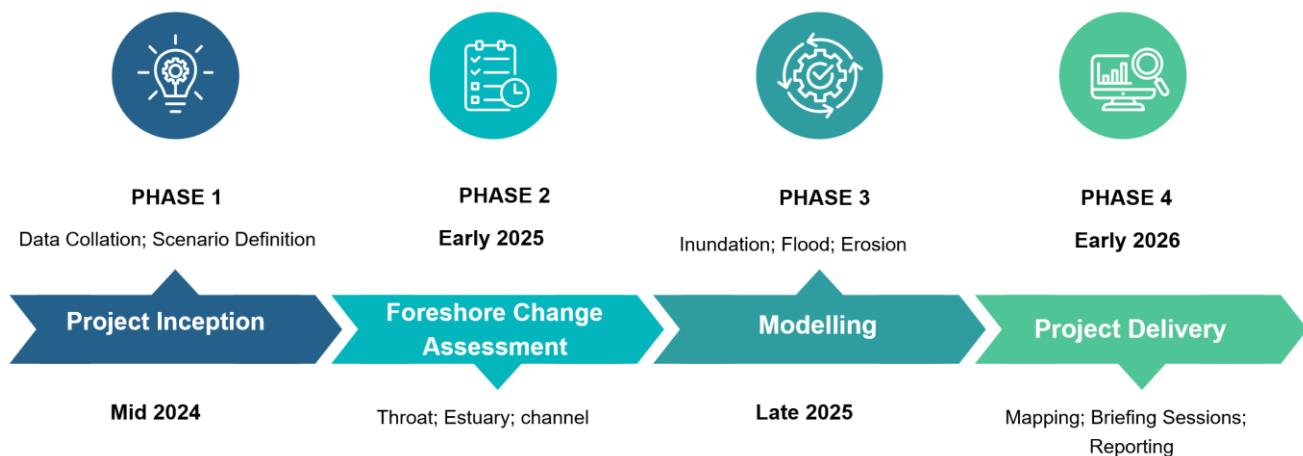


Swan Canning Riverpark foreshore Risk identification and mapping project

The Department of Biodiversity, Conservation and Attractions (DBCA) is undertaking a project for the Swan River (Derbal Yirragan) and Canning River (Djarlgarro) to identify, understand and communicate risk to the Riverpark from erosion, inundation and climate change impacts.

The project is due for completion in early 2026 and will produce foreshore risk maps for the Swan Canning Riverpark (Riverpark) to inform risk assessments, and adaptive planning and management responses.



Project Update: Phase 2 Foreshore Change Assessment

Phase 2 focused on understanding the different parts of the river system (domains), considering physical changes to the river foreshores and riverbed. The approach has been to identify drivers of change in the Swan-Canning system, characterise how the system responds, interpret active processes and predict future change. It is acknowledged that using past river behaviour to make predictions is challenged by the Swan-Canning's complex river morphology, its long history of dredging, reclamation and walling, plus an extended period without major floods.

Foreshore Change Assessment – why does it matter?

Different parts of the river have discrete modes of response to:

- Water motions, wave energy and flooding, including sea level rise.
- Foreshore sediment supply.
- Human modifications.

Undertaking the Foreshore Change Assessment to understand how these components interact is critical to developing conceptual models for predicting change, for consideration in adaptation planning.

Project contact: Riverbank Program Coordinator, Swan Canning Waterways Branch

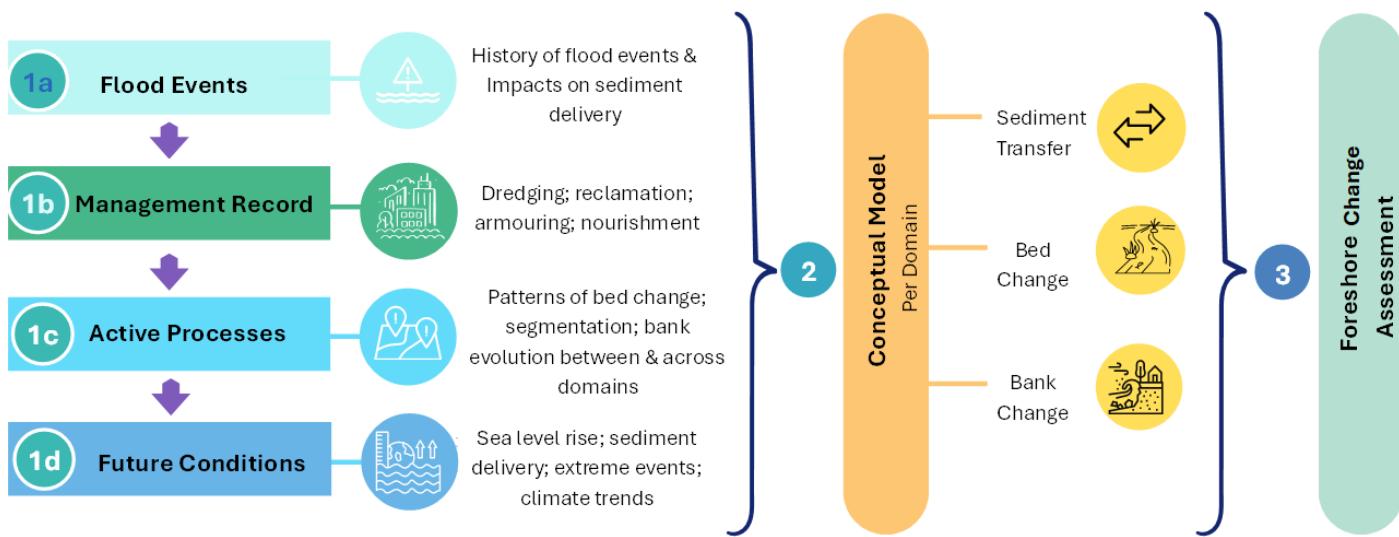
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Information current as at December 2025

Phase 2 assessment has included:

- Demarcation of river domains using an evidence-based understanding of how sections of the river respond and interact.
- Identification of major river modifications, flood variability and sea level changes to the system.
- Evaluation of bed and bank change in each river domain, including understanding erosion and deposition.

Three steps to complete the Foreshore Change Assessment (Phase 2) are summarised below. Step 1 representing physical process evaluations, Step 2 involved formulation of conceptual models for sediment transfers, bed and bank change, with step 3 identifying potential for foreshore change.



Implications of Assessment for Foreshore Management

Understanding how the Swan-Canning system can change, including response to flood events or sea level rise, is critical for targeting management effort. Although many present-day problems are persistent responses to actions from previous decades, future climate change or a moderate river flood will cause issues that have not been part of foreshore management over the last 40 years. Recognising how the river system changes is important to avoid maladaptation, where actions fail to work, or create new problems.

Assessment of bed and bank change has confirmed distinct behaviour between domains. This is summarised for the Swan-Avon River System from Fremantle (Domain A) to Darling Scarp (Domain F) and for Canning River System from Melville Water (Domain C) to Canning, Wungong and Victoria dams (Domain F). Understanding of mechanisms for change and active processes supports identification of those that may be triggered by future climate conditions or flood events. This provides relevant guidance for erosion and inundation risk assessment, assisting Foreshore Land Managers in ongoing development of foreshore adaptation plans.

What's Next?

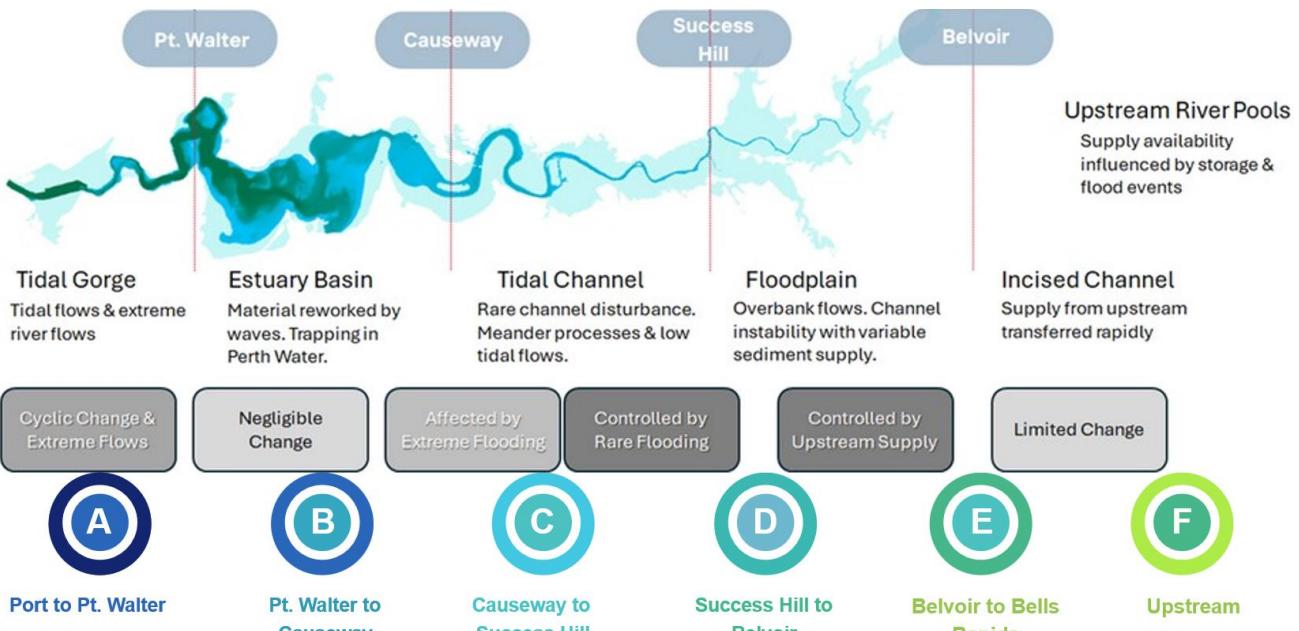
The next project phase involves consideration of inundation and flood modelling outputs in the context of the foreshore change assessment, to predict likely future change at a river reach scale. Outcomes of the assessment will be used to produce foreshore risk maps of the Riverpark at 2025, 2050 and 2125 and identify foreshore assets subject to hazard. Foreshore risk maps will be presented and discussed with Foreshore Land Managers at a series of upcoming briefing sessions on disaster risk planning and management across the Riverpark.

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Swan-Avon River System Domains & Dynamics



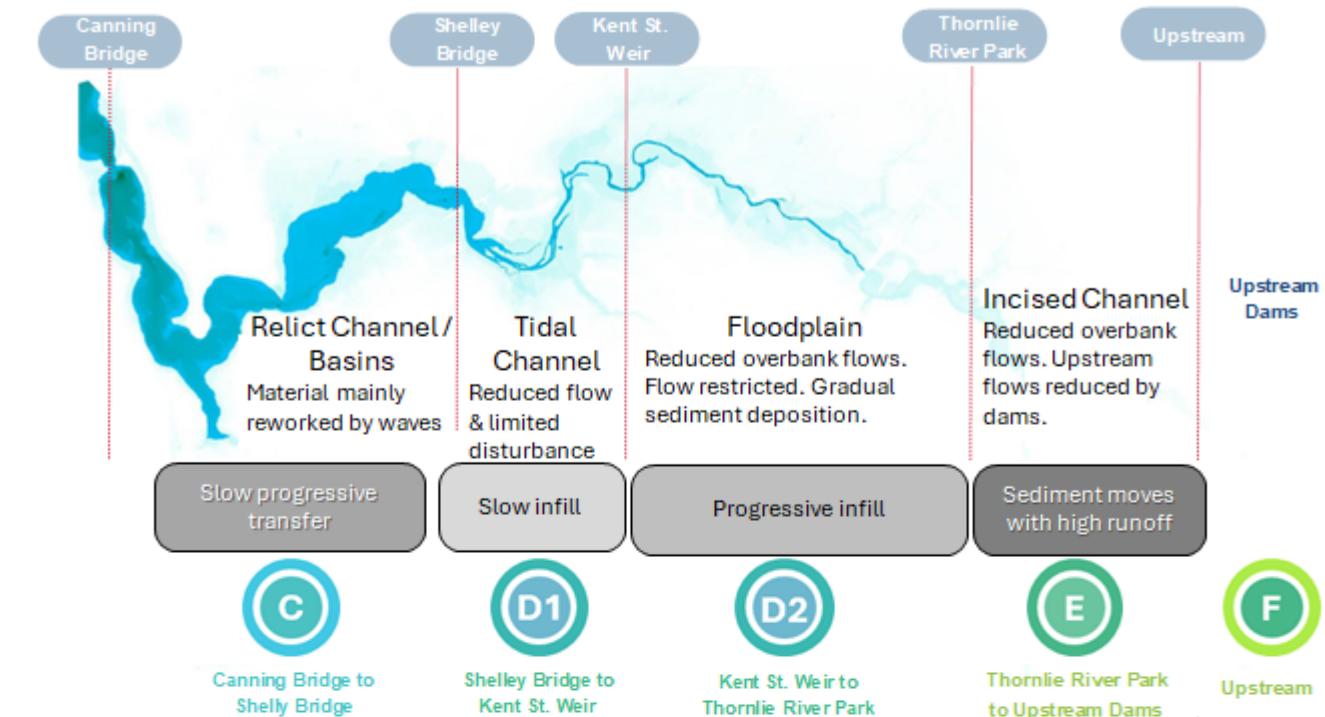
	Port to Pt. Walter	Pt. Walter to Causeway	Causeway to Success Hill	Success Hill to Belvoir	Belvoir to Bells Rapids	Upstream
Drivers	Large relative contribution of tidal flow; historic & modern modifications; tidal prism changes .	Main influence from wind waves. Some response to coastal flood levels. Limited influence of tidal & river flows.	Moderate relative contribution of tidal flow; small contribution of river flow.	Low influence of tidal flow; medium river flow influence with decreased frequency of flood impact towards C.	No tidal influence; medium to high influence of river flow increasing towards F.	Influence of river flows confined by rocky structure.
Morphology	Deep channel and tidal gorge is extensively modified and walled .	Estuary basins of Perth Water & Melville Water; supply driven features and alongshore transport and controls .	Bay head delta with wide meandering pattern and sections of straight channel moving upstream .	Sinuous meanders and straight sections with some steep banks. Non - fluvial processes less significance with distance upstream .	Channel and pools; narrow channel (deep in places) riparian vegetation influentia l.	Steeply graded river stream with rocky bed to below Toodyay transitioning to river pools with sandy beds.
Assessment Approach	Accretion & erosion assessment; cross - sectional areas & understanding of changes on terrace margins .	Targeted assessment for key areas - (volumetric and bank)	Gross volume changes; bank change evaluation. Effects of drains, riparian vegetation & bank stabilisation included.	Meander behaviour & overbank deposition.	Stream power and intermittent sediment storage associated with pools .	Interpretation only; behaviour likely to contribute to downstream dynamics (flow and sediment input).
Change Mechanisms	HISTORIC & MODERN MODIFICATIONS Dominated by channel dredging (widening/deepening & historic modifications) Influence of Fremantle bridges.	RECLAIMED FORESHORE ADJUSTMENT Erosion on most foreshores; adjustment of extensive reclamation (erosion); redistribution alongshore towards 'end' of renourishment.	HISTORIC DREDGING Channel widening; Meander point deposits with subsequent redistribution of depositional features; Moderate deposition mainly in dredge holes. Areas of localised erosion mainly around bridges and meanders.	SUPPLY CHANGES /STREAMFLOW Channel widening/ erosion decreasing upstream; Behavior linked to stream convergence, drains & meanders. Sedimentation upstream; channel reactivation and potential for avulsion	STREAMFLOW /GEOLOGIC STRUCTURE Erosion appears generally concentrated on the outside of meander bends, at tributary confluences, in active floodplain areas and immediately upstream of riffles .	HISTORIC RIVER TRAINING Sediment past Toodyay is quickly delivered to Guildford; River Training Scheme in 1970s mobilised massive sediment moved into river pools. This has progressed gradually with no evidence of large - scale flood transport .

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Canning River System Domains & Dynamics



Drivers	Main influence is from wind waves. Low influence of tidal flows, except at constrictions.	Moderate relative influence of tidal flow; reducing upstream.	Limited relative influence of runoff water levels.	No tidal influence; limited influence of stream flow from local catchment.	River Regulation
Morphology	Drowned river valley to form small basins, partly infilled with sediment	Bay head delta, with complex channel structure, transitioning towards tidal channel system subsequent to weir construction	Gradually meandering channel, with broad overbank areas, previously subject to flooding.	Meandering low - gradient stream channel, lined with riparian vegetation. Increasing stream incision upstream.	Incised stream channel with moderate gradient. Pool-riffle structure within steep - sided banks.
Assessment Approach	Net bed change, and bank movement. Evaluation in the context of wind waves, water levels and riparian vegetation.	Bank change assessment. Evaluation in the context of water levels and riparian vegetation.	Bank change assessment. Evaluation in the context of riparian vegetation and flows.	Bank change assessment. Evaluation in the context of riparian vegetation and flows.	Interpretation only: behaviour which may contribute to downstream dynamics (flow & sediment input).
Change Mechanism	RECLAIMED FORESHORE ADJUSTMENT Extensive reclamation subject to subsequent erosion; general redistribution alongshore with influence of riparian vegetation establishment.	TIDAL & FLOW REDUCTION Channel structure largely maintained. Some longer - term channel narrowing and increased vegetation. Recent bank destabilization associated with high water levels.	STREAMFLOW CHANGES Channel structure generally maintained. In - channel sediment deposition features and increased riparian vegetation.	STREAMFLOW CHANGES Infilling of pools, with sedimentation associated with flow regulation from dams. Generally increased riparian vegetation.	UPSTREAM DAMS River regulation following construction of dams: to supply water to Perth Metropolitan area .