GOVERNMENT OF WESTERN AUSTRALIA

Department of **Water and Environmental Regulation**

Department of **Primary Industries and Regional Development**

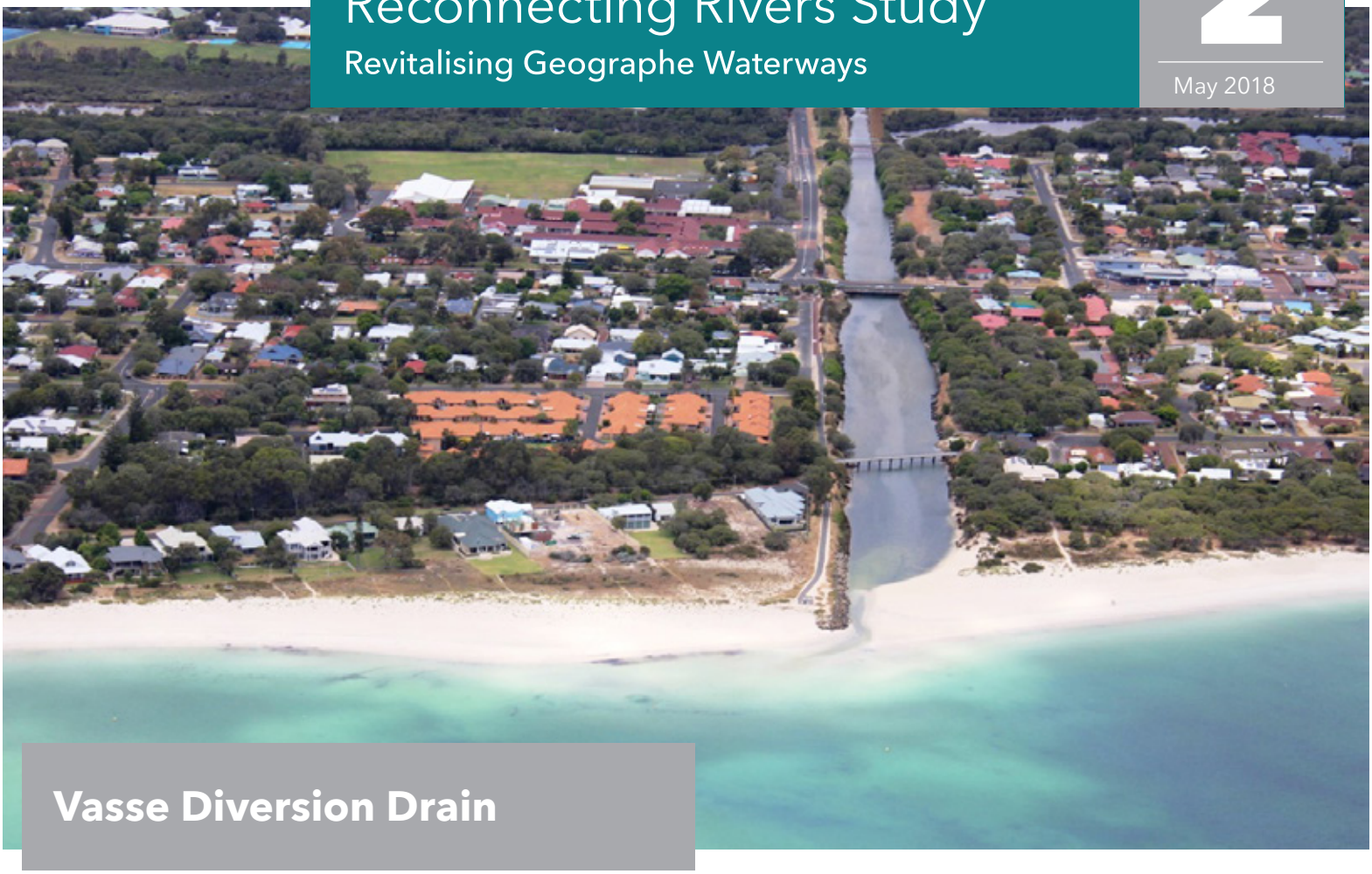
Project Factsheet

2

May 2018

Reconnecting Rivers Study

Revitalising Geographe Waterways



Vasse Diversion Drain

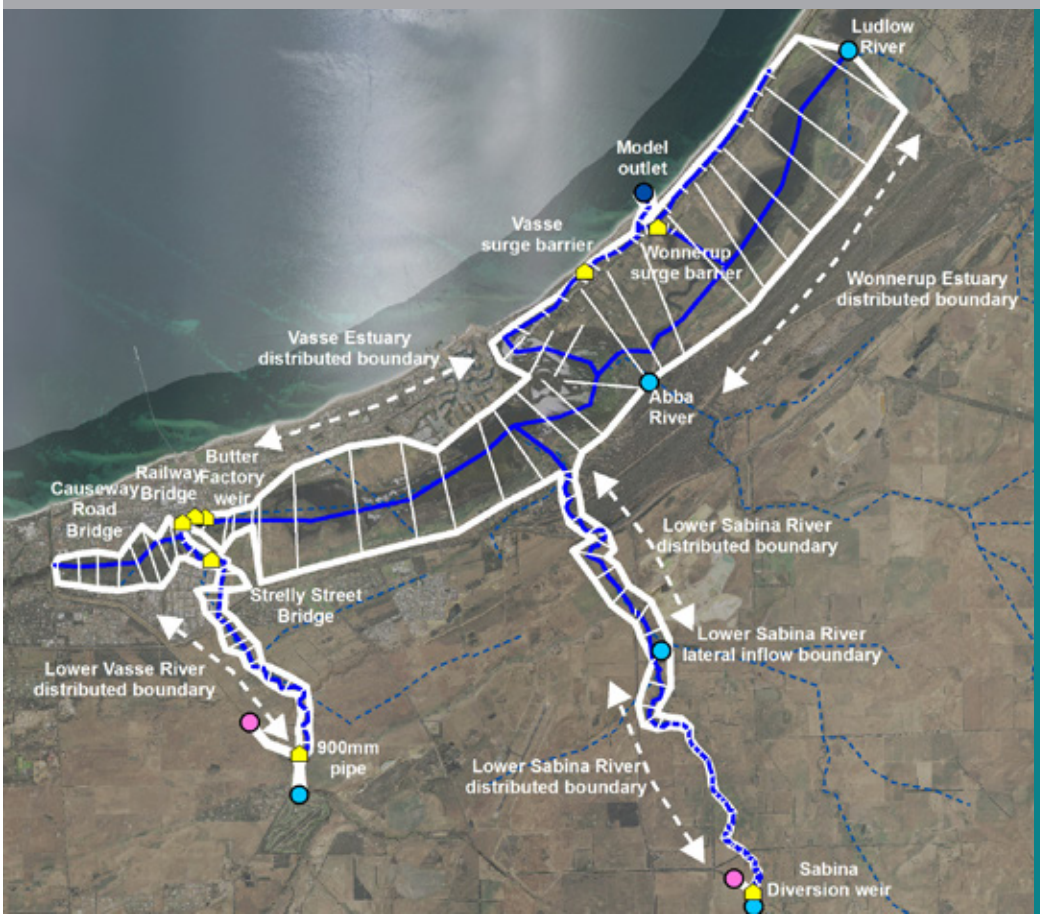
The Lower Vasse River and Vasse-Wonnerup wetlands are highly valued by the local community. Declining water quality and annual algal blooms are a concern for everyone. The catchments of these waterways have been highly modified over the last decade to enable urban and agricultural development. Major drainage works such as the Vasse Diversion Drain were installed for flood protection to support developments. These drainage works have substantially reduced flows to many rivers in the catchment.

The Reconnecting Rivers study was carried out by the Department of Water and Environment Regulation to look at options to increase water flows from the catchment into the Lower Vasse River and Vasse Estuary.

The study was initiated in response to community interest and concerns and forms part of the broader Revitalising Geographe Waterways program that aims to improve water quality, waterway health and management of Geographe Waterways.

The Vasse Diversion Drain was dug in 1924 to reduce flooding in Busselton. The drain connects approximately 90 per cent of the Vasse and 60 per cent of the Sabina River catchments directly to Geographe Bay.

Reconnecting flows from the upper catchments of the Vasse and Sabina rivers



A hydraulic model was developed by the Department of Water and Environmental Regulation to assess the different options to increase flows and examine flood risk and water quality.

The study looked at options to reconnect the Vasse Diversion Drain either partially or fully to the Lower Vasse and Sabina rivers through the installation of additional culverts. Options were assessed on flood risk and potential improvements in water quality.

The study found that flows can be increased into the Lower Vasse River without increasing the flood risk in winter by doubling the size of the culvert between the Vasse Diversion Drain and Lower Vasse River. As a direct action of this study the Water Corporation will install a second 900 mm culvert as a part of their Vasse Diversion upgrade in 2019. This will increase flows into the river in winter, reducing nutrient concentrations at the end of spring, and hopefully reduce the intensity of summer algal blooms.

The study showed that further increases in the size of culverts between the Lower Vasse River and Vasse Diversion Drain would result in an increased flood risk to Busselton and substantially increase the nutrient loads delivered to the Vasse-Wonnerup wetlands.

Similarly increasing the size of the culvert into the Lower Sabina River would result in a large increase in nutrient loads, particularly nitrogen.

Higher flows would move sediment from the river beds but would also increase erosion, contributing to sediment build-up downstream. Due to the potential negative impacts on flood risk and water quality these options will not be further explored.

Water in the Vasse Diversion drain only flows in winter months when it rains and has high nutrient concentrations. Transfer of the flows to the rivers will only occur in winter when there is water and will contribute to increased nutrient loads to the Lower Vasse River and Vasse Estuary.

Alternative water sources from the catchment

Sabina River detention basin full after 1:10 year flood in 2016 demonstrating its importance in flood protection

The study looked at options of using other sources of water from the catchment to increase flows into the Lower Vasse River over summer months to improve water quality and reduce algal blooms. Unfortunately there are limited sources as most of the catchment rivers only flow in winter months.

Using treated waste water from the Busselton Waste Water Treatment Plant was the most feasible option to maintain flows in the Lower Vasse River over summer months. As an action of this study the City of Busselton will further explore the feasibility of using treated waste water to maintain summer flows to reduce algal blooms.

The study looked at the option of using the flood detention basins on the Upper Vasse and Sabina rivers and Vasse Diversion Drain to hold back water in winter months to maintain summer flows.

However, as this action would compromise their flood protection this option was not recommended.

The study also considered a purpose built dam to hold back water in winter, however it would be need to be very large to hold enough water to maintain summer flows and is likely to suffer algal blooms over summer months. This option was not recommended due to cost, management and drying climate.

A dam with a volume of 18 GL, covering an area of 9 km^2 would be required to store enough water to maintain flows in the Lower Vasse River over summer.

Removing barriers

Butter Boards

The Butter Boards were installed to improve visual amenity of the Lower Vasse River over summer months.

The study looked at the feasibility of removing barriers to increase flows. The Butter Boards in front of the Busselton museum, which were installed circa 1933 to hold back water in the Lower Vasse River over summer, could be removed without increasing flood risk. Removing the Butter Boards and returning the Lower Vasse River to a seasonally flowing river is one of the options that the City of Busselton is further exploring

The study also looked at removing the surge barrier on the Vasse Estuary exit channel to improve flows, however modelling highlighted the importance of the surge barrier in protecting Busselton from flood due to storm surges.

Options to manage the barriers differently to improve water quality and passage for fish (without compromising flood protection) are being looked at in the Review Surge Barrier Project.

Where to next

Key recommendations from the Reconnecting Rivers study are already being implemented. They will also inform water management plans being developed by the City of Busselton and the Department of Biodiversity, Conservation and Attractions for the Lower Vasse River and Vasse-Wonnerup wetlands. These recommendations will compliment other projects and scientific studies to improve water quality in the Lower Vasse River and Vasse-Wonnerup wetlands through the Revitalising Geographe Waterways program.

The Reconnecting Rivers Summary and Technical reports can be found under resources at rgw.dwer.wa.ov.au/rgw-publications/.

GeoCatch

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Revitalising Geographe Waterways

VASSE taskFORCE

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