

Riverine Management—A Best Practice Approach When Carrying Out Activities in a Watercourse, Lake or Spring

A best practice approach promotes actions to enhance water and stream management outcomes—and where possible should be adopted. By following this document and complying with the outlined principles, the environmental consequences of an activity can be limited, infrastructure in and around the watercourse protected, and the effects of an activity on upstream and downstream users is negated.

This document outlines a number of best practice principles to be adopted when carrying out an activity in a watercourse, lake or spring. Activities such as destruction of vegetation, excavation or placement of fill in a water course may only be carried out where the correct permits have been granted or where there is an exemption from the requirement to apply for a permit.

Planning for an activity

- Where possible, any activity carried out in a watercourse should be timed to coincide with no or low flow or after a wet season, when the threat of flow events that may cause erosion is low.
- When carrying out an activity in a watercourse, limit the extent of the activity to that which is necessary and unavoidable.
- Limits of the proposed disturbance should be made visible on the activity site by clearly marking the ground or vegetation on the outer perimeter with flagging tape or paint. This assists contractors or others undertaking the activity to easily determine vegetation that can be destroyed, or the limits to any excavation or placement of fill.
- Where possible any water run-off should be diverted around areas of disturbance to minimise potential erosion and turbidity.

Debris and vegetation in and around a watercourse

- Provided the quantities are not excessive, wood debris is often best left in a watercourse in a manner that will not cause damage through erosion or diversion of flowing water. For example, fallen trees should be moved to align with the flow of water as this can slow down larger flows and potentially reduce erosion.

- Cleared vegetation (excluding weed species) in excess of in-stream needs should be mulched and used onsite to assist in rehabilitating disturbed areas by minimising weed growth, protecting planted vegetation and reducing sediment run-off.
- When cutting vegetation, cut near or at ground level to reduce impacts on stream flow but retain the root mass in the ground to maintain soil stability.
- Ensure mature and well established native trees are not destroyed in association with the clearance of any non-native vegetation (for example weed control).
- Areas of bank cleared of vegetation due to works should be revegetated with native trees, shrubs and grasses endemic (local) to the area.
- Ensure natural stream bed controls—or features that create natural waterholes (for example logs or rock bars)—are not lowered or removed.

Management of bed and bank stability

- To stabilise the bed and bank, use measures such as rock revetment, reinforced matting and large woody debris, log piling or similar methods.
- Stabilise cleared banks before clearing any adjacent areas.
- Keep the number of bank cuttings and fills required to a minimum when carrying out an activity.
- Use naturally occurring fill to return a bank profile to pre-disturbance condition or to backfill around in-stream structures.
- When placing fill in a stream bed ensure it does not redirect the flow of water into a bank.
- Do not lower or destabilise natural waterholes in the bed of the watercourse.

Minimising erosion and reducing sedimentation

- Where possible, activities should not be carried out on the outside of a watercourse bend, on steep banks or where the soil type is prone to erosion. For example, from abrupt changes in flow direction caused by a structure, fill excavation or fallen vegetation can cause scouring and should be avoided.
- Protect bare surfaces exposed by an activity from weathering, rain drop impact and water run-off.

- Use sediment traps to capture any sediment generated by activities. This will minimise water turbidity outside the activity site.
- Where available, an existing access track and the stream bed should be used to get to the activity site instead of constructing a new access track.
- Access tracks and crossings should not interrupt low flow along the watercourse. They should be at the natural bed level or include culverts or pipes that allow flow at the natural bed level both upstream and downstream of the crossing.
- Where practicable alignment of cuttings into the bank for crossings and access tracks should be oriented downstream.

Infrastructure and the use of machinery in a watercourse

- Machinery used in carrying out an activity should be selected to achieve minimal disturbance of the site—that is, the size is fit for the purpose and not larger than required.
- Ensure all machinery used to carry out an activity is stored, refuelled and maintained outside the outer banks of the watercourse.
- Support poles and towers for overhead pipe and cable crossings should not be placed within the low flow channel or upon bank edges.
- Ensure submerged pipe and cable crossings are buried below the potential scour depth for the underlying bed material. For example, in sand substrate, scour depth is equal to bank-full depth, and in gravel streams it can be greater than two metres.
- Drainage and discharge structures should be constructed so they do not alter the natural bed and bank profile and, where practical, should be aligned perpendicular to the direction of water flow.
- Structures should be positioned on straight reaches of watercourse and not on the bends of the watercourse. The alignment and shapes of structures should also be chosen to minimise the potential for scour.
- If culverts are required, box culverts should be used in preference to circular pipes.

- Where culverts are required, the cement base and apron should:
 - mimic the substrate found naturally in the surrounding bed substrate
 - be of a sufficient size to ensure uninterrupted low flows
 - minimise the occurrence of blockage of culverts caused by flood-borne debris.
 - Be oriented perpendicular to the stream channel $\pm 10^\circ$.

Further information

If you have questions regarding best practice riverine management principles for your situation, you are encouraged to contact your local DERM office for advice. Where the activity is substantial or there is a risk of erosion or damage to infrastructure it is recommended that the service of a Registered Professional Engineer Queensland (RPEQ) is engaged for the design and supervision of the activity.

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For general enquiries contact the
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 or visit www.derm.qld.gov.au