

2.4.1 Impact Table - direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat

Species	Impact
Terrestrial Flora	
<p>Dense Leek-orchid (<i>Prasophyllum spicatum</i>)</p>	<ul style="list-style-type: none"> • EPBC Act – Vulnerable • FFG Act – Listed • Victorian Advisory List – Endangered <p>Only around 80 individuals of this species are known from around eight populations ranging from south Gippsland (Wonthaggi) to the far southeast of South Australia (Duncan 2010). Duncan (2010) identifies that two of these populations occur in Crib Point and one in the nearby Stony Point Rail Reserve. Records in the Victorian Biodiversity Atlas (VBA) indicate the Crib Point sites are located at Disney Road (approximately 1 km from the Project Site) and Crib Point Bushland Reserve (approximately 1.7 km from the Project Site). There are numerous records in the VBA that may be attributed to the Stony Point Rail Reserve, including records in the coastal vegetation.</p> <p>Throughout its range, this species occurs in coastal and near-coastal heathland and heathy woodland. This type of vegetation occurs within Heathy Woodland present within an area of 0.5 ha in the southern section of the Project assessment area of the Flora and Fauna Assessment (Attachment 4). Dense Leek-orchid generally occurs on sandy soils, with some sites seasonally waterlogged. Little is known of specific habitat requirements, and some sites have been disturbed by periodic fire or mowing; which has been reported to be required to stimulate flowering (Duncan 2010).</p> <p>This species was not encountered during a survey of the Project assessment area by Jacobs in February 2018, however the survey was not conducted within the flowering season. To minimise the potential to disturb this species, the of 0.5 ha in the southern section has been removed from the land disturbance footprint (as shown in Figure 3). Therefore, no vegetation will be impacted on this section of land Refer to Attachment 4 – Flora and Fauna Assessment.</p>
Terrestrial Fauna	
<p>Australian Fairy Tern (<i>Sternula nereis nereis</i>)</p>	<ul style="list-style-type: none"> • EPBC Act – Vulnerable • FFG Act – Listed • Victorian Advisory List – Endangered <p>The Australian Fairy Tern nests on sheltered sandy beaches, spits and banks above the high-water mark and below adjoining terrestrial vegetation. Although there is some potential for this species to nest in Coastal Dune Scrub along the eastern extent of the landside component (on the cleared land above high-water mark), these areas are typically very small</p>

Species	Impact
	and of low-moderate quality and are not proposed to be impacted by the Project. Refer to Attachment 4 – Flora and Fauna Assessment.
Swift Parrot (<i>Lathamus discolor</i>)	<ul style="list-style-type: none"> • EPBC Act – Critically Endangered • FFG Act – Listed • Victorian Advisory List – Endangered <p>The Swift Parrot prefers open grassy woodland with dead trees, near permanent water and forested hills, coastal heaths, pastures with exotic grasses, weeds, roadsides and orchards.</p> <p>Eucalypts within the patch of Heathy Woodland south of the jetty access road may provide temporary refuge and feeding habitat for this species during its northern migration. However, this area has been excluded from the Project Site and it is unlikely this species would make significant use of this habitat. Refer to Attachment 4 – Flora and Fauna Assessment.</p>
Southern Brown Bandicoot (<i>Isoodon obesulus obesulus</i>)	<ul style="list-style-type: none"> • EPBC Act – Endangered • FFG Act – Listed • Victorian Advisory List – Near Threatened <p>The Southern Brown Bandicoot prefers sandy soil with scrubby vegetation and / or areas with low groundcover that are burned from time to time. Habitat available on the site provides marginal value for this species as dense vegetation below 1 m height is generally absent. This species was formerly recorded in the local area, however there is now doubt as to whether it is still locally present. Targeted surveying previously undertaken (PKA 2016) encompassing the landside component did not identify this species and therefore the Southern Brown Bandicoot is unlikely to be impacted by this Project. Refer to Attachment 4 – Flora and Fauna Assessment.</p>
Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>)	<ul style="list-style-type: none"> • EPBC Act – Vulnerable • FFG Act – Listed • Victorian Advisory List – Vulnerable <p>The Grey-headed Flying-fox typically camps in gullies not far from water and usually in vegetation with a dense canopy. This species may use the assessment area for temporary feeding and breeding, particularly the eucalypts south of the jetty access road however this area has been excluded from the Project Site and therefore is unlikely to be impacted by the Project. Refer to Attachment 4 – Flora and Fauna Assessment.</p>
Marine Species	

Species	Impact
Blue Whale (<i>Balaenoptera musculus</i>)	<ul style="list-style-type: none"> • EPBC Act – Endangered, Migratory • FFG Act – Listed • Victorian Advisory List – Critically Endangered <p>The migration path of the south-eastern Australian population of the Blue Whale has not been documented, however some individuals may pass through central Bass Strait during autumn and spring migrations between the Portland region and the tropics, including past the entrances to Western Port. It is likely that these large whales would pass a considerable distance offshore from the coastline and would not enter the North Arm of Western Port.</p> <p>The Project Site is remote from Blue Whale aggregation areas and plausible migration pathways. The nearest record of this species is for a decayed specimen that washed up on Flinders Beach (whales often drift great distances at sea after death). There are records of sightings offshore from Cape Schanck and east of Wilsons Promontory but none in the vicinity of Western Port.</p> <p>–There are no apparent direct or indirect pathways related to the Project that are likely to affect Blue Whales: population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.</p>
Southern Right Whales (<i>Eubalaena australis</i>)	<ul style="list-style-type: none"> • EPBC Act – Endangered, Migratory • FFG Act – Listed • Victorian Advisory List – Critically Endangered <p>Southern Right Whales are encountered seasonally in Bass Strait, more frequently in western Bass Strait where they calve, and intermittently in central Bass Strait. Southern Right Whales may pass close to the shore all along the central Victorian region, including past the entrance to Western Port. Southern Right Whales have been sighted in Western Port, with two records in the vicinity of Crib Point, but the bay is not known to be an aggregation or breeding area for these whales. The actual number of whales visiting Victoria is a very small fraction of the main population, which over-winters traverse along the coasts of South Australia and Western Australia. The nearest recognised aggregation area of the Southern Right Whale is located near Warrnambool.</p> <p>There are no apparent direct or indirect pathways related to the Project that are likely to affect Southern Right Whales: population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.</p>
Leatherback Turtle (<i>Dermochelys coriacea</i>)	<ul style="list-style-type: none"> • EPBC Act – Endangered, Migratory • FFG Act – Listed

Species	Impact
	<ul style="list-style-type: none"> • Victorian Advisory List - Critically Endangered. <p>The Leatherback Turtle is migratory, travelling thousands of kilometres between breeding and foraging areas, and has a worldwide distribution in tropical, temperate and sub-polar waters down to 10°C. Adults live in ocean habitats and rarely come close to shore in Australia. Breeding occurs on tropical islands throughout the world. Leatherback Turtles feed mostly on pelagic invertebrates such as jellyfish, and Bass Strait has one of the three largest concentrations of feeding Leatherback Turtles in Australia.</p> <p>In Victoria, Leatherback Turtles are most commonly seen between April and May, when the waters of Bass Strait are warmest. Sightings and strandings have been recorded all along the Victorian Bass open coast, Port Phillip Bay and the Gippsland Lakes. There are no records from Western Port, however there have been numerous sightings nearby, including around Port Phillip Heads.</p> <p>The key threat to the species, as for many turtles, is human disturbance of breeding habitats and harvesting of eggs. Leatherback Turtles do not nest in Victoria. Other threats include by-catch in commercial fisheries, and in Victoria the key by-catch threat is entanglement in cray pot buoy lines. Ingestion of marine debris is also a concern, particularly of plastics, as Leatherback Turtles tend to feed along drift lines where debris accumulates.</p> <p>– There are no apparent direct or indirect pathways related to the Project that are likely to affect Leatherback Turtles: population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.</p>
<p>Loggerhead Turtle (<i>Caretta caretta</i>)</p>	<ul style="list-style-type: none"> • EPBC Act – Endangered, Migratory • FFG Act – Not listed • Victorian Advisory List – Not listed <p>The Loggerhead Turtle inhabits primarily tropical and subtropical seas, although they may occasionally occur in south-east Australia in the warmer months. There are two distinct populations in Australia, one which nests along the north-west coast of Western Australia and one that nests on islands and coasts of the southern Great Barrier Reef. Nesting does not occur in Victoria.</p> <p>The key threats are similar to those for Leatherback Turtles and include threats to nesting success and commercial fishery by-catch mortality. Predation of eggs by foxes on mainland beaches is a key problem in Western Australia and Queensland. Mortality as fishery by-catch is a problem throughout their tropical and sub-tropical foraging range, with entanglement in lobster-pot buoy lines, long lines, and ghost nets the key issues.</p> <p>There are 13 records of Loggerhead Turtles in Victoria (Atlas of Living Australia, 2017), the majority of which were recorded on the Victorian coastline west of Melbourne. Seven were of dead specimens and most others were live beach strandings. There are no records from Western Port.</p>

Species	Impact
	<p>There are no apparent direct or indirect pathways related to the Project that are likely to affect Loggerhead Turtles: population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.</p>
<p>Humpback Whale (<i>Megaptera novaeangliae</i>)</p>	<ul style="list-style-type: none"> • EPBC Act – Vulnerable, Migratory • FFG Act – Listed • Victorian Advisory List - Vulnerable <p>Humpback Whales have a worldwide distribution, however central Bass Strait, including Western Port, is generally outside Humpback Whales’ migratory path, and is not a feeding, breeding or calving area. However, individuals or pairs stray into the area from time to time, and there are records of Humpback Whales in Western Port as far north as Crawfish Rock (ALA, 2017).</p> <p>There are no apparent direct or indirect pathways related to the Project that may affect Humpback Whales: population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.</p>
<p>White Shark (<i>Carcharodon carcharias</i>)</p>	<ul style="list-style-type: none"> • EPBC Act – Vulnerable, Migratory • FFG Act – Listed • Victorian Advisory List - Vulnerable <p>The White Shark (also known as the Great White Shark) occurs in all oceans of the world, including Bass Strait and Western Port. The seal breeding colony at Seal Rock at the Western Entrance to Western Port is a known feeding area for White Sharks and these sharks have been caught and observed in Western Port from time to time.</p> <p>White Sharks are highly mobile with vast individual geographic ranges. Individuals typically remain resident in one locality only for periods of days or rarely weeks before moving to another area, according to observations of fishermen, divers and marine scientists.</p> <p>The key threats are commercial fishing, recreational fishing, shark control activities (beach meshing), trade (fins, jaws and teeth) and tourism (FFG Action Statement No. 185). The Project does not involve these threats and is unlikely to have any indirect adverse effects on White Shark populations.– There are no apparent direct or indirect pathways related to the Project that may affect White Sharks: population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.</p>
<p>Green Turtle (<i>Chelonia mydas</i>)</p>	<ul style="list-style-type: none"> • EPBC Act – Vulnerable, Migratory • FFG Act – Not listed

Species	Impact
	<ul style="list-style-type: none"> • Victorian Advisory List – Not listed <p>The Green Turtle is a tropical species of turtle and generally only occurs in waters where temperatures average 20°C or more but may occasionally stray into temperate waters (following warm coastal currents) given its long migration ability. Their preferred habitat is coral reefs with abundant algae and seagrass beds, and adults are herbivorous. There are seven nesting populations in Australia, with all nesting occurring in tropical waters – from the southern Great Barrier Reef, around the Top End to the North West Shelf.</p> <p>There are seven records of Green Turtles in Victorian waters, most of them for dead specimens found on beaches. There is one record of a dead Green Turtle on Reef Island in eastern Western Port.</p> <p>Threats primarily relate to disturbance of nesting and foraging sites, collisions with boats and ships, habitat disturbance and by-catch in fishing operations.</p> <p>– There are no apparent direct or indirect pathways related to the Project that may affect Green Turtles: population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.</p>
<p>Australian Grayling (<i>Prototroctes maraena</i>)</p>	<ul style="list-style-type: none"> • EPBC Act – Vulnerable • FFG Act – Listed • Victorian Advisory List - Vulnerable <p>The Australian Grayling is a small (300 mm long) freshwater fish that has larval and juvenile stages in the marine environment. The Bass River in south-eastern Western Port and the Bunyip River in north-eastern Western Port are the two most significant freshwater inputs to the Bay.</p> <p>Adult populations of Australian Grayling are distributed widely in Victorian coastal rivers and streams between the New South Wales border and the Hopkins River in western Victoria, including streams entering the northwest of Western Port. There appears to be some mixing between larval populations during their marine phase (Crook et al, 2006). It is possible that larvae and juvenile Grayling disperse and migrate between freshwater streams in Western Port and Bass Strait via North Arm and the Western Entrance to Western Port.</p> <p>The Project processes that may affect Grayling are related to:</p> <ol style="list-style-type: none"> 1. Potential entrainment of: <ol style="list-style-type: none"> a. larvae during dispersion from freshwater streams into the marine environment, and b. juveniles that may live in or migrate through Western Port during their six to ten-month marine phase. 2. Potential effects of the cold-water discharge on dispersing larvae and migrating juveniles.

Species	Impact
	<p data-bbox="562 215 1995 244">3. Potential toxic effects of residual chlorine in the cold-water discharge on dispersing larvae and migrating juveniles.</p> <p data-bbox="562 263 1503 292">The impacts to larvae, juvenile and adult populations were assessed as follows:</p> <ul data-bbox="562 311 2018 598" style="list-style-type: none"> <li data-bbox="562 311 2018 403">· Larvae: Larvae may disperse into the marine environment during high freshwater flows from the Cardinia Creek, Bunyip River and Lang Lang River. The general pattern of water movement in Western Port indicates a high proportion of larvae would likely follow the currents down the eastern side of French Island, not past Crib Point. <li data-bbox="562 438 1995 499">· Juveniles: Juvenile Grayling that live in the marine environment and migrate to suitable river systems are independent swimmers and are likely to avoid the intake current. <li data-bbox="562 534 1962 595">· Adults: Based on the extent of potential impact pathways and the distribution of adult Grayling, the Project will have negligible effect on adult Grayling populations in freshwater reaches of Victorian streams. <p data-bbox="562 617 2002 710">In summary, it has been determined that the adult Grayling populations in the rivers and streams would not be exposed to impact pathways and that the proportion of larvae of these species that might disperse via North Arm and be affected by Project processes was low. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.</p>