scuba-Diving Low Landing Platform
- Entrance Channel



Figure 15- St Leonards Pier Concept Option 2 (Aerial Image: Nearmap 14/09/23)

Options Key Feature Matrix

The following table outlines the key features of the two options in relation to the existing pier (base case).

Table 6 – Key feature matrix for each concept options and the existing pier

		Option 1	Option 2	Existing Pier (Base Case)
Proposed New Pier				
	Existing pier alignment	x		x
	New alignment with St Leonards main street (Murradoc Road)		X	
	Pier levels designed for climate change and sea level rise scenarios	x	X	
	Design to minimise impacts to seagrass		X	
	Maintenance vehicle pier access	x	X	
	DDA access to all areas of pier (i.e. no steps)	x	X	
	Seating	x	X	
	Solar lighting	x	X	
Fishing				
	Separate fishing area from other activities	x	x	
	Fishing areas available along main pier approach	x	x	x
Scuba-Diving and Snorkelling				
	Separated scuba-diving area from other activities	x	x	
	Scuba-diving platform located near dive site	x	x	x
	Access to water via scuba-diving ladder	x	x	x
Berthing				
	Provision of short-term berthing	x	x	x
	Separated berthing area from other activities	x	x	
	Berthing alongside at pier level			x
	Berthing alongside low landing	x	x	x
	Channels and fairways meet requirements of AS3962 (2020)	x	x	

9 References

Reports

No.	Title	Author	Date
1	St Leonards Condition Assessment	AW Maritime	May 2017
2	St Leonards Pier- Structural Visual Investigation	Cardno Victoria Pty Ltd	July 2021
3	St Leonards Jetty Electrical Condition Assessment	Hyder Consulting Pty Ltd	May 2010
4	St Leonards Pier Structural Concrete and Steel Condition Assessment- Portion B- Draft	Hyder Consulting Pty Ltd	September 2011
5	St Leonards Jetty Structural Timber Condition Assessment Portion A- Draft	Hyder Consulting Pty Ltd	May 2012
6	Southern Divers St Leonards Pier Pile Inspection Report 2021	Southern Divers Pty Ltd	May 2021
7	Heritage Information: Piers and Jetties of Port Phillip	Robin Crocker & Associates	July 2004
8	Background Report- North Bellarine Beach Nourishment	Department Environment, Land Water and Planning	February 2021
9	Sustainable Local Ports Framework	The State of Victoria Department of Transport	
10	Marine and Coastal Policy	Victoria State Government	March 2018
11	Adopted St Leonards Structure Plan	The City of Greater Geelong	March 2015
12	Boating and Swimming Zones are Changing for the Better	Parks Victoria	June 2015
13	Northern Bellarine Coastal and Marine Management Plan	Bellarine Bayside Coastal Management	December 2019
14	The Effect of Climate Change on Extreme Sea Levels in Port Phillip Bay	McInnes K., O'Grady J. & Macadam I. CSIRO Marine and Atmospheric Research	November 2009
15	Inundation Report: Bellarine Peninsula- Corio Bay Local Coastal Hazard Assessment	Cardno Victoria Pty Ltd	December 2015
16	Marine and Coastal Act 2018	Victoria State Government	2020
17	Marine and Coastal Strategy	Victoria State Government	2022
18	Greater Geelong and Bellarine Tourism Development Plan Final Report 2019-2022	Urban Enterprise	February 2019
19	St Leonards (vic.) 2021 Census All Persons QuickStats	Australian Bureau of Statistics	2021
20	Saving Victoria's ecological anchors of the sea	Parks Victoria	June 2023
21	St Leonards Pier Marine Ecology Survey & Pier Renewal Considerations - Draft	CEE Pty Ltd	December 2023
22	Heritage Review St Leonards Pier	Bryce Raworth	January 2024
23	Heritage Impact Assessment- Draft	Harvey Maritime	February 2024

Figure and Photo Credits

Figure No.	Title	Source Image	Date
1	Figure 1- Location of St Leonards Pier (Source: Melway Map 460)	Melway Map 460	
2	Figure 2- St Leonards Pier study area and context map of Port Phillip (Aerial Image: Nearmap 14/09/23)	Nearmap	14/09/23
3	Figure 3- Various committees of management (Aerial Image: Nearmap 14/09/23)	Nearmap	14/09/23
4	Figure 4- St Leonards, Robert Bruce ca. 1870 (Source: SLVIC)	SLVIC	1870
5	Error! Reference source not found.	SLVIC	1886
6	Figure 6- A view from the Pier St. Leonards ca. 1920-1954 (Source: SLVIC Rose Stereograph Co.)	SLVIC	1920-1954
7	Figure 7- St. Leonards previous layout 1986-1988 (Source: Parks Victoria)	Parks Victoria	1986-1988
8	Figure 8- Existing Conditions of St Leonards Pier	AW Maritime	2023
9	Figure 9- St Leonards Pier Berthing Map (Parks Victoria, August 2020)	Parks Victoria	2020
10	Figure 10- Existing Swing Mooring Ground (Parks Victoria, January 2019)	Parks Victoria	2019
11	Figure 11- St Leonards Public Boat Ramp, October 2023	AW Maritime	2023
12	Figure 12- Hydrographic Survey around Pier (Source: Farren Group, December 2023)	Farren Group	2023
13	Figure 13- St Leonard Pier Boating and Swimming Zones (Source: Parks Victoria, 2015)	Parks Victoria	2015
14	Figure 14- St Leonard Pier Existing Issues (Aerial Image: Nearmap 14/09/23)	Nearmap	14/09/23
15	Figure 15- St Leonard Pier Concept Option 1 (Aerial Image: Nearmap 14/09/23)	Nearmap	14/09/23
16	Figure 14- St Leonard Pier Concept Option 2 (Aerial Image: Nearmap 14/09/23)	Nearmap	14/09/23

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