

Drainage for Liveability Fact Sheet

Living Streams in Water Corporation assets

Purpose

This fact sheet, jointly developed by the Department of Water (DOW) and Water Corporation (WC), provides basic technical information required to design and construct Living Streams in Water Corporation assets (new or enhanced, rural or urban). It is to be used as guidance with each situation considered on its merits. Other drain owners are encouraged to use this as a basis for design however other documents may also be relevant and inform design.

Objectives

Living Streams should be created as multiple use corridors to achieve a wide range of benefits to the community and the environment. The objectives of Living Streams include:

- Flood control and conveyance
- Erosion and sediment control
- Establishing healthy ecosystems
- Creating diverse habitat
- Improving water quality
- Enhancing amenity of the area
- Providing recreational space
- Increasing environmental awareness.

These objectives can only be achieved whilst ensuring public safety.

Key Requirements

Flood Control and Conveyance

- Contain 50% AEP (Annual Exceedance Probability) flows within bankfull channel.
- Contain 20% AEP flows within drainage reserve/public open space. Where a Living Stream traverses a commercial or industrial area, the 10% AEP flows should be contained.
- Ensure the 1% AEP floodplain is contained within appropriate land uses

(e.g. public open space, roadways and road reserves, waterways, drainage reserves).

- Set aside sufficient land in the planning process to achieve these objectives.

Morphology

- Ensure that the morphology replicates a stable natural stream with a diversity of ecological habitats.

Vegetation

- Retain existing native vegetation where possible.
- Establish tree canopy at suitable width to shade the Living Stream and limit vegetation density within the channel.
- Establish understorey plantings outside the bankfull channel to enhance ecological benefits.
- Design and select vegetation in the minor flow channels appropriately (e.g. native sedges) to still allow conveyance and maintenance objectives.
- Design inflows to prevent siltation.
- Provide instream habitat diversity
- Use native local provenance plant species.
- Provide sufficient separation from dwellings to satisfy bushfire requirements.

Accessibility and safety

- Apply velocity x depth criteria as per DS 66 to crossings, boardwalks, bridges and side slopes limited to the edge of the living stream.
- Locate recreational areas above the minor storm (20% or 10% AEP as applicable) flood level. Any provision for public access below this level should demonstrate that public safety has been adequately addressed.

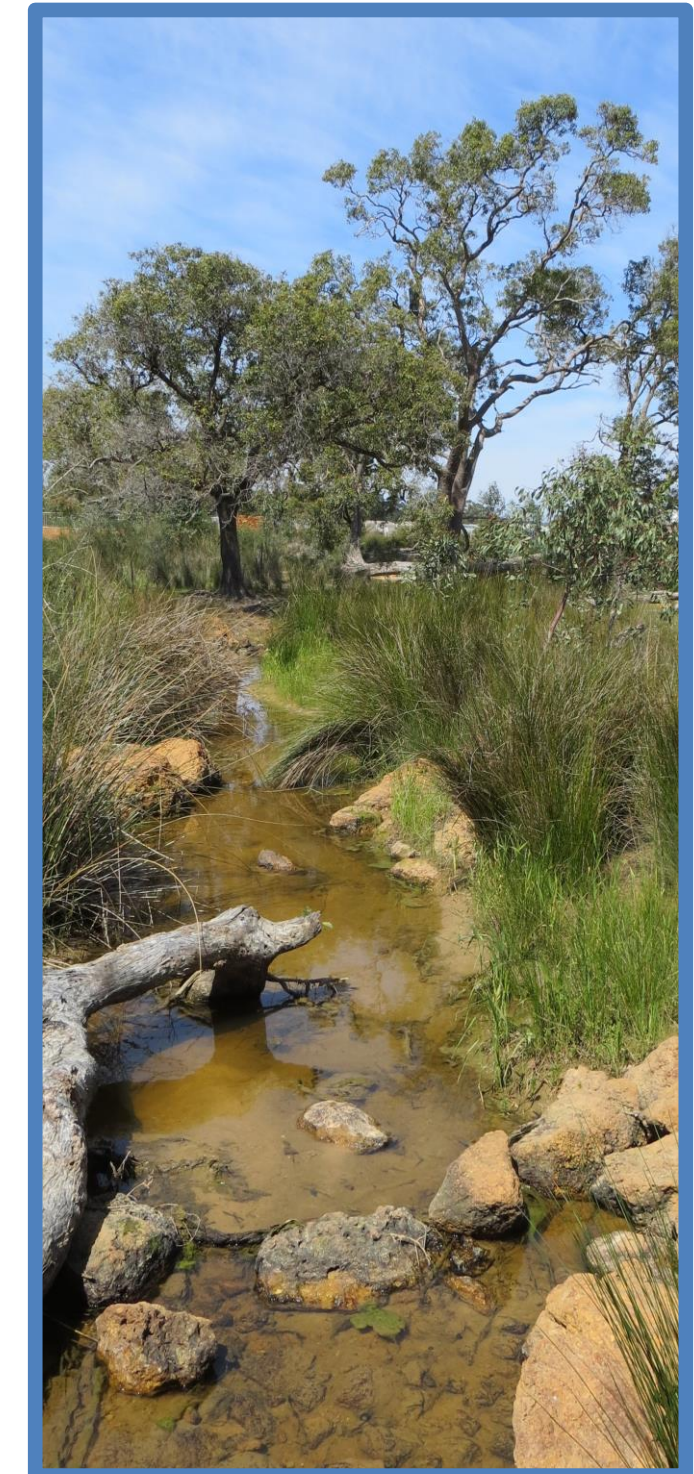
- Provide appropriate maintenance access.
- Use vegetation and landscaping (in preference to structures and fences) where feasible to restrict access to hazardous areas.
- Provide recreational access to the water's edge where safe and beneficial to recreational activities.

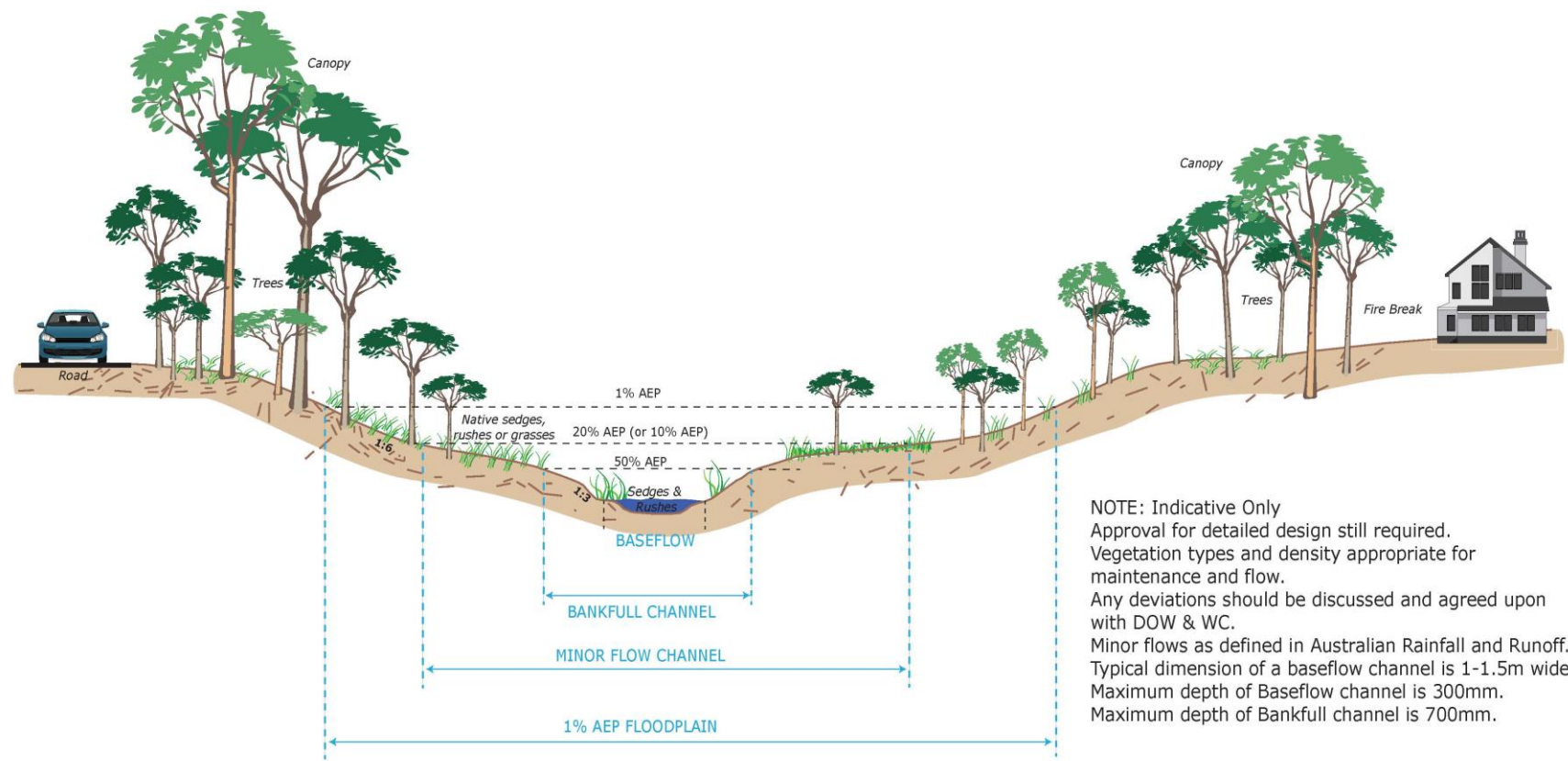
Analysis and Design

Proposals for the construction of Living Streams are required to provide a comprehensive suite of documentation demonstrating the data collection, investigation, design and maintenance of the Living Stream.

- Engineering plans, sections, details and specifications.
- Planting design drawings, cross sections, species and schedules, vegetation community descriptions and photos.
- Hydrologic and hydraulic modelling report detailing the analysis of 50% AEP, 20% (or 10%) AEP and 1% AEP storm events for existing as well as proposed waterways.
- Geotechnical report demonstrating existing on site groundwater and geotechnical conditions.
- Morphology and stream channel analysis including identification of the 50% AEP flow as well as the bankfull channel shape, dimensions, flow velocity, slope, meander wavelength and radius, etc.
- Operation and maintenance manual covering the initial establishment of vegetation as well as long term maintenance requirements once the establishment phase is completed.

- Management agreement between the Water Corporation and the Local Authority
- Design Report outlining the investigation and design methodology including critical aspects governing the final design.





Contact Details

Department of Water
 Tim Sparks, 6364 7600
 Manager, Urban Water
www.water.wa.gov.au

Water Corporation
 Suzanne Brown, 9420 2420
 Manager, Drainage & Liveable
 Communities

www.watercorporation.com.au

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Reference Documents

There are a number of key documents governing the design of Living Streams:

- Stormwater Management Manual for Western Australia (Department of Water, 2004-2007).
- River Restoration, A guide to the nature, protection, rehabilitation and long-term management of waterways in Western Australia (Water and Rivers Commission, 1999).
- Design Standard No. DS66 - Urban Main Drainage Standard (Water Corporation, Jun 2011).
- Developers' Manual (Water Corporation).

