

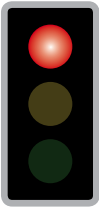
External consultation Maintenance Standards

# delivering consistent standards for sustainable asset management

## FCRM Asset Management

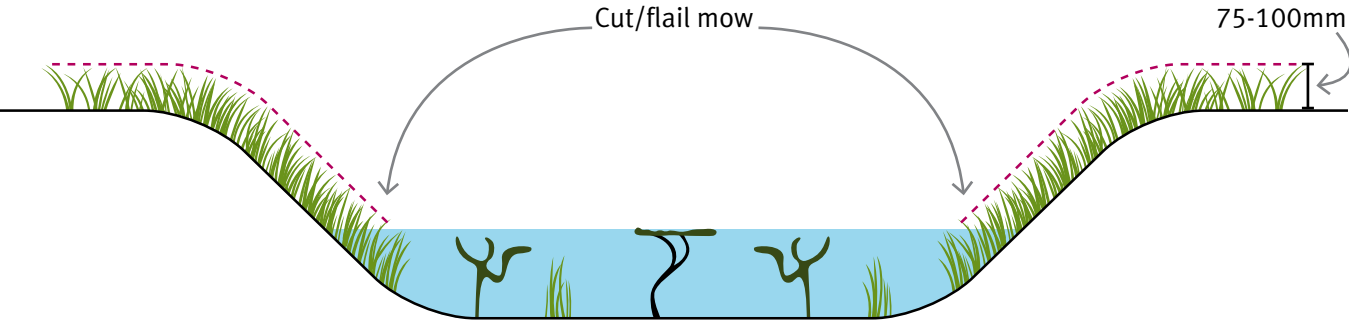
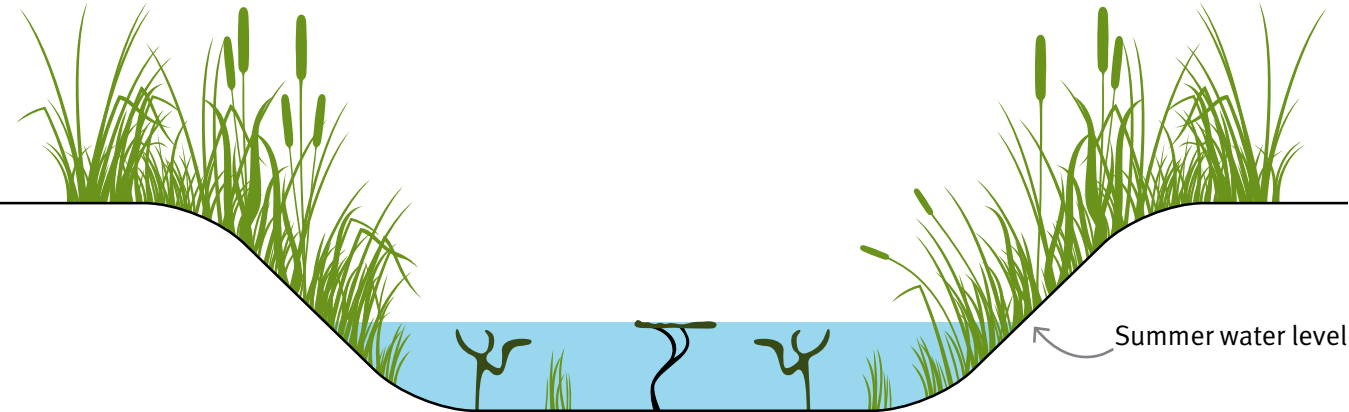
Maintenance Standards  
Version 3 March 2012

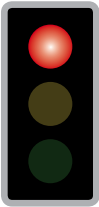




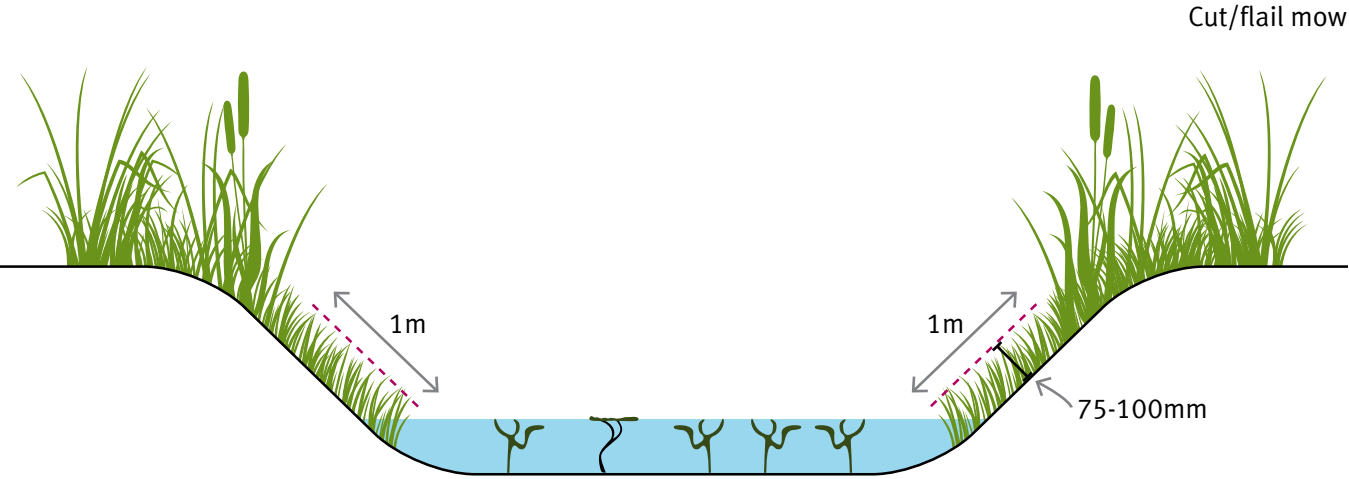
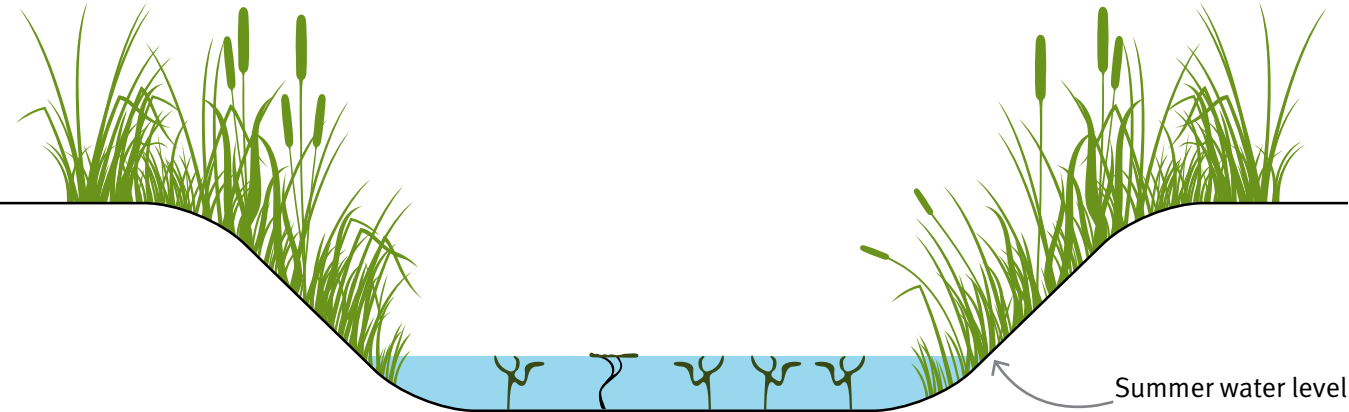
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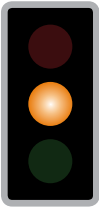
Use only where risk/limited capacity dictates. Look to enhance



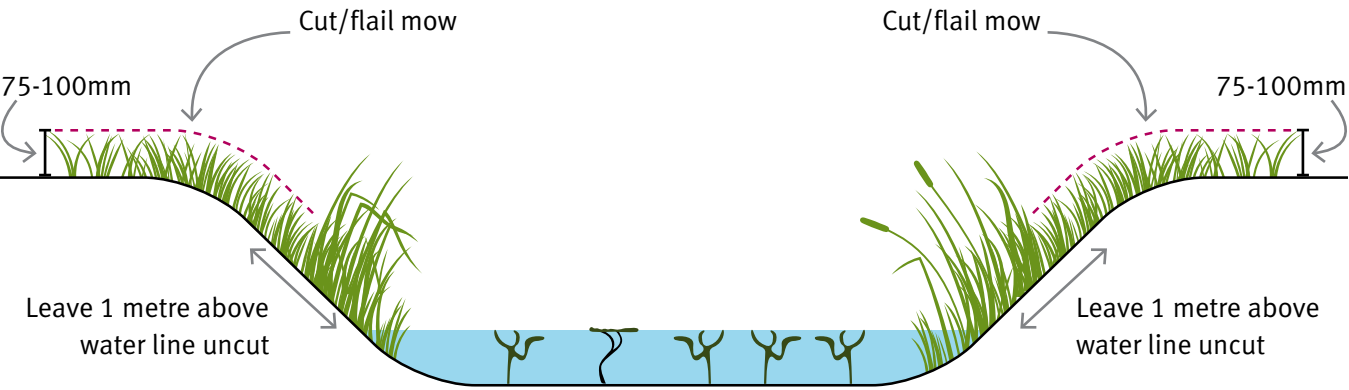
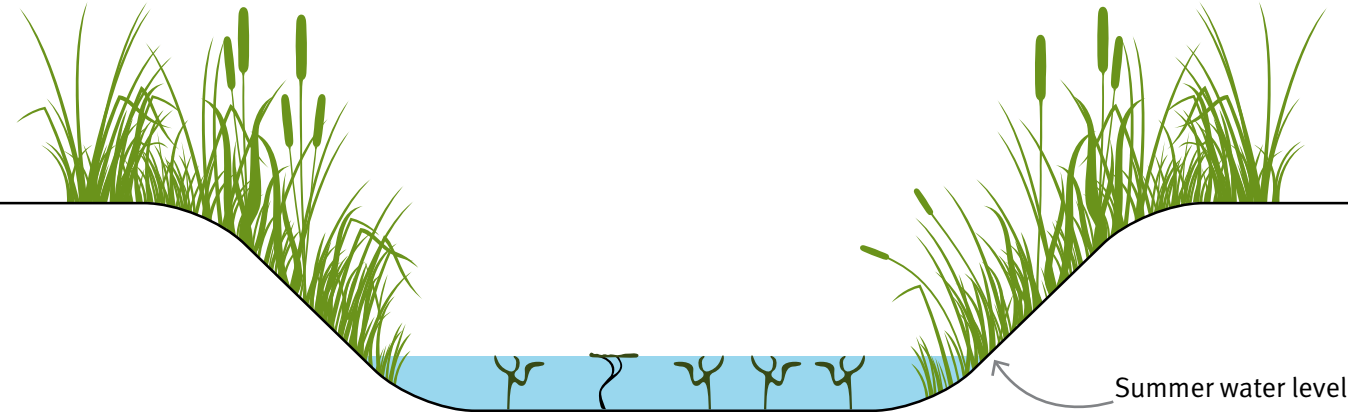


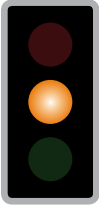
M2 Grass control



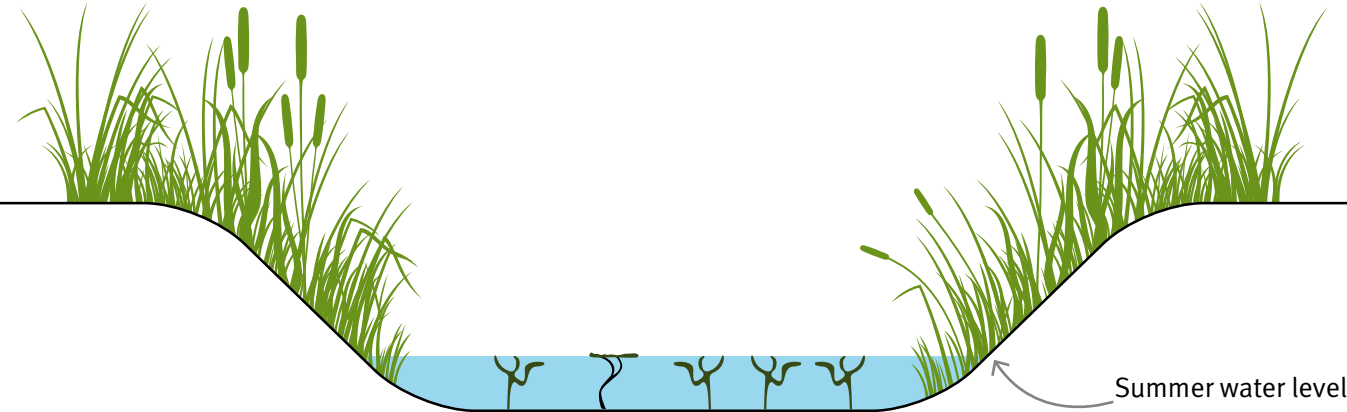


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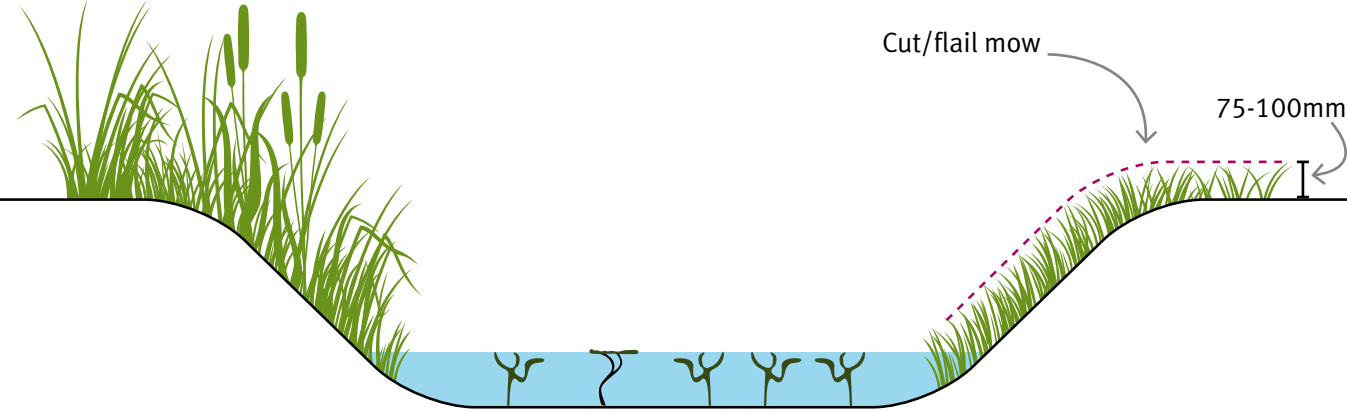


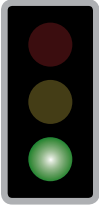


M4 Grass control

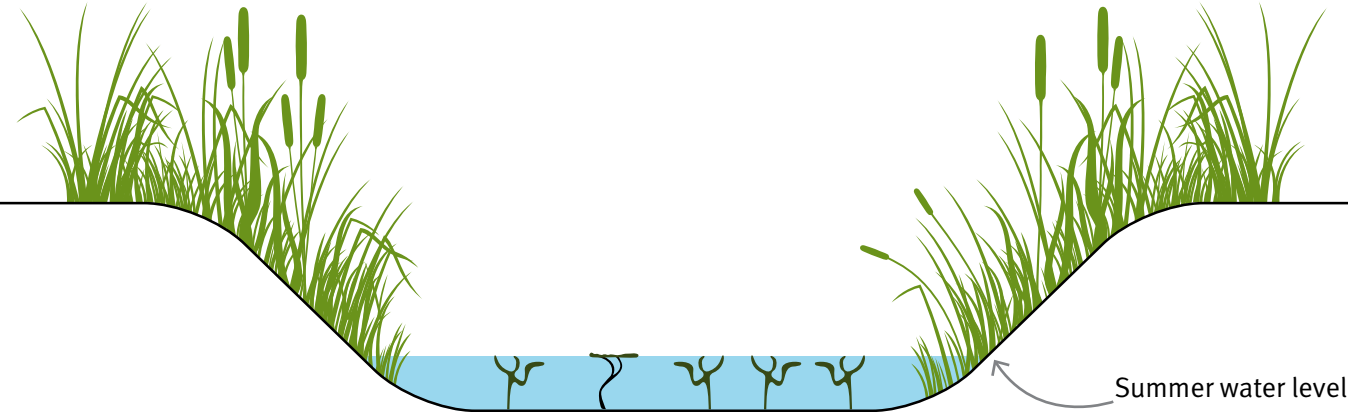


Maintenance this side only

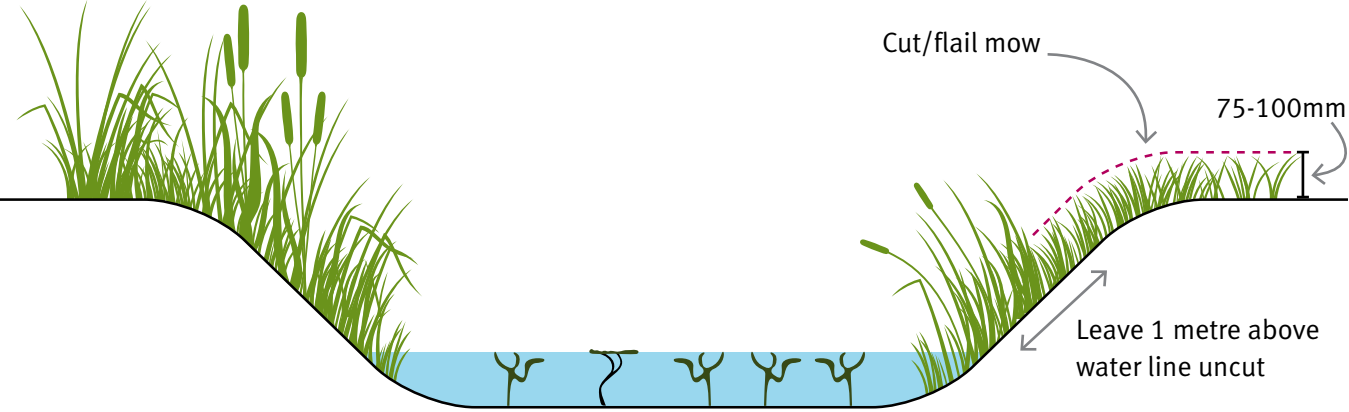


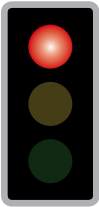


M5 Grass control

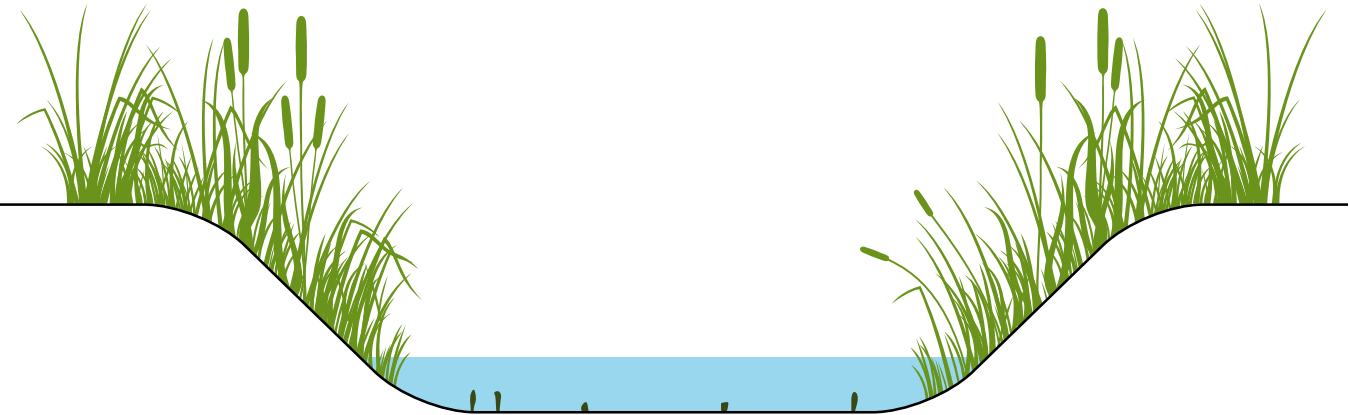
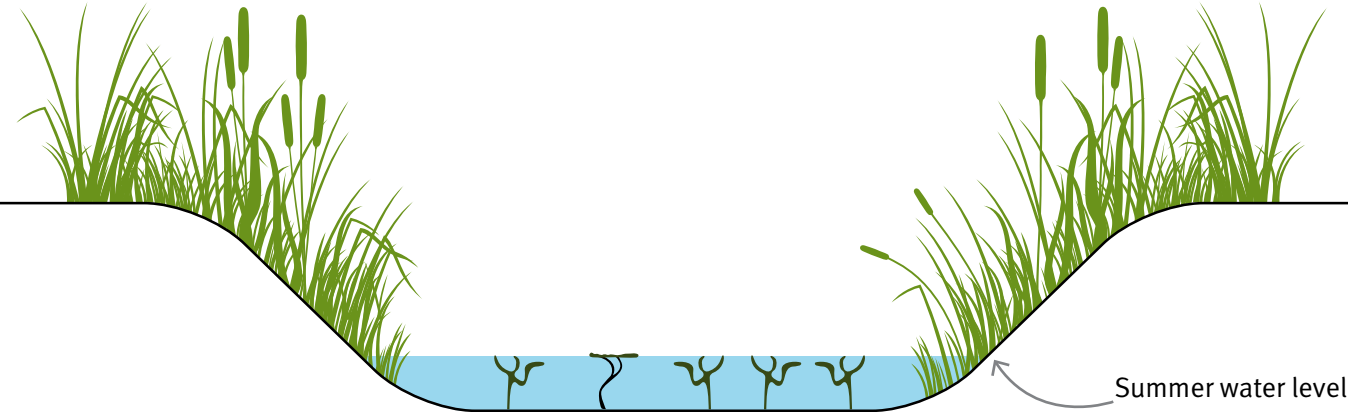


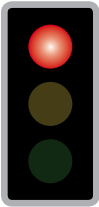
Annual maintenance this side only



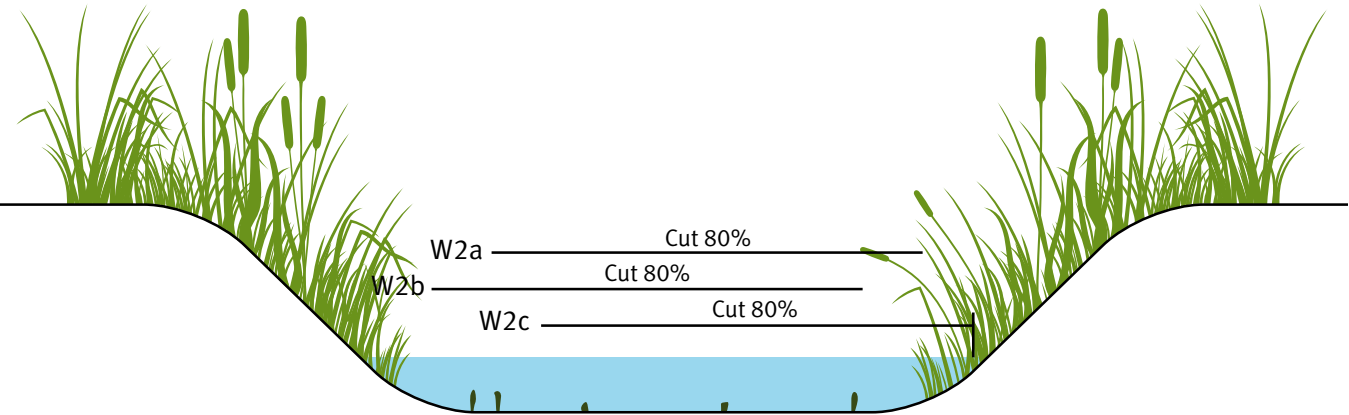
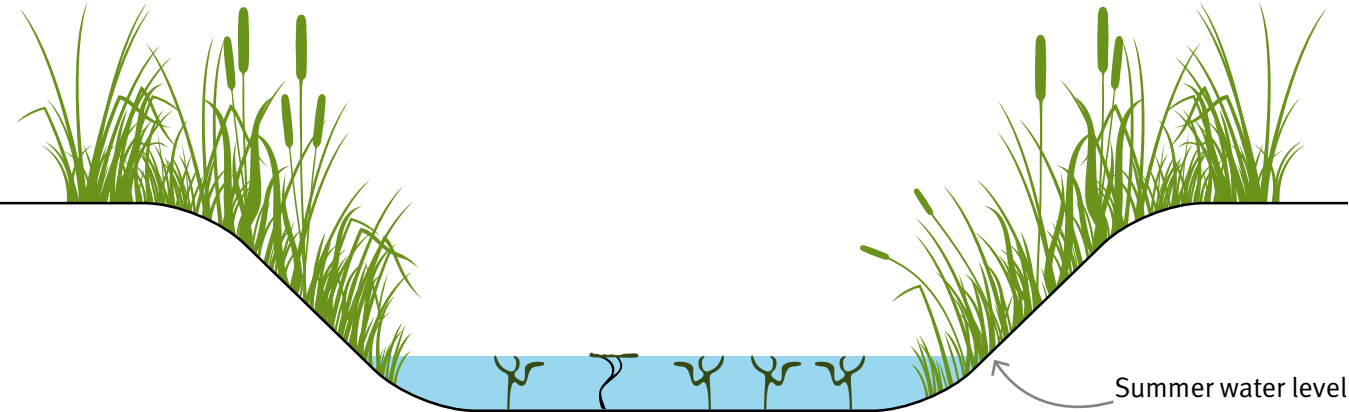


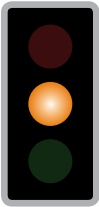
W1 Weed control



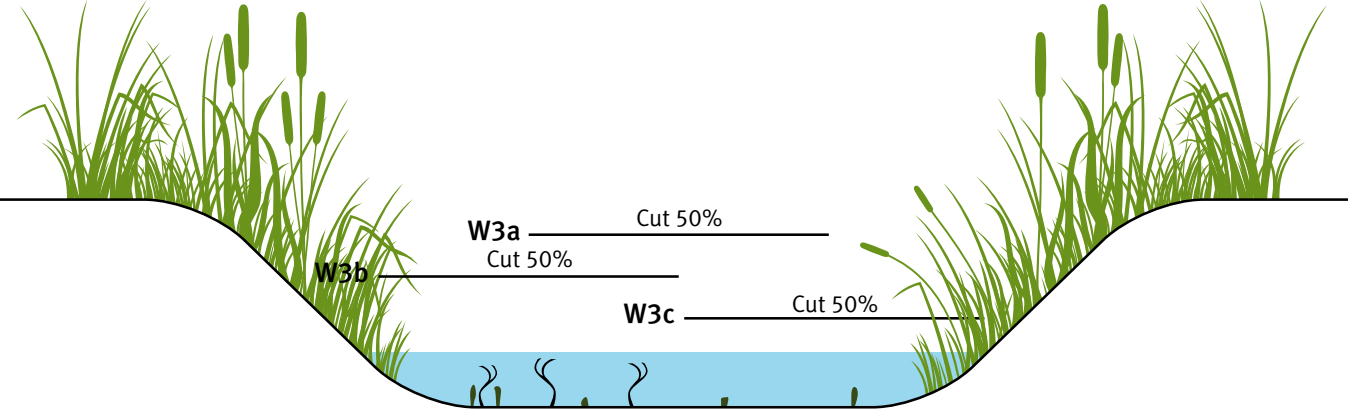
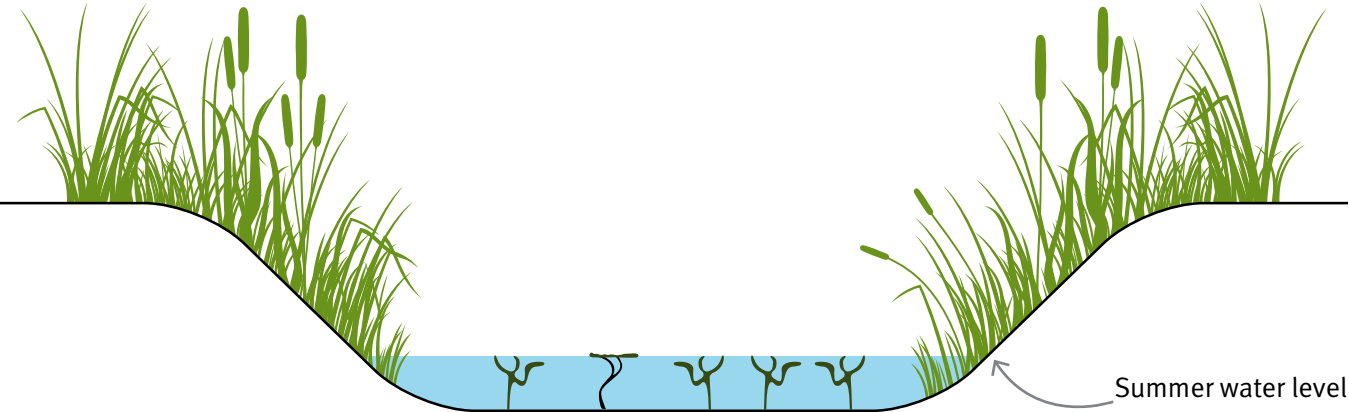


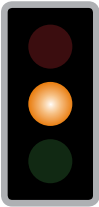
W2 a, b, c Weed control





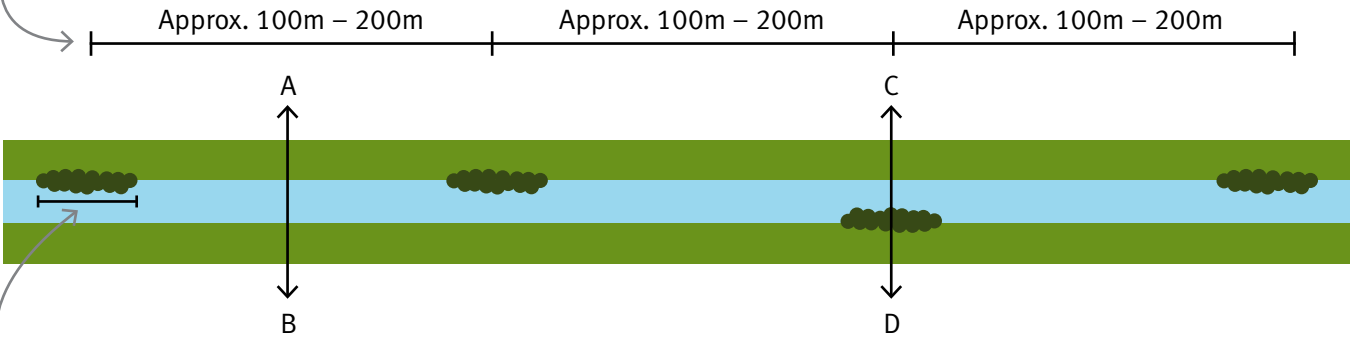
W3 a, b, c Weed control



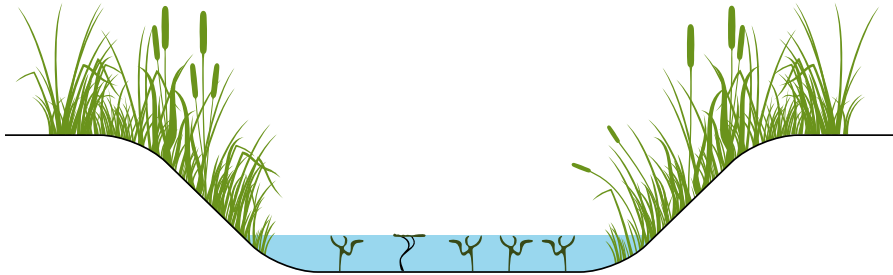


### W4 Weed control

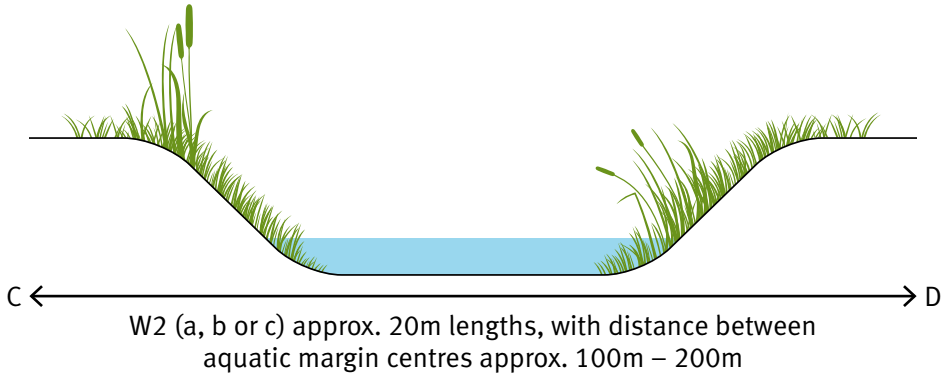
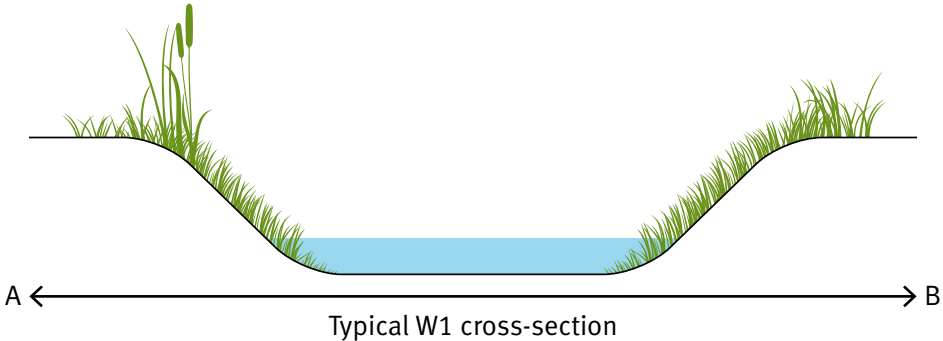
Distance between aquatic margin centres



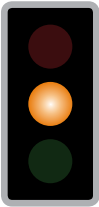
Approx. 20m of aquatic margin



Typical growth before maintenance

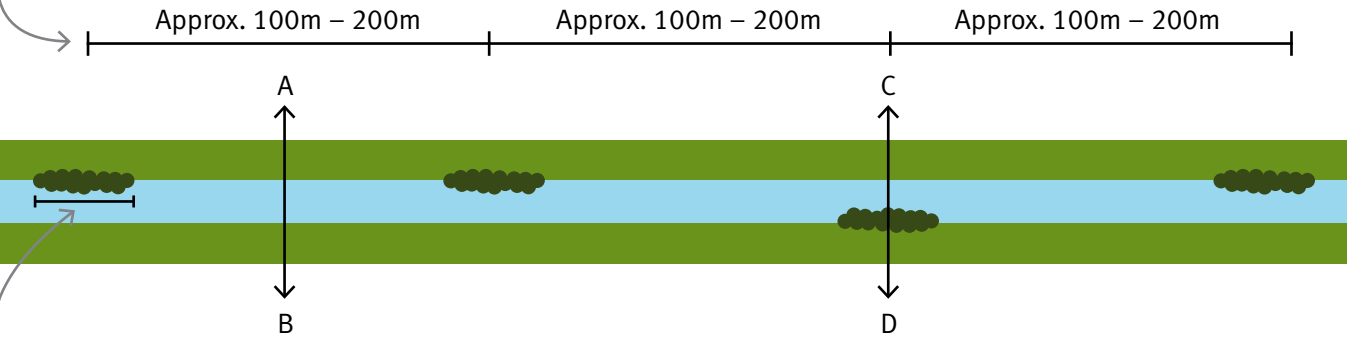


Maintain short lengths of approx. 20m of aquatic margin on alternating sides

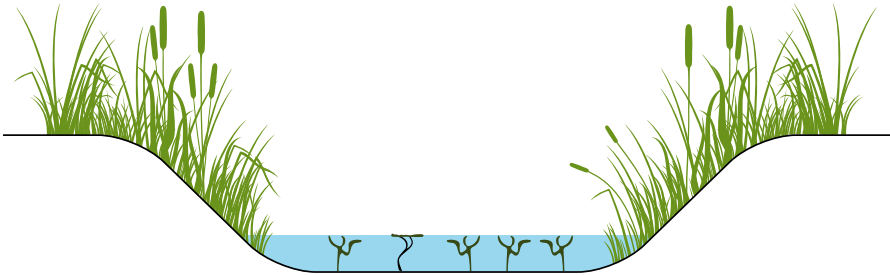


### W5 Weed control

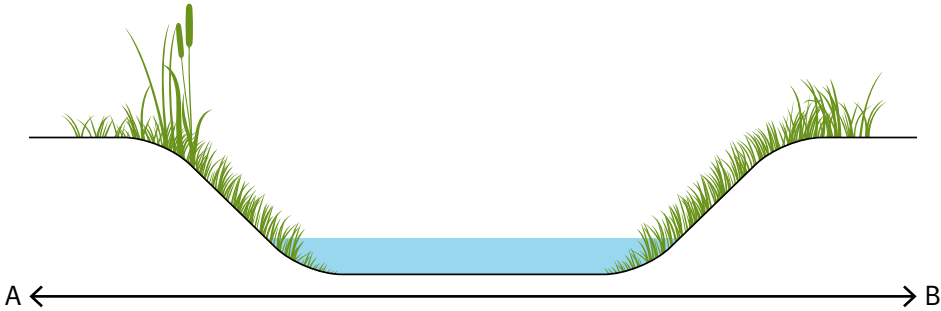
Distance between aquatic margin centres



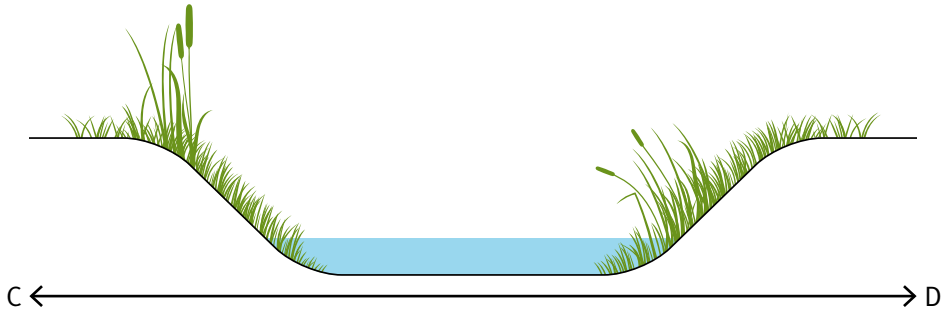
Approx. 20m of aquatic margin



Typical growth before maintenance

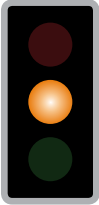


Typical W1 cross-section



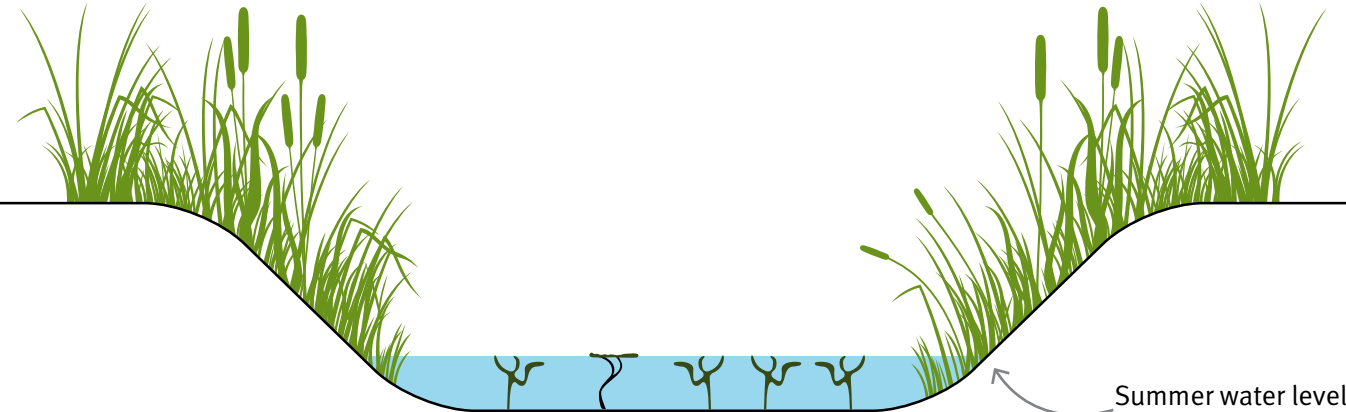
W3 for approx. 20m lengths, with distance between aquatic margin centres approx. 100m – 200m

Maintain short lengths of approx. 20m of aquatic margin on alternating sides



### W6 Weed control

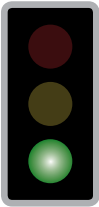
Use only where risk/limited capacity dictates. Look to enhance



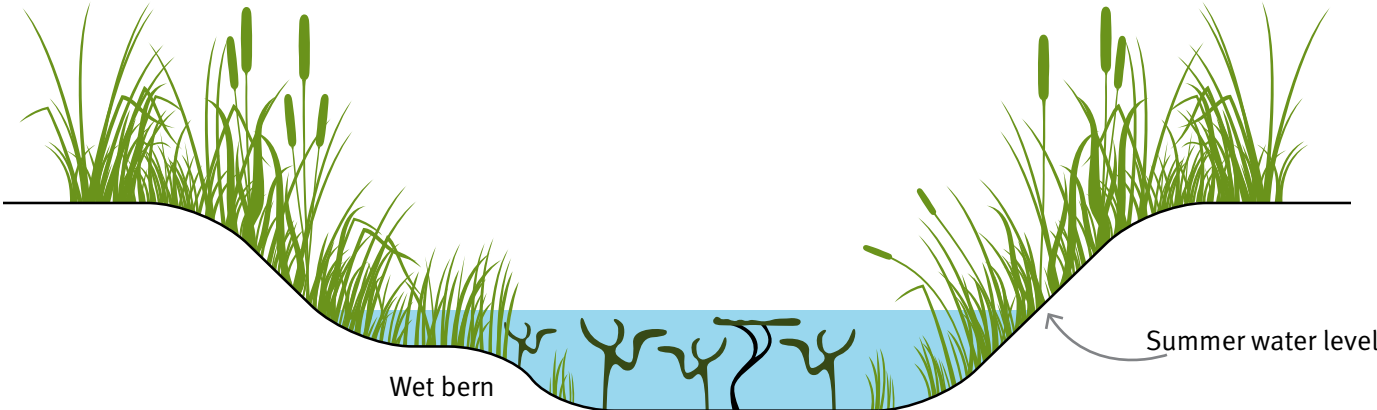
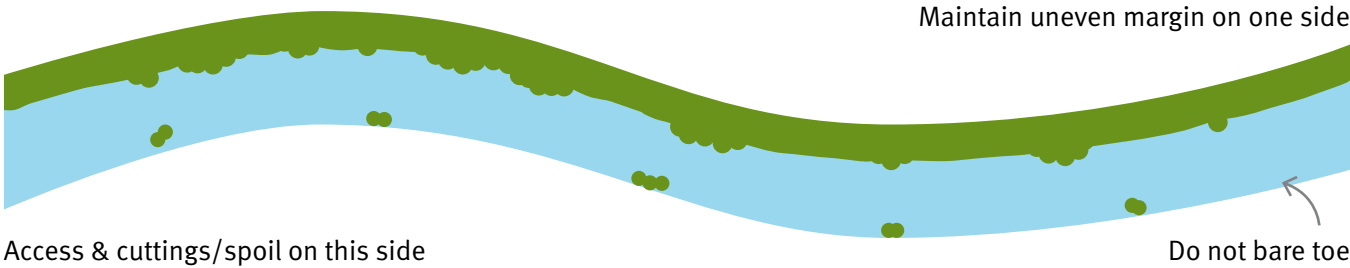
Do not cut aquatic (reed) fringes

Weedcuttings to be placed as far from the channel as possible

Do not expose toe or bank side soils by excessive cutting and avoid disturbance of bed material



**W7 Weed control**

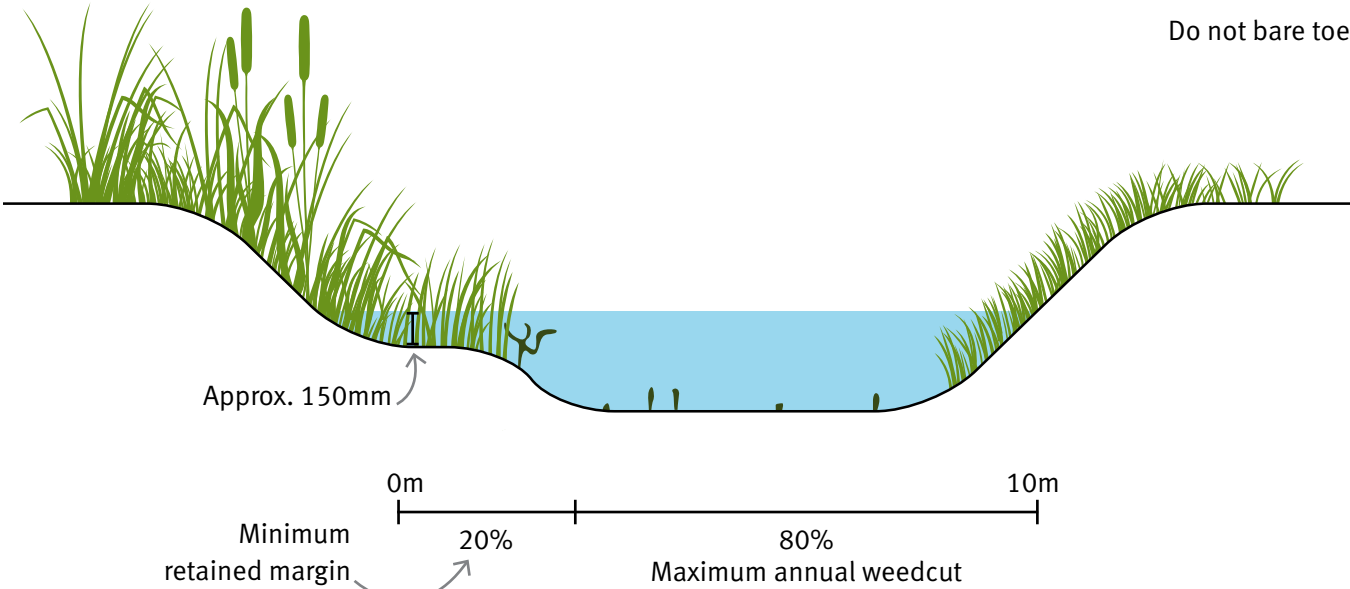


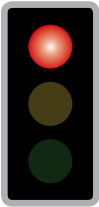
**No cutting or spoil on this side**

Channel width <10m = min, 10% of retained margin  
 Channel width 10m+ = min, 20% of retained margin

**THIS SIDE ONLY**  
**Annual maintenance access**

Weedcuttings to be placed as far from the channel as possible  
 Cut using a reciprocating blade on basket  
 Do not bare toe

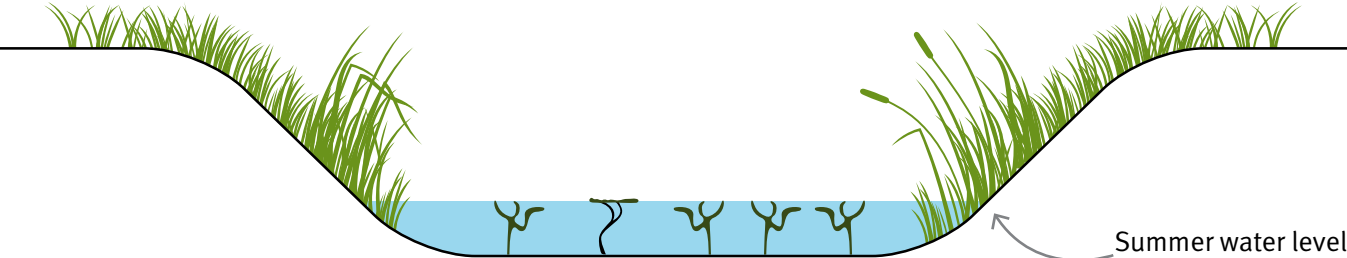




### WB1 Weed control

Use only where risk/limited capacity ditates. Look to enhance

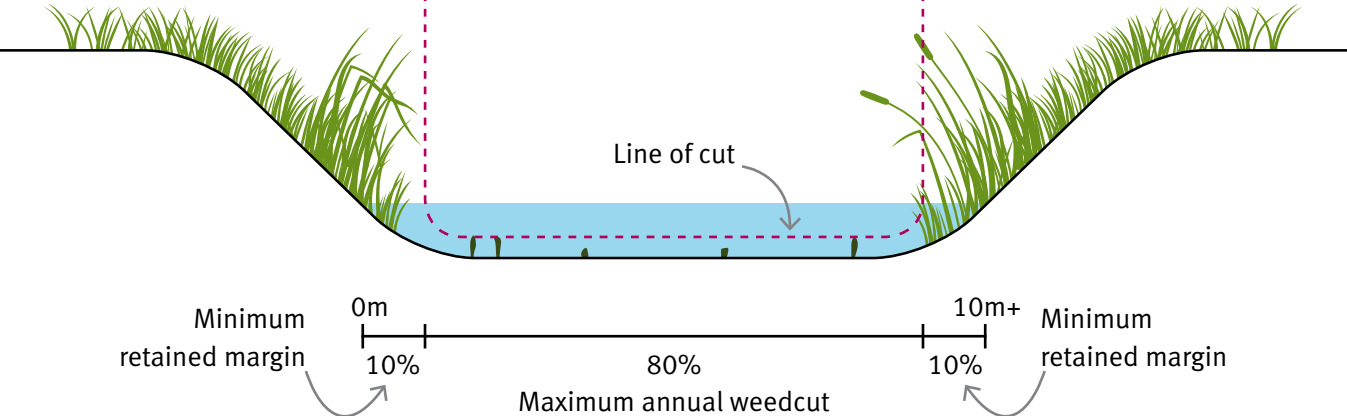
Use alternate bank for disposal where possible

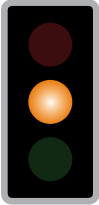


Channel width <10m = min 10% of retained margin  
 Channel width 10m+ = min 20% of retained margin

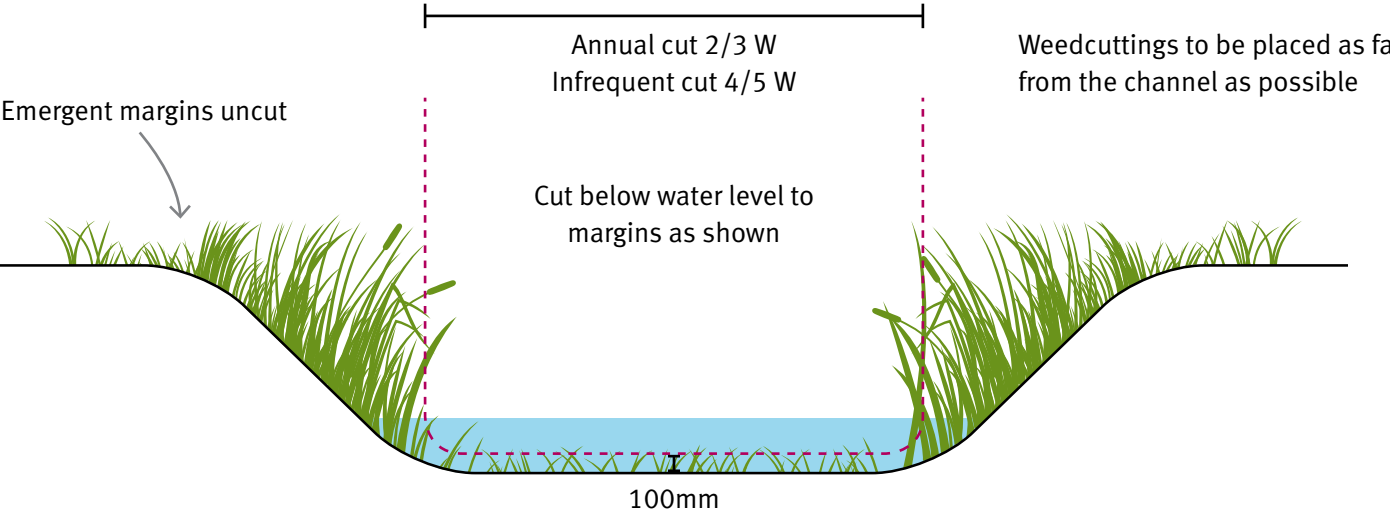
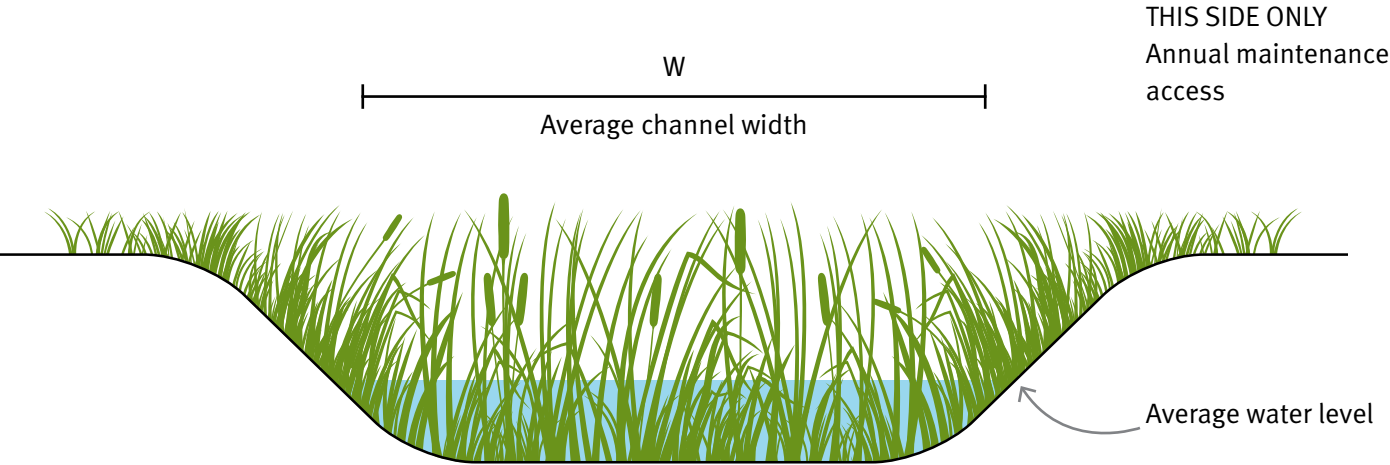
Cut and remove all weed in central 80%. Rake whole channel width to remove "loose" and floating weed, except through established reed beds.

Weedcuttings to be placed as far from the channel as possible  
 Cuttings removed to specified site or placed on bank NOT on margins

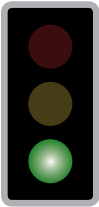




WB2 Weed control



Note: 'W' is designed wetted width of channel to provide indicative standard of protection



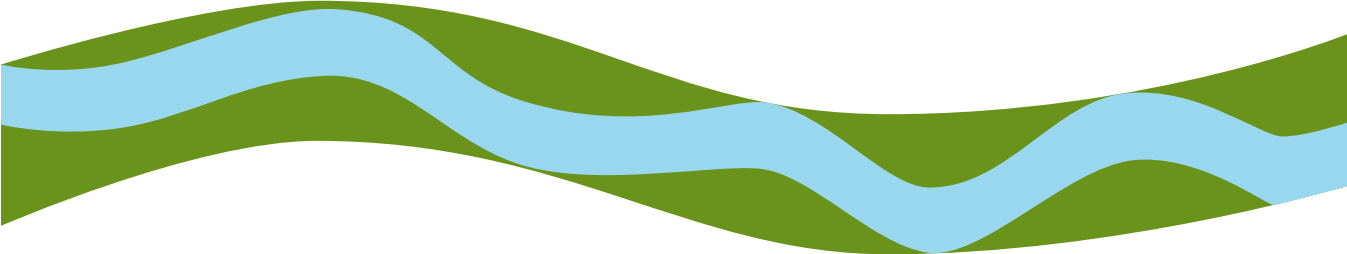
### WB2 (Plan) Weed control

No weedcutting shall take place between April and the beginning of July

#### Annual cut

Cut a meandering channel retain 33% (1/3) of vegetation

Maintain uneven margins



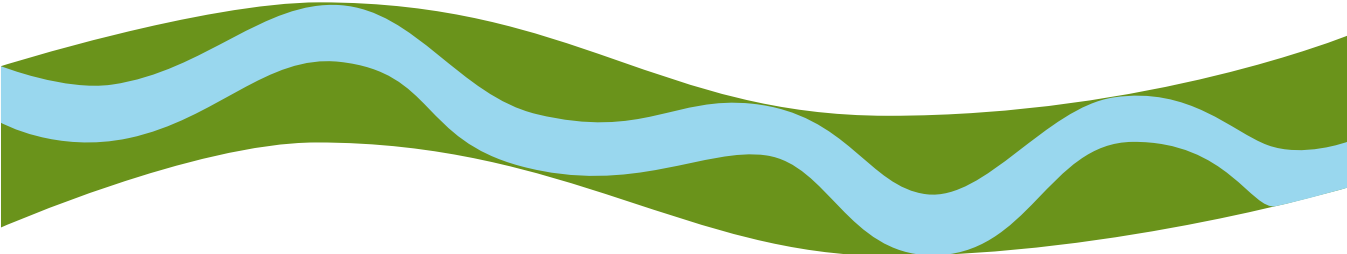
Access & cuttings on this side

Weedcuttings to be placed as far from the channel as possible

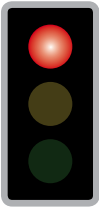
#### Infrequent cut

Cut a meandering channel retain 20% (1/5) of vegetation

Maintain uneven margins



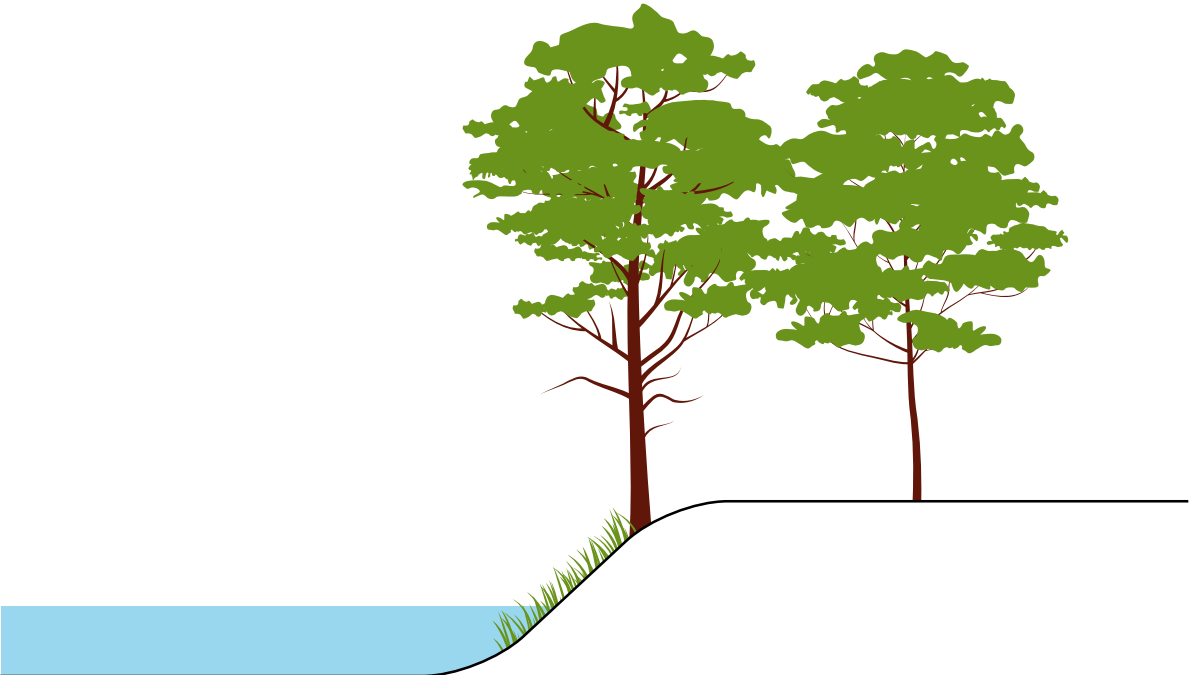
Access & cuttings on this side



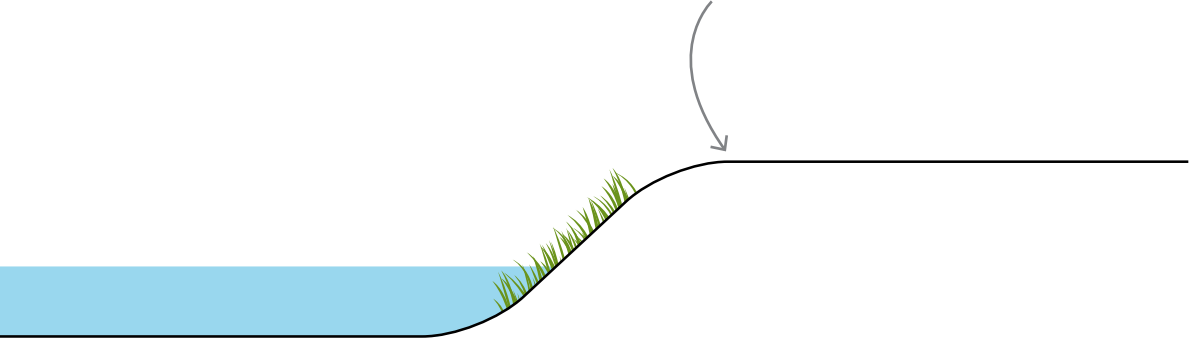
### TB1 Tree and bush management

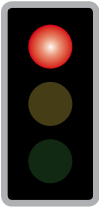
Tree and bush work can usually be undertaken between September and Mid-February, unless nesting birds are present.

Work should be phased over a number of years.



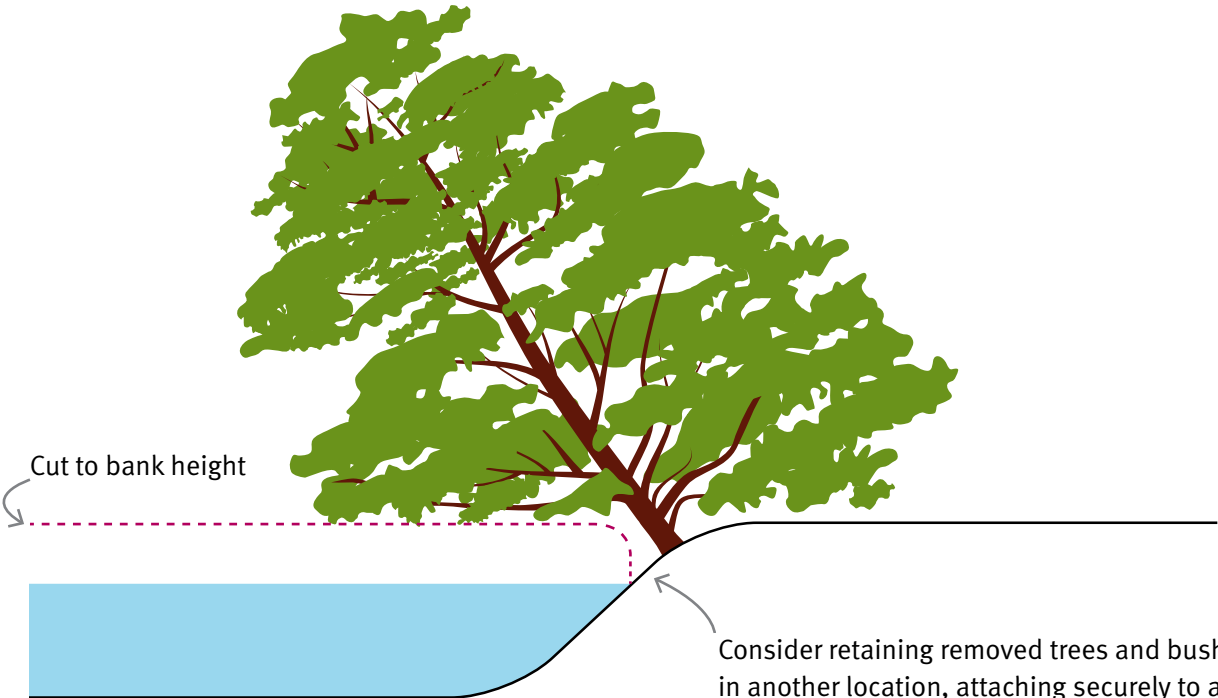
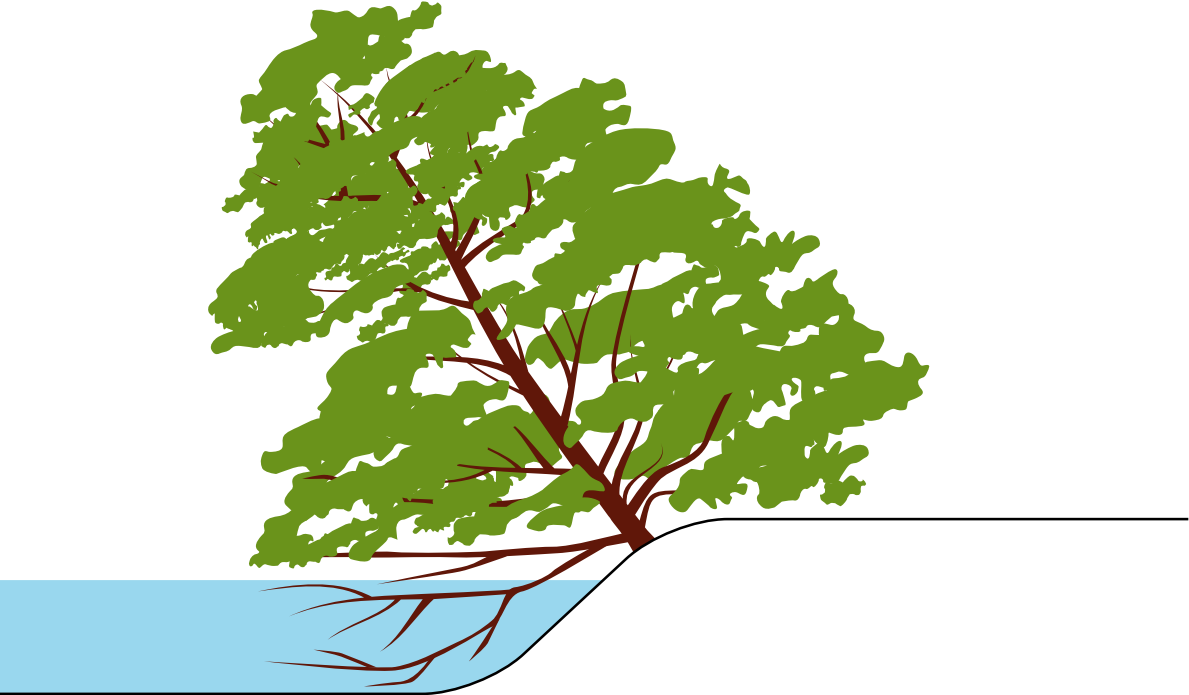
All trees and bushes to be removed from banks. Consider retaining trees and bushes for reuse in another location, attaching securely to a river bed to encourage river restoration

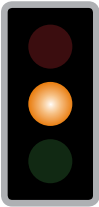




### TB2 Tree and bush management

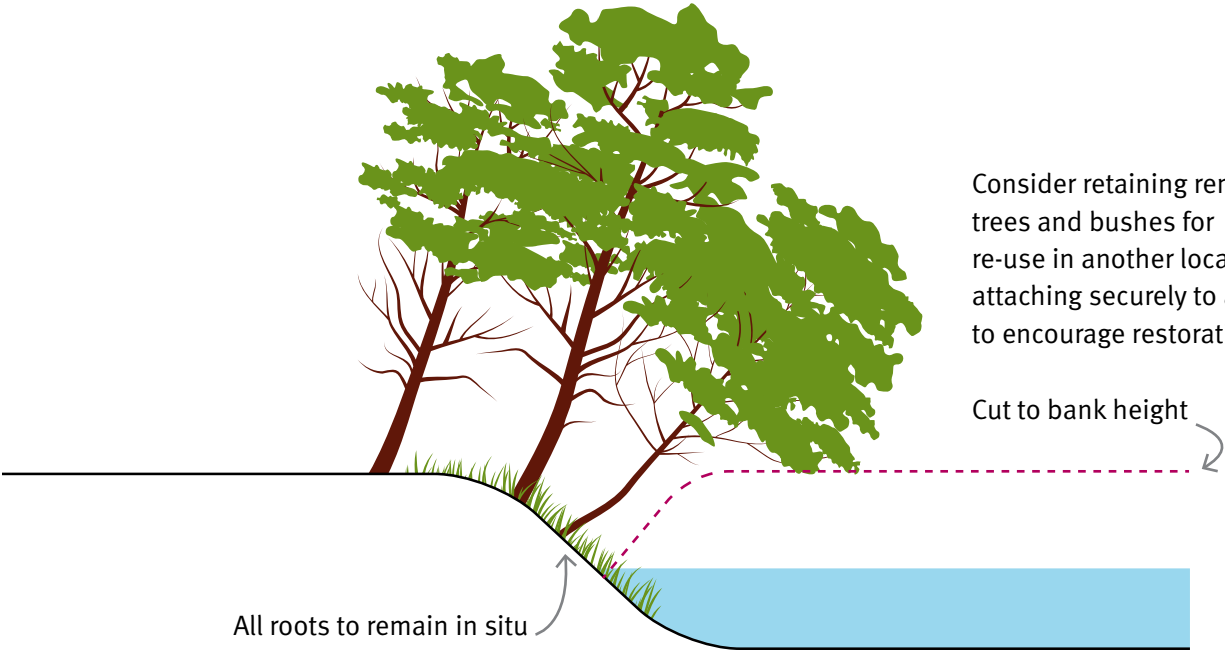
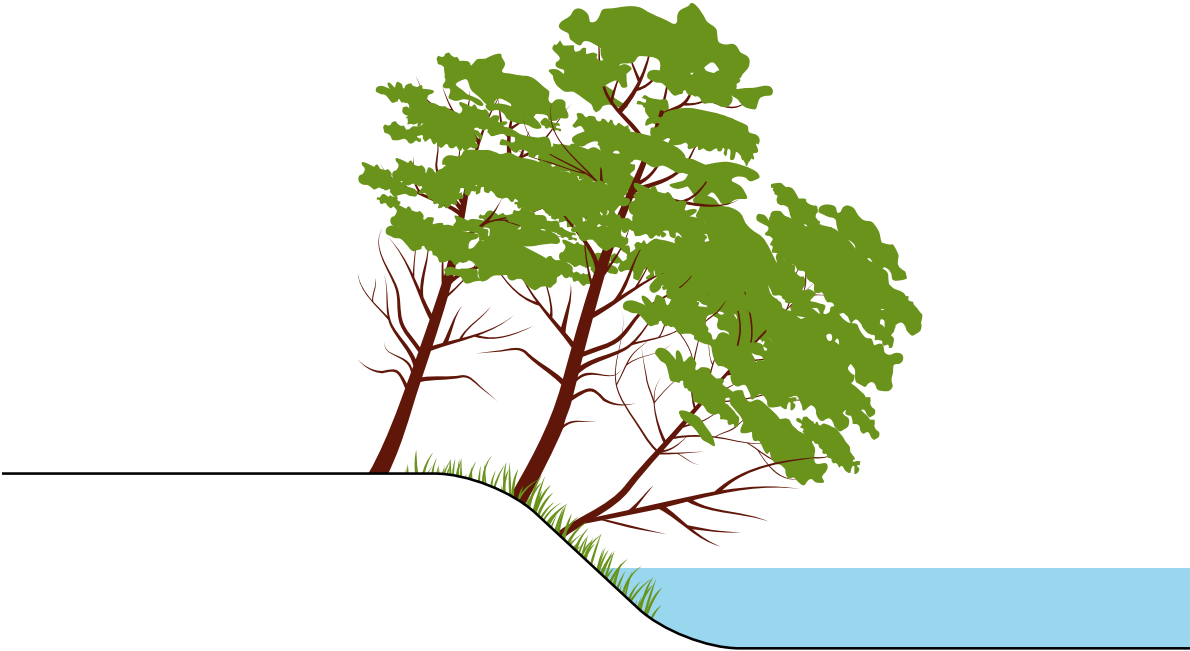
Tree and bush work can usually be undertaken between September and Mid-February, unless nesting birds are present.





### TB3 Tree and bush management

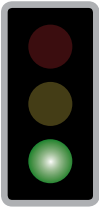
Tree and bush work can usually be undertaken between September and Mid-February, unless nesting birds are present.



Consider retaining removed trees and bushes for re-use in another location, attaching securely to a river bed to encourage restoration river

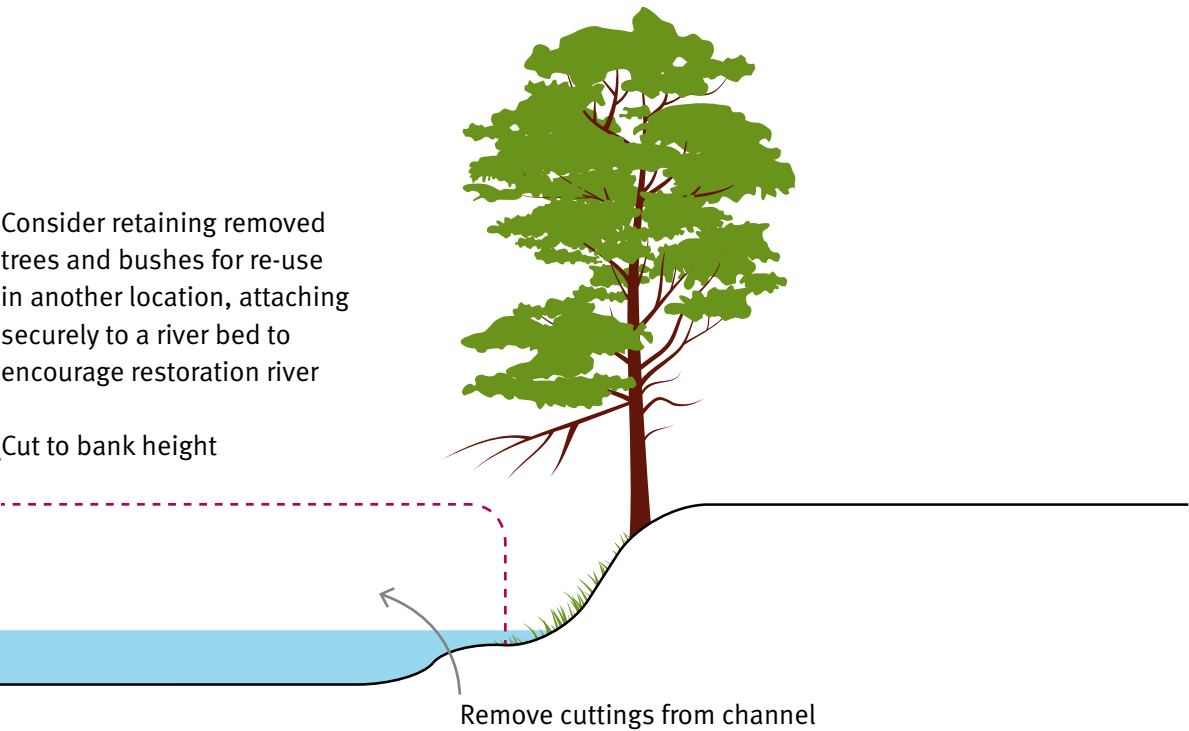
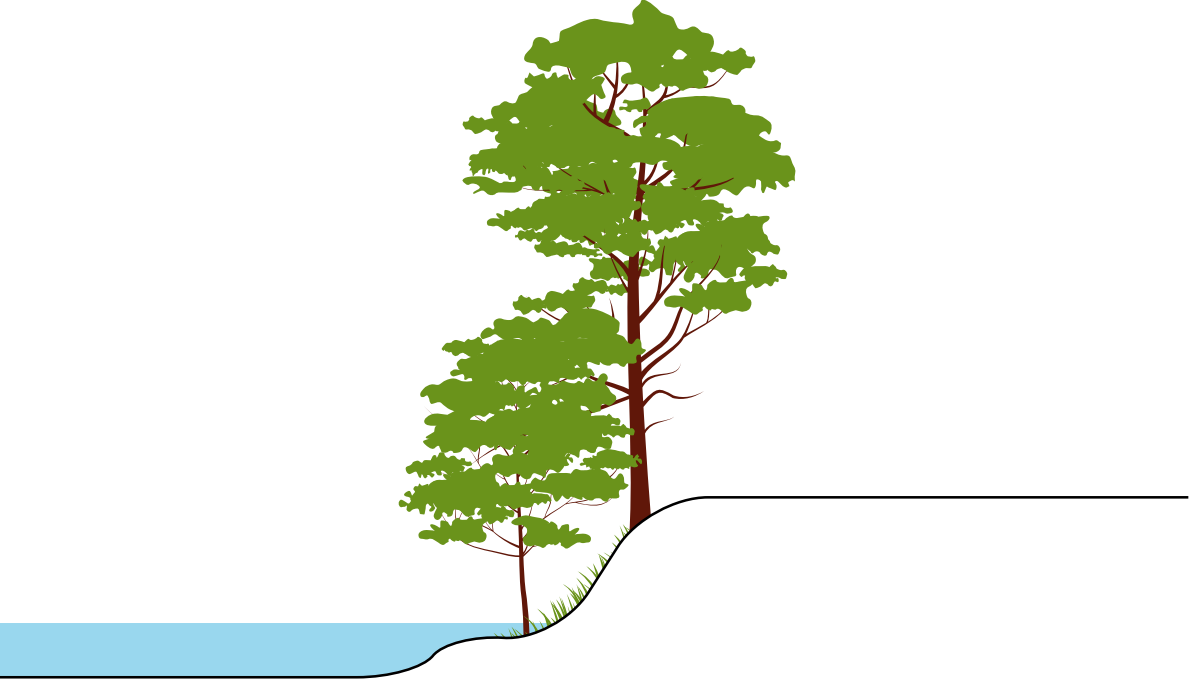
Cut to bank height

All roots to remain in situ



### TB4 Tree and bush management

Tree and bush work can usually be undertaken between September and Mid-February, unless nesting birds are present.



# New woody debris options

## Woody debris management

Woody debris (e.g. branches, large limbs of trees, root boles or entire trees) often fall into rivers. Historically we have removed woody debris to maintain flow conveyance and prevent downstream blockages. It is good practice to either retain or introduce new woody debris into river channels because it is a cheap and effective means of enhancing rivers for wildlife.

When deciding whether to retain or introduce new woody debris to a river channel you must fully consider whether it would be suitable in the river in question. There are four risk factors you need to consider:

- Flood risk – is your site in a low, medium or high consequence system?
- Risk of obstructing a structure downstream – is the site close to a bridge or culvert that could block if woody debris was dislodged?
- River channel depth – is the channel deeper than the height of the woody debris?
- Setting – is the site in an urban, parkland or rural location?

The matrix in Table below can be used to help decide whether woody debris should be retained/introduced into a river channel. In general, if two or more of your risk factors are coloured red, then consideration is needed as to whether woody debris should be installed/retained, and how it can be designed to minimise risk.

Woody debris risk matrix



Low Risk



Med Risk



High Risk

	Low Risk	Med Risk	High Risk
Flood risk	Low risk FRM system	Medium risk FRM system	High risk FRM system
Channel depth	Woody debris is half the height of the channel depth or less	Woody debris is the same height of the channel depth	Woody debris is higher than the channel depth
Site setting	Rural	Parkland	Urban
Risk of obstructing a structure downstream	Low	Med	High

## Retaining woody debris

Three new environmental options have been created to encourage retention of woody debris. Table above should be used to help decide whether to retain woody debris, in general woody debris should not be removed when there is no evidence that it is causing flooding risk or that it could cause a blockage.

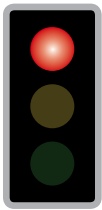
## Introducing new woody debris

The existing tree and bush management options (TB1 to 4) have been updated. When removing woody debris in one location, you are encouraged to keep the woody debris as it may be installed at a different lower risk site. **You must consult with your local Development and Flood Risk Team as Land Drainage Consent may be needed.** When moving woody debris from one site to another, check that the source material is free of disease and non-native invasive species. Appropriate Biosecurity measures must be taken when moving material between sites.

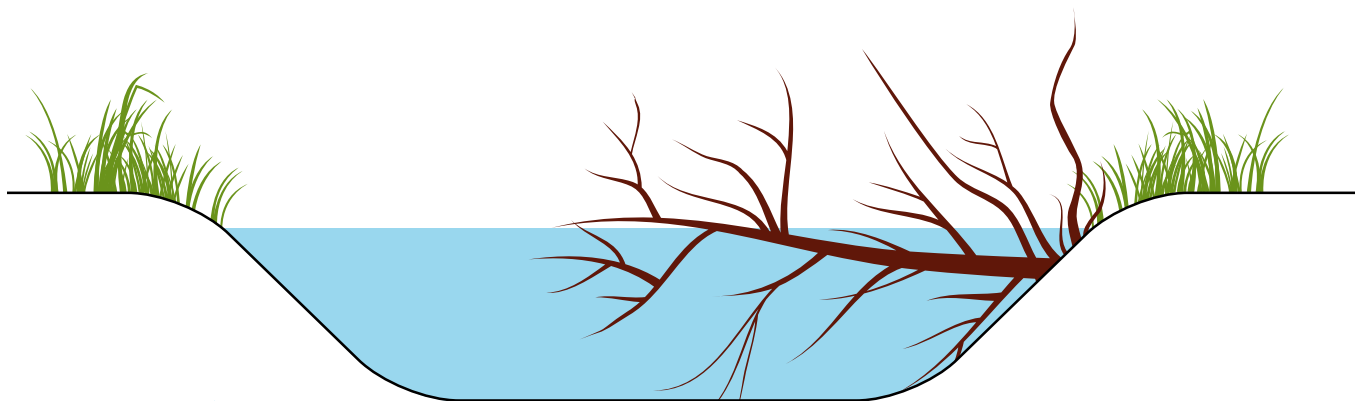
## Best practice

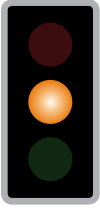
When retaining or installing woody debris the following best practice should be followed:

- selective (rather than wholesale) removal of woody debris.
- realigning the woody debris so that it is pointing in a downstream direction.
- repositioning woody debris away from culverts and bridges which are at risk of blockage.
- pegging the woody debris securely to the channel bed. This can be achieved by using ground anchors to secure the woody debris in place.
- ensuring that the woody debris' height is equal to or no greater than half the channel's depth.

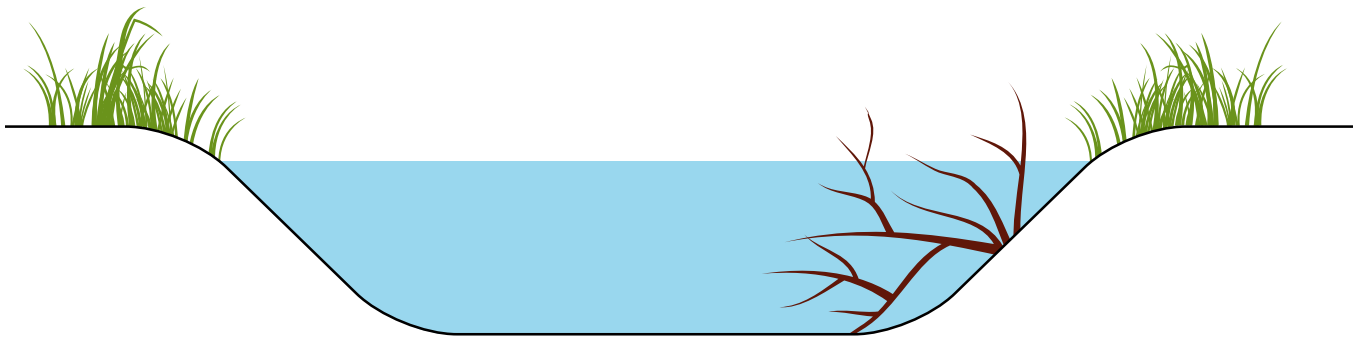
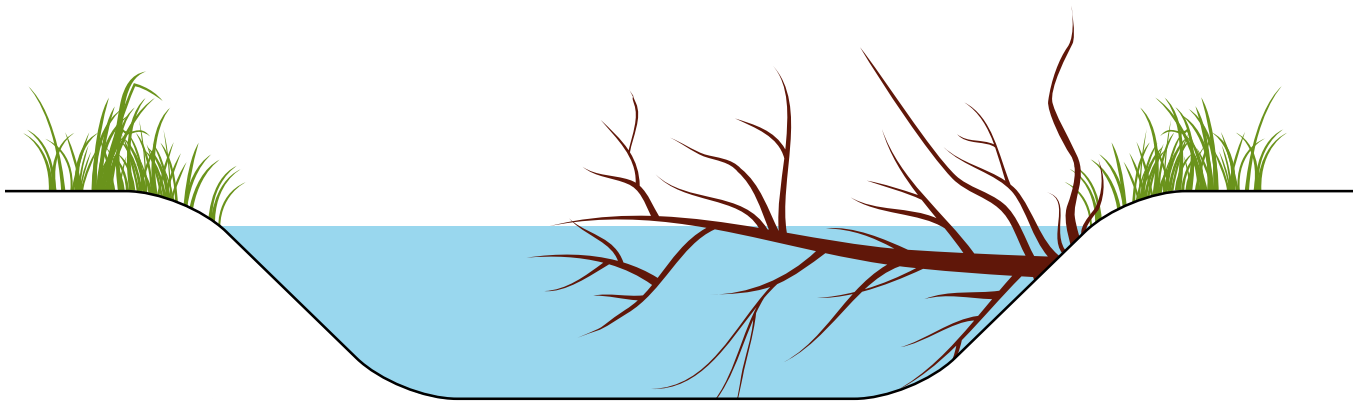


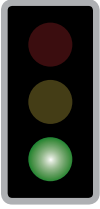
## WD1 Remove all woody debris





**WD 2 Selective removal of some woody debris and reorientation to enable conveyance through middle of channel**





**WD 3 Leave in all woody debris, and peg to the banks and bed of the channel**

