



OIL SPILL IMPACTS ON WESTERNPORT SEAGRASS, MANGROVE & SALTMARSH

A new report shows that oil spills from an expanded port development in Westernport Bay could damage large areas of globally significant seagrass, mangrove and saltmarsh.

The research was carried out by Dr Hugh Kirkman, a leading researcher in marine and coastal management and assessment, including seagrass ecology, and follows a report released in 2013 showing that even small amounts of oil released into Westernport Bay could spread quickly and be virtually impossible to stop.

Both reports were commissioned by the Victorian National Parks Association after the Victorian Government announced plans to expand the Port of Hastings into an international container port, drastically increasing shipping traffic from fewer than 100 ships a year to more than 3000 annually, dramatically increasing the risk of oil spills.

The report, *Impact of Proposed Port of Hastings Expansion on Seagrass, Mangroves and Saltmarsh*, can be downloaded from the Victorian National Parks Association website.

Key findings

- **Impacts on seagrass, mangrove and saltmarsh:** An oil spill in Westernport Bay would damage large areas of seagrass, mangrove and saltmarsh depending on tidal and weather conditions.
- **Mangroves are highly susceptible to oil exposure,** an oil spill could kill them within a few weeks to several months.
- **Oil will adhere to seagrass.** Organisms living on seagrass blades or using seagrass beds as nurseries (i.e. fish and birds) are highly sensitive to oil on the seagrass and in mangroves.

WESTERNPORT – RAMSAR WETLANDS UNDER THREAT

Westernport is internationally recognised for its Ramsar-listed wetlands but its animals and plant life are under continual threat.

- Upper catchment runoff, dredging, additional nutrients and changed hydrology are reinforced

by climate change and natural disturbance to put Westernport in a vulnerable position.

- The main threat to Westernport seagrass comes from the turbidity of eroding edges, runoff and disturbance of areas already denuded of seagrass.
- Mangroves are threatened by land clearance and possible oil spills.
- Saltmarsh is vulnerable to land clearing and a lack of respect for its value.

Major dredging, increased wave action from container ships, land clearing and the introduction of marine invasive species are all very likely to happen if the Hastings port development goes ahead.

Areas at risk of oil spills

- **Long Island Point Jetty:** A 200 tonne spill of heavy fuel oil (this is a conservative oil spill scenario) from Long Island Point jetty during summer would put intertidal seagrass from Hastings to Yaringa Marine National Park at risk, particularly at low tide. Mangroves around Quail Island could also be badly damaged.
- **McHaffie's Reef:** A 200 tonne spill of heavy fuel oil at McHaffie's Reef would put seagrass meadows and mangroves on the eastern side of Tortoise Head at risk.
- **Long Island Point Jetty:** A 66 tonne spill of diesel oil from Long Island Point Jetty would impact on seagrass and mangroves at French Island Marine National Park during summer. During winter there is a higher probability of diesel oil drifting towards French Island Marine National Park and Phillip Island Nature Park, exposing these areas to surface films.

KEY THREATS

Dr Hugh Kirkman's research findings focused on seagrass, mangrove and saltmarsh species found in Westernport Bay, and why these species are environmentally significant.

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Westernport mangroves.

Photo: Tim Allen

It also looked at the distribution of these habitats in the bay, the main threats to these habitats and the likely impact on them of three different oil spill scenarios.

A comprehensive risk assessment of oil spills from shipping was used to identify where in Westernport seagrass, mangrove and saltmarsh would be most vulnerable to oil spills and the likelihood of particular shores being impacted.

The threats assessed include:

- The footprint of the new proposed port and facilities and primarily the threat on seagrass beds. While planning on the new port footprint is still in the early stages, we do know that the bulk of the development will occur in and around Long Island Point Jetty, including substantial dredging for the turning circle of container ships.
- The potential for waves generated by vessels to disturb seagrass, mangrove and saltmarsh by increasing turbidity or through erosion.

WHAT'S AT RISK?

Seagrass meadows

There are four species of seagrass growing in Westernport, *Amphibolis Antarctica* (forms beds in subtidal water on sand or near rocks), *Heterozostera nigricaulis*, (a subtidal seagrass that grows on muddy sand, sand or mud), *Zostera muelleri* (intertidal seagrass



Seagrass meadows, Westernport.

Photo: Mark Norman

and likely covers the most area) and *Halophila australis*.

Seagrass plays a vital role as a nursery for juvenile fish and prawn species that are taken both commercially and recreationally. It stabilises seabed sediment, provides a collection site for organic detritus eaten by detritivores and is a nutrient sink for inorganic nitrogen and phosphorus.

One of the main threats to seagrass in Westernport Bay is the reduction of light to plants caused by an increase in sediment in the water, phytoplankton blooms and the excessive growth of epiphytes.

Seagrass in Westernport has declined dramatically since it was first measured in 1975, when it covered 250km². By 1984 this coverage had fallen by more than

70 per cent to just 72km². Since then there has been an improvement in seagrass coverage, with Melbourne Water measuring it at 150km² in 2011.

Mangroves

In Victoria, mangroves grow at their southernmost global limit and only one species exists, the grey or white mangrove *Avicennia marina*. The var. *australasica*, which is the only variety found in Westernport, can grow to 10 metres high, but generally reaches 1.5m to 4m, quite possibly because it is growing at its geographical limit and in lower southern temperatures.

The Environmental Protection Authority lists Westernport Bay's mangroves as ecologically stressed and extremely sensitive to disturbance and other impacts.

Mangroves are vulnerable to sea level rise and will move landwards as an adaptive response, playing an important coastal defence role by creating a land-based buffer against future storm surges.

Development can prevent mangroves from adapting to climate change by making it impossible for them to move further inland and away from rising sea levels, effectively effecting creating a "coastal squeeze".

There are 18km² of mangroves in Westernport.

Saltmarshes

Saltmarshes occur around much of Westernport's coastline, generally between mangroves and more land-based vegetation. They are also an important nursery for fish.

A number of the larger saltmarshes in Westernport occur in protected areas, such as the Yaringa, French Island and Churchill Island marine national parks.

Saltmarshes in Westernport are likely to be very vulnerable to sea-level rise and other consequences of climate change, especially rising air and water temperatures.

Large areas of saltmarsh have been lost over the years, due mostly to agriculture and industrial development around the western and northern shores of the bay. Apart from some substantial losses around the Hastings foreshore and marina saltmarsh has more recently been preserved near Long Island Point and at The Inlets.

There are about 1000ha of saltmarsh remaining in Westernport.

IMPACTS FROM DREDGING

Based on the 2009 development plans outlined in the Port of Hastings Land Use and Transport Strategy and the potential scenario for the revised planning of the port expansion:

- Many existing threats to seagrass meadows will be increased by the development and substantial areas of subtidal seagrass will potentially need to be removed along the western shore of the Lower North Arm.
- The area where dredge spoil will be deposited, if it is in Westernport, is about 100ha and about three million tonnes of material.
- Further north of the development site, disturbing potential acid sulphate soils may be a problem if mangrove substrate is moved or mangroves are destroyed - acid sulphate soils can cause fish kills and prevent recolonisation of shore plants.
- Walls, port facilities and causeways are all structures that can impede hydrological flows, causing erosion of seagrass beds, shorelines, mangroves and saltmarsh. Tidal flows may be impeded and there may be stagnant areas left by these structures

MEDIA IMAGES AND VIDEO

High resolution images and video footage of Westernport, as well as video simulations of the oil spill modelling scenarios, are available to the media.

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