2025



ROAD MAINTENANCE CODE OF PRACTICE

FOR THE WET TROPICS WORLD HERITAGE AREA

WET TROPICS MANAGEMENT AUTHORITY

PATRIMONIO MUNDIAL • WORLD HERITAGE • PATRIMOINE MONDIAL

Queensland Government

THIS CODE OF PRACTICE SHALL BE FOLLOWED BY ALL PERSONS UNDERTAKING ROAD MAINTENANCE ACTIVITIES IN THE WET TROPICS WORLD HERITAGE AREA FOR THE DEPARTMENT OF TRANSPORT AND MAIN ROADS (TMR). THIS CODE IS A LEGAL REQUIREMENT OF THE WET TROPICS MANAGEMENT PLAN 1998.

What is the Road Maintenance Code of Practice?

This Road Maintenance Code of Practice (the Code) outlines best workplace practices to achieve desired goals in the Wet Tropics World Heritage Area (WTWHA). It outlines requirements necessary to achieve best practice road maintenance that minimises negative environmental impacts on the WTWHA. This Code has been developed through consultation with the Wet Tropics Management Authority (WTMA), TMR environmental specialists, engineers and work crews (refer Appendix A).

How to Use this Code of Practice (Code)

This Code is divided into seven sections based on types of maintenance works in TMR's Road Maintenance Performance Contract (RMPC). Each section categorises RMPC activities and provides requirements to minimise negative environmental impacts on the WTWHA (Requirements). These sections are:

Emergent Works page 8

Roadside Works page 14

Bridge Works page 26

Drainage Works page 32

Road Furniture Works page 41

Sealed Road Surface Works page 47

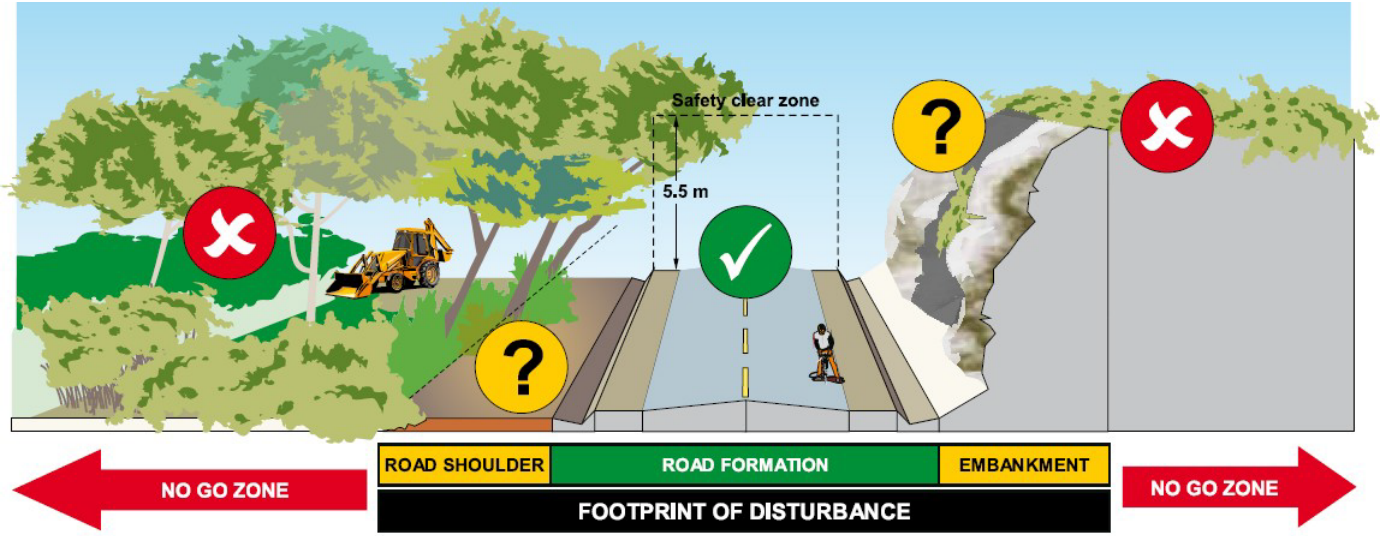
Non Surface Disturbance Works page 52

Before starting work:

Refer to the relevant section based on the RMPC activities you are to undertake.

1. Refer to FIGURE 1 to determine if works will be within the 'footprint of disturbance'. Should works go outside the road formation you shall contact your TMR Environmental Officer (EO) who may then discuss with the Wet Tropics Management Authority (WTMA).
2. Follow the 'Requirements' in the relevant section of this Code.

FIGURE 1



✓	Works that remain within the road formation will not impact natural values and are able to be undertaken in accordance with this Code of Practice. Works in these areas (i.e. within the Road Formation) is permitted without further consultation. Activities include: pavement edge repair; surface correction; pothole patching; resealing; crack treatment with emulsion/aggregate; profile planning, scarifying, asphalt overlaying, surface sweeping; surface debris removal; line marking.
?	Works in areas that are within the footprint of disturbance, but off the road formation, may impact natural values and will require further consideration. Before undertaking works in these areas, please discuss proposed activities with a TMR Environmental Officer. Potential impacts on the natural values of the WTWHA may need to be discussed with WTMA.
✗	Works in the "No Go Zone" areas are outside the 'footprint of disturbance' and are not permitted under this Code of Practice. Generally permits would be required for any activities (e.g. developing side tracks) in these areas that might impact natural values such as vegetation, soil or water.

What is the Wet Tropics World Heritage Area?

The Wet Tropics World Heritage Area (WTWHA) is an area of approximately 900,000 hectares (ha) between Townsville and Cooktown including rainforest, mangrove forest and eucalypt forests. The area has been included on the World Heritage List due to its important natural values that have been recognised as having international significance. The WTWHA is also important for its diverse cultural history and significance to indigenous Australians. It is one of the world's most diverse areas of animals and plants. It is home to 30% of Australia's marsupials; 25% of Australia's frogs; 62% of Australia's butterflies and approximately 50% of Australia's birds. Land features, plants and animals found in the WTWHA provide scientists with a record of how the earth has evolved. There are plant species in the WTWHA that have existed for millions of years.

Why does TMR need a Code of Practice?

1. **A Code of Practice is a requirement of a permit authorising the conduct of maintenance works within the WTWHA. This permit is issued to TMR by the Wet Tropics Management Authority (WTMA) (refer Appendix A).**
2. **Roads impact on the values of the WTWHA by:**

Creating a barrier to animal movement (e.g. many tree dwelling animals cannot cross roads). This barrier can mean that groups inbreed and/or that food and breeding areas cannot be reached.

Creating disturbed areas that allow weeds and pests to establish (e.g. toads invade weedy grasses along roadsides). Weeds and pests compete with native species for habitat and food. They can also change conditions so areas along roads are no longer suitable for some local native species (e.g. weedy areas promote fires that cause changes to vegetation types).

Creating areas where erosion is increased (e.g. high rainfall can continually erode steep cuttings in erosion prone soils common in the WTWHA). Erosion causes loss of topsoil and land area. Erosion can also cause sediment build-up in waterways, affecting habitat values and restricting animal movements and sometimes even killing aquatic animals. Runoff from roads can carry contaminated water from traffic and other sources (e.g. petro-chemicals emitted from vehicles). Contaminated water travels along road surfaces and table drains to waterways where it may harm and sometimes kill native animals and plants.

Causing animal deaths due to vehicles (e.g. the survival of Mission Beach cassowaries is threatened by road kills). As the number of road kills increases, the biodiversity of the WTWHA is reduced.[3.]

Affecting areas of historical value or other significance to people or lifestyle. Effects may be direct by physically altering a site or indirect by affecting its quality (e.g. noise).

Changing conditions of natural areas next to roads (e.g. road noise can be detected more than 100 metres into a forest). The gap in a forest caused by a road allows sunlight to enter. This light can change the plants growing some distance into the forest. Also, noise, dust and lights from traffic can disturb plants and animals within forests beside roads. The 'edge affected' forest beside roads adds up to a significant proportion of the WTWHA.

3. Roads present the WTWHA to the community and tourists. Well maintained roads enhance the visual values of the area.



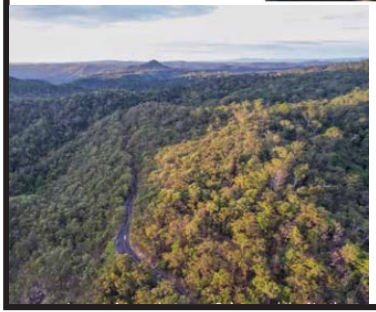
Road kills decrease the biodiversity of the WTWHA.



Roads present the WTWHA to the community and tourists.

The Rainforest Aboriginal people of the WTWHA have the oldest rainforest culture in the world.





Roads create a gap in the forest. This gap changes conditions in the area by letting light enter. Gaps also create a barrier to animal movement. Canopy connectivity helps to reduce these impacts.
Canopy connectivity can also help make the driving experience pleasant.

Requirements to Minimise Negative Environmental Impacts from Road Maintenance on the WTWHA



Avoid disturbance

- Avoid disturbance to sensitive or significant areas (e.g. cultural heritage; rare plants)
- Minimise clearing and unnecessary damage to vegetation
- Maintain canopy connectivity
- Minimise sediment washing into waterways
- Minimise noise, dust and light
- Seek specialist advice on managing vegetation



Rehabilitate disturbed areas

- Conserve, protect and reuse weed-free topsoil
- Stabilise to prevent erosion
- Promote the growth of native plants
- Seek specialist advice on rehabilitation methods



Maintain animal corridors and habitat

- Maintain canopy connectivity (especially at water courses)
- Minimise sediment washing into waterways
- Maintain fauna furniture (e.g. animal crossings, such as culverts and rope bridges)
- Seek specialist advice about avoiding animal breeding areas and ensuring the success of animal crossings



Prevent contamination

- Manage waste
- Contain chemicals
- Clean up spills



Prevent weed spread

- Wash down vehicles and equipment before undertaking works in WTWHA
- Avoid the introduction of weeds in materials
- Seek specialist advice on weed treatment



Minimise visual impact

- Cover graffiti
- Remove waste and tidy site
- Consider visual impacts of new features

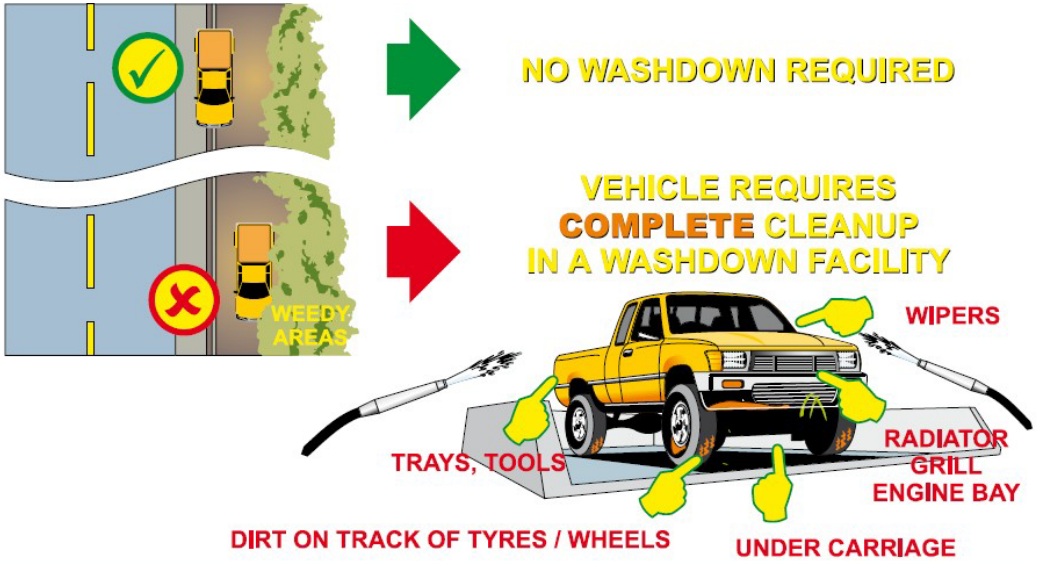


Identify Potential Problems

- Notify TMR foreman and environmental officer about potential issues (e.g. weeds; dieback; myrtle rust; cultural heritage discoveries)

FIGURE 2

PREVENT WEED SPREAD

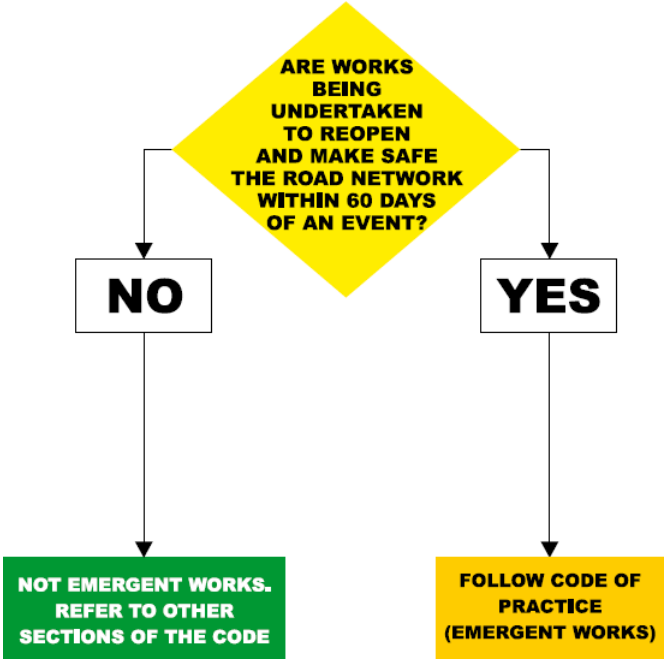


WASH-DOWN VEHICLES OR MACHINERY TO REMOVE WEED SEEDS/CUTTINGS IF VEHICLES LEAVE THE ROAD FORMATION OR GO THROUGH WEEDY AREAS.

Wash down is a thorough process of cleaning all areas of vehicles and machinery that may catch weeds and weed seeds. Wash down must occur in a dedicated area where runoff can be contained and weeds treated.

EMERGENT WORKS

This section defines emergent works on roads and how such works shall be managed to minimise impacts to the WTWHA.



What are emergent works?

Emergent works are not defined under Queensland legislation. However, TMR has determined that emergent work is any work required to protect people's lives and health. These are unplanned (or first response) works that have arisen from an emergency situation. Emergent works can include response to land slips and tree fall as a result of storm events. The response to large scale emergencies such as a cyclone can be particularly challenging.

It includes work which is necessary to reopen or make safe any transport infrastructure. Also included is improvement of transport infrastructure, where the primary purpose is for repairing the infrastructure; works outside the transport corridor are permitted should these works be essential for the repair. It does not include works to improve the efficiency and/or enhancement of transport infrastructure, where the primary purpose is not to repair the infrastructure. Similarly, once the corridor has reopened, emergency works do not include RMPC maintenance activities as described in this Code. TMR's definition is supported by Section 27 of the *Wet Tropics Plan 1998* where a person may carry out any activity for the protection of life

and/or the urgent protection of property in all WTWHA management zones. For the purpose of this Code, this includes works to reopen and make safe the road network within 60 days of an event. All works must be undertaken in accordance with the principles of "Keep the Trees, Please" (refer Appendix F).

Emergent works include:

Landslip management

- vegetation trimming, clearing and removal
- scaling of loose rocks and soil
- installation of infrastructure for the stabilisation of batters

Fallen, damaged and dangerous vegetation - clearing and trimming

- removal or mulching

Temporary installations - -

road bunding

- temporary barriers
- temporary side tracks

Clean up

- management of fuel / chemical spills
- soil removal
- roadside sweeping

Requirements

Note that this Code does not consider Emergency Management Queensland or Queensland Police Service requirements. TMR shall implement advice received from appropriate authorities.

Contact a WTMA officer and advise of the emergency event and the management regime implemented and organise a site inspection as soon as possible. It is acknowledged that often in an emergency situation contact with WTMA will not occur until emergency management activities are underway or complete. Be mindful that the extent of works to reopen and make safe the road network still needs to be done in a manner that minimises environmental impact and avoids damage to the World Heritage Area's natural values.



Avoid Disturbance

- Clear only vegetation that is essential to reopen and make safe the road network, with special attention to limiting the clearing of large trees, maintaining canopy connectivity and limiting edge effects (FIGURES 1 and 4).
- When scaling batters clear only the minimal area that is essential to reopen and make safe the road network.

- Locate stockpiles, plant turn around sites or storage enclosures within the road formation and the already disturbed area, where possible.
- Match the machine size to the job.



Prevent Contamination

Manage fuel and chemicals

- Where safe, prevent contamination of waterways and adjacent habitat by containing spills. This may be undertaken by isolating the spill in the table drain, as close to the source as possible, and may require the dumping of soil to act as a containment structure.
- Where applicable and safe, use a hydrocarbon boom.
- Determine the appropriate absorbent and management regime for spills Ensure a fit-for purpose spill kit is available.
- Where applicable, truck the spilled material and/or absorbent to an approved disposal site. Do not push spoil material over embankments.
- Report all spills in watercourses to **DETSI** (refer Appendix G).
- Prevent contamination of waterways and land by containing fuels and other chemicals.
- Store chemicals outside of the WTWHA if possible.
- Ensure storage sites are a minimum of 100m away from watercourses.
- Ensure all chemical containers (including fuel drums and paint tins) are in a watertight enclosure (e.g. bunded pallets and drip trays). The enclosure needs to be large enough to contain 110% capacity of the chemicals it is containing (e.g. a 100 litre drum should be contained within an enclosure able to hold 110 litres). This will prevent overflow during rainfall and conforms to the Australian Standard AS1940.
- Capture and remove all grease, oil, lubricants etc when maintaining or refuelling machinery within the WTWHA.

Manage Vegetation/Waste

Generally, fallen or cut **vegetation** should be recycled back into the vegetation, either by placing the vegetation on the forest floor being careful not to damage other standing vegetation or by mulching. Vegetation cannot be removed from the WHA without the consent of WTMA.

- Mulch manageable sized vegetation trimmings (not weeds) and return to adjacent vegetated areas, where possible.
- Manage larger logs by undertaking the following, where possible:

1. Place logs in adjacent areas to provide animal habitat without disturbing existing vegetation. If it is not possible to return large logs to the adjacent area discuss with WTMA where the logs might be able to be stockpiled.
2. Remove logs from areas with steep slopes, where logs may roll and damage adjacent vegetation.
3. Remove logs from areas where they may be a safety risk to motorists.

- Remove non-vegetated waste such as earth and rocks to an appropriate site (e.g. landfill). Seek advice from **TMR** Environmental Officer, if required. Transport waste in a covered skip or truck to an appropriate disposal facility.

Rehabilitate Disturbed Areas

All areas disturbed by works to reopen and make safe the road network after emergent events shall be rehabilitated. When undertaking rehabilitation, consider the following:

Seek advice

- Seek advice from a **TMR** Environmental Officer regarding the appropriate rehabilitation methods.

  Note: Different areas and situations require specific treatment and specialist advice can be obtained regarding the best approach to rehabilitate sites.

- Refer to Appendix **B** for surface stabilisation and revegetation guidelines. Rehabilitation can involve surface stabilisation against erosion and revegetation or surface stabilisation only.

Post-disaster cleanup - best management practices

A natural disaster such as a tropical cyclone (TC) can cause significant damage to road infrastructure. It is recognised that roads must be opened quickly to allow access for residents and emergency vehicles. However, the cleanup must be done in a way that acknowledges and protects the natural and cultural values of the Wet Tropics WHA.



•Cultural heritage may comprise tangible and intangible components of the landscape. Any works involving the disturbance and removal of fallen vegetation or spoil from landslips must be done in consultation with the appropriate Traditional Owners. Consideration must be given to disposal of vegetation and landslip spoil as close as possible to where it was generated ('on Country' is preferred).

•Landslip spoil must not be pushed over the road verge or against vegetation. Road spoil may be disposed outside the WHA if approved by the Authority (and in consultation with the appropriate Traditional Owners) or temporarily placed in a designated disposal area approved for the road. Appropriate erosion and sediment control measures must be installed around temporary stockpiles; these controls must be monitored and maintained.

•As quantities of vegetation after a TC are likely to be large and mixed with debris, it will generally be impracticable for this vegetation to be disposed of in the surrounding area. As with road spoil, vegetation may be disposed outside the WHA if approved by the Authority (and in consultation with the appropriate Traditional Owners) or temporarily placed in a designated disposal area approved for the road.

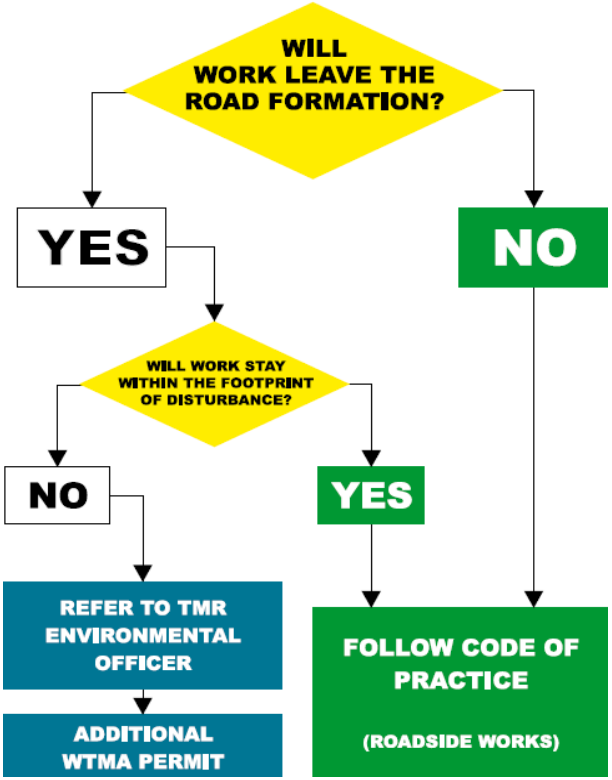
Post-disaster cleanup - best management practices

•Standing vegetation requiring removal for construction or safety reasons can only be removed with the approval of the Authority.

•Large woody debris and boulders immediately adjacent to bridges and causeways can be removed and disposed as above. However, material upstream and downstream of the waterway crossing that does not impact on the crossing must be left in-situ.

Once emergency works have been completed, long-term engineered stabilisation of the road may require approvals from the Authority.

ROADSIDE WORKS



What are 'Roadside Works'?

"Roadside Works" includes any maintenance activity off the road formation but within the 'footprint of disturbance' (FIGURE 1). Landslip Management has been included in this Section for low risk sites (i.e. landslips which are less than 3m high and 50m long) and within the original footprint of disturbance (i.e. when the road was constructed). Installation or repair of road furniture is covered in the 'Road Furniture Works' chapter. "Roadside Works" includes:

- Vegetation Management / Rehabilitation
  - Slashing and mowing
  - Trimming vegetation
  - Spot spraying or wick application of herbicide
  - Seeding or planting
  - Mulching
- Batter stabilisation* Landslip management Fallen trees
  - Vegetation trimming, clearing and removal
  - Scaling of loose rocks and soil
  - Installation of make safe techniques for stabilisation Soil and rock removal
- Visibility Clearing -
  - Trees Earthworks

- Tidying

  Litter collection
  Graffiti removal
  Roadside sweeping

  Servicing rest areas
  and driver reviver sites

* TMR routinely inspects batters to assess their stability and potential to adversely impact life or property. This is especially relevant given the geographic and climatic conditions that prevail in the WTWHA.

Requirements



Avoid Disturbance

Minimise clearing

- Do not go outside the 'footprint of disturbance' (FIGURE 1)
- Do not source gravel and water supplies from the WTWHA.
- Talk to TMR Environmental Officer if you:
- believe the work could create disturbance beyond the road formation (i.e. the outer edge of the table drain) (FIGURE 1).
- need to clear roadside vegetation (alive or dead) that obstructs visibility or is a safety threat (FIGURE 1, 3 and 4).
- need to undertake works on batters.
- Clear only vegetation that is essential to undertake works, with special attention to limiting the clearing of large trees, maintaining canopy connectivity and limiting edge effects (FIGURE 1 and 4). Consider animal crossing and breeding areas (e.g. known cassowary crossings).
- Minimise the upslope disturbance when scaling batters of loose material (i.e. soil and rock) within the 'footprint of disturbance'.
- Do not trim tree branches with a sidearm slasher (FIGURE 5).
- Avoid mowing if possible. Note: Mowing encourages grasses, spreads weeds and can kill native herbs and shrubs that do not regrow as quickly.
- Encourage low growing native plants on roadsides.

  Note: This can reduce maintenance work.
- Match the machine size to the job.
- Locate stockpiles, plant turn around sites or storage enclosures within the road formation (i.e. already disturbed area).

  Note: Placing stockpiles at the base of trees can kill them by preventing oxygen from reaching the tree roots.
- Restrict parking of vehicles and machinery to the road formation.

  Note: If vehicles leave the road formation, strict washdown of vehicles will be required to prevent weed spread (FIGURE 2 at front of Code).

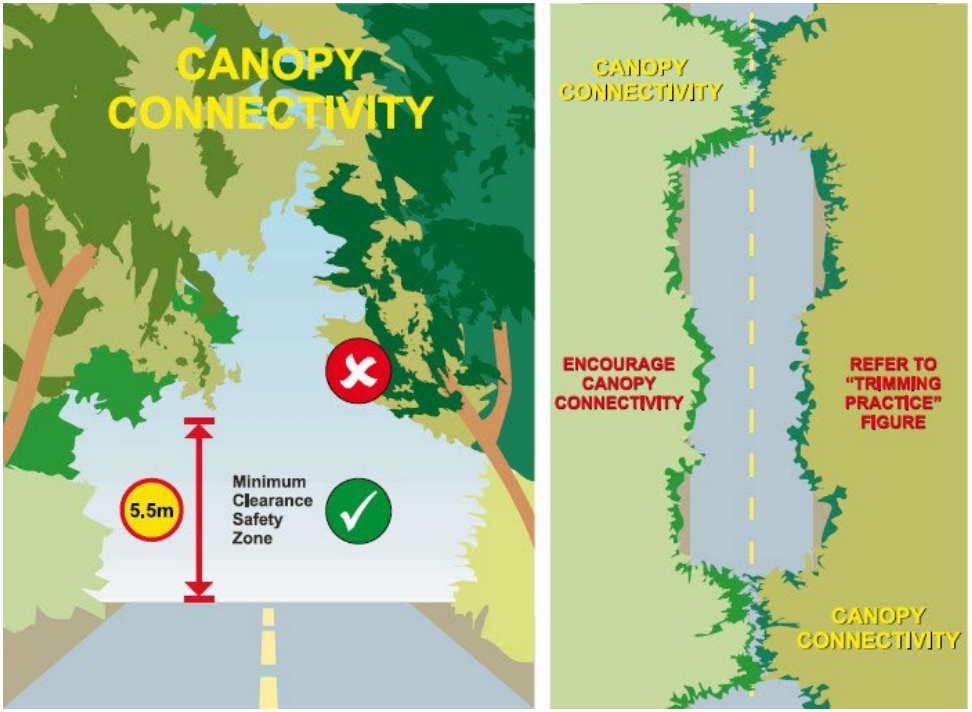
FIGURE 3

MAINTAIN VISIBILITY



FIGURE 4

MAINTAIN CANOPY CONNECTIVITY



Debate between stakeholders regarding the maintenance of canopy connectivity is acknowledged, however this Code of Practice requires that canopy connectivity be encouraged in all areas with consideration of the minimum clearance zone requirements

FIGURE 5

TRIMMING PRACTICE



Maintain canopy connectivity

In addition to assisting animals to cross roads, canopy connectivity can reduce "edge effects" (such as increased light, heat, noise and reduced humidity). Edge effects change the habitat for native plants and animals and can encourage non-native species such as weeds or grasses which can support feral animals.

- Trim trees manually so they are 'trained' to grow above vertical 5.5m clear zones (FIGURES 4 and 5). Note: Training trees can reduce maintenance (e.g. 3-5 yearly as opposed to 6 monthly to annual attention).
- Do not trim branches with a sidearm slasher or flail mower as this damages the vegetation, leaving shattered branches that make the plant susceptible to disease.
- Do not remove canopy closure from around watercourses if possible.

Minimise noise, dust and light

- Minimise noise in the WTWHA (e.g. fit engine guards on machinery).
- Minimise dust that may be generated by maintenance works e.g. avoid working in high wind, water dusty areas.
- Avoid "temporary" lighting within the rainforest for long periods. Lights will disturb animals that rest at night.

Protect cultural heritage

- Report any items/areas of cultural heritage (refer Appendix D) that are discovered to the DETSI (refer Appendix G). This is a legal requirement and will assist the DETSI to record the location.



Rehabilitate Disturbed Areas

Rehabilitation shall be undertaken in areas of disturbed ground that have been created by works (e.g. installation of a large structure; manual removal of weeds from a large area) or following landslides. When undertaking rehabilitation:

Seek advice

- Seek advice from your EO regarding the appropriate method of rehabilitation (refer Appendix G).

  Note: Different areas and situations require specific treatment and there are people who can provide specialist advice regarding the best approach (e.g. providing components of a hydromulch mix).

- Refer to Appendix B for surface stabilisation and revegetation guidelines. Rehabilitation can involve surface stabilisation against erosion and revegetation or surface stabilisation only.

Time works

- Undertake initial stabilisation of large disturbed areas (e.g. landslide; installation of a large structure) against erosion (e.g. mulching) immediately in the wet season and within 2 weeks in the dry season or when the climatic conditions are deemed suitable a TMR Environmental Officer.
- Permanently revegetate disturbed areas as soon as possible, following the initial stabilisation (refer Appendix B). Note: Sourcing appropriate species can take time - early planning is required to ensure hydromulching can commence within the above designated timeframes.

Manage topsoil

- Strip and stockpile topsoil prior to disturbing large areas where rehabilitation will be necessary (e.g. installation of a large culvert). Note: Stockpile should be within the 'footprint of disturbance' and away from water courses. If topsoil is to remain stockpiled for a period of time when it may rain, it should be protected (e.g. covered with weed free mulch or tarpaulin and bound by log/silt fence).
- Respread weed-free stockpiled topsoil over a scarified surface (e.g. scratched with grader teeth) on completion of works.

Select revegetation methods and species

- Seek specialist advice to ensure:
  1. The right species are chosen for the particular area and situation. Refer Appendix B for guidelines on species selection and Appendix G for specialist contacts.
  2. That revegetation will be successful. Note: some revegetation methods will work better than others in various situations. Refer Appendix B for revegetation methods available for roadside works in the WTWHA.

Maintain revegetated areas

- Protect revegetated areas from erosion by mulching or using geotextile blankets.
- Ensure on-going maintenance (i.e. fertilising and watering) of revegetated areas until plants are established.
- Maintain a vegetated ground cover between the works area and the adjacent watercourse or use erosion and sediment control techniques.



Maintain revegetated areas

Native animals use roadside vegetation (including logs and dead trees) as habitat and to cross roads.

Minimise clearing

- Consider clearing vegetation after the start of the wet season as many animals move at the beginning of the wet season.

  Note: It is acknowledged that TMR undertakes pre-wet season safety audits to ensure that all safety risks have been identified and rectified, which includes removal of broken tree limbs and loose rocks.

- Do not remove dead trees/branches and fallen logs if they are not a safety risk. These are often used by native animals.
- Talk to TMR Environmental Officer if you:
  1. believe you could create disturbance beyond the road formation (i.e. the outer edge of the table drain) (FIGURE 1).
  2. need to clear roadside vegetation (alive or dead) that obstructs visibility or is a safety threat (FIGURE 1, 3 and 4).
  3. need to undertake works on batters.
- Protect animal crossing and breeding areas.
- Avoid mowing if possible and encourage low growing native plants on roadsides.

Maintain canopy connectivity

In addition to assisting animals to cross roads, canopy connectivity can reduce "edge effects". Entry of light and noise disturbs native plants and animals and encourages ferals.

- Do not disturb existing canopy connectivity. Many tree dwelling mammals need canopy connectivity to cross roads. Trim vegetation in a manner that encourages canopy connectivity. (Refer 'Avoid Disturbance' Section above and FIGURES 4 and 5). Note: Canopy connectivity should particularly be encouraged over gullies and creeks as many animals move along them.
- Trim trees manually so they are 'trained' to grow above vertical 5.5m clear zones (FIGURES 4 and 5). Note: Training trees can reduce maintenance (e.g. 3-5 yearly as opposed to 6 monthly to annual attention).
- Do not remove canopy closure from around bridges if possible.
- Encourage canopy connectivity in all instances.
- Maintain existing clear zones in the shrub layer at known cassowary crossings. This can help drivers to see cassowaries in time to prevent collisions.
- Maintain fauna furniture (e.g. animal crossings, such as culverts and rope bridges).

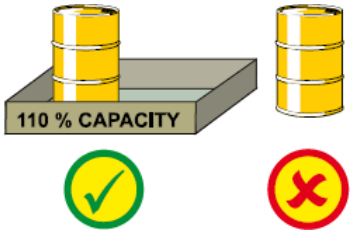
Prevent Contamination

Contain chemicals

Prevent contamination of waterways and land by containing fuels and other chemicals.

a. Store correctly

- Store chemicals outside of the WTWHA if possible.
- Ensure storage sites are a minimum of 1 OOm away from watercourses and within the road formation.
- Ensure all chemical containers (including fuel drums and paint tins) are in a watertight enclosure (e.g. bunded pallets and drip trays). The enclosure needs to be large enough to contain 110% capacity of the chemicals it is containing (e.g. a 100 litre drum should be contained within an enclosure able to hold 110 litres). This will prevent overflow during rainfall and conforms to the Australian Standard AS 1940.



b. Use correctly

- Use only non-residual herbicides, and those without surfactants (spreading agents) in the vicinity of watercourses. Residual herbicides persist in the soil and can be washed into watercourses
- Capture and remove all grease, oil, lubricants etc when maintaining or refuelling machinery within the WTWHA.

Clean up spills

- The Works Supervisor must report all spills in watercourses to **DETSI** (refer Appendix G).
- Ensure a fit-for-purpose spill kit is available on site.
  Note: Special spill kits and containment devices are available for spills into water. Ensure staff are trained in its use.
- In the event of spills to water:
  1. Identify the source (e.g. hole in bund) and block further spill.
  2. Prevent spill from spreading (e.g. oil spills can be contained within an enclosure as oil will not mix with water).
  3. Use spill kit to clean up.
  4. Scrape or soak up contained/treated spill (where appropriate).

5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
6. Seek advice if further treatment may be necessary.

In the event of spills to land:

1. Identify the source (e.g. hole in bund) and block further spill.
2. Prevent spill from spreading.
3. Use spill kit to clean up.
4. Dig out contaminated soil and replace with clean material, if necessary.
5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
6. Seek advice if further treatment may be necessary.

Manage Waste

Waste may be created by works or the public. Waste includes vegetation trimmings; chemical drums; food scraps; cans, tins and bottles; machinery parts; oil rags; tyres; flagging tape; etc.

- No soil or native vegetation (waste) can be removed from WTWHA without approval of WTMA.
- Mulch manageable sized vegetation trimmings (not weeds) and respread on the ground of adjacent vegetated areas. Do not disturb existing vegetation.
- Manage large logs by undertaking the following:
  1. Place logs in adjacent areas to provide animal habitat without disturbing existing vegetation. Hollow logs especially provide shelter and nesting sites for a large number of animals.
  2. Remove logs from areas where they may be a safety risk to motorists. These logs may be taken off-site to an approved disposal site if required.
  3. Remove logs from areas with steep slopes, where logs may roll and damage adjacent vegetation. These logs may be taken off-site if required.
- Do not bury or burn waste.
- Separate all waste that can be reused or recycled (e.g. glass, cans etc).
- Remove all waste, other than trimmings and logs, from the WTWHA to an appropriate site (e.g. Landfill). Seek advice from TMR Environmental Officer, if required. Transport waste in a covered skip or truck to an appropriate disposal facility.



Prevent Weed Spread

Roadsides are disturbed areas that allow weeds and pests to establish (e.g. feral rats can invade weedy grasses along roadsides). Weeds and pests compete with native species for habitat and food.

They can also change conditions so native areas along roads are no longer suitable for some native species (e.g. promote fires that cause change in vegetation types). TMR has a legal responsibility to manage weeds.

Identify weeds

- Look for weed problems during works such as: -

  Weeds never seen in an area before.

  Large increase of weeds in an area.

  Regrowth of weeds in a treated area.
- Report above problems to the Maintenance Supervisor who should discuss solutions with a TMR Environmental Officer. Note: Local governments, with assistance from DETSI, can manage weeds for TMR if problems are reported to them. Refer to Appendix C for problem weed species in the WTWHA.

Prevent weeds

- Wash down vehicles, to remove weeds and weed seeds and prevent spreading weeds to new areas, when:
  - vehicles or machinery are driven off the road formation (FIGURE 2).

    mowing and slashing equipment is moved to another work site.

  Note: Wash down is a thorough process of cleaning all areas of vehicles and machinery that may catch weeds and weed seeds (FIGURE 2). Washdown should occur in a dedicated area where runoff can be contained and weeds treated.

- Ensure that all materials imported onto the site are free of weeds and weed seeds. Ensure all purchased materials (e.g. topsoil; mulch) are certified as weed free using vendor declaration certificates.
- Apply herbicides in a 'spot spray or wick' manner to weed infested areas. 'Blanket' spraying along roadsides is not permitted in the WTWHA.
- Do not transport topsoil. Respread weed-free topsoil in the immediate vicinity of the area it was stripped from.

Treat weeds

When undertaking weed management observe the following:

- Use only non-residual herbicides and those without surfactants (spreading agents) in the vicinity of water courses. Residual herbicides may be used in table drains only if they are used in a spot spray manner. Note: Residual herbicides persist in the soil and can be washed into watercourses. Surfactants can lead to suffocation of amphibians.
- Undertake weed control (e.g. slash and spray) and

ensure:

Native vegetation is not also killed

Areas where weeds are removed are replanted with native plants (refer Appendix B). Note:

Regrowth of native plants can prevent weed regrowth.



Minimise Visual Impact

It is important to minimise negative impacts on the visual beauty of the WTWHA. Roads present the WTWHA to the community and tourists. Well maintained roads enhance the presentation values of the area.

- Consider the visual effect of roadside works. If you think works will have a major effect, discuss with your Supervisor.
- Paint over graffiti with a similar colour to the affected surface (e.g. rock faces, guard rail, etc) as soon as possible to discourage repeat acts of graffiti. Note: Graffiti decreases the natural beauty of an area. Communities expect governments to treat graffiti.
- Notify the relevant local government when abandoned vehicles are found. Local government is responsible for removal of these. Note: Abandoned vehicles lower the natural beauty of the WTWHA.
- Maintain road side stops and lookouts by:

  Mowing around seating and viewing areas

  Picking up litter

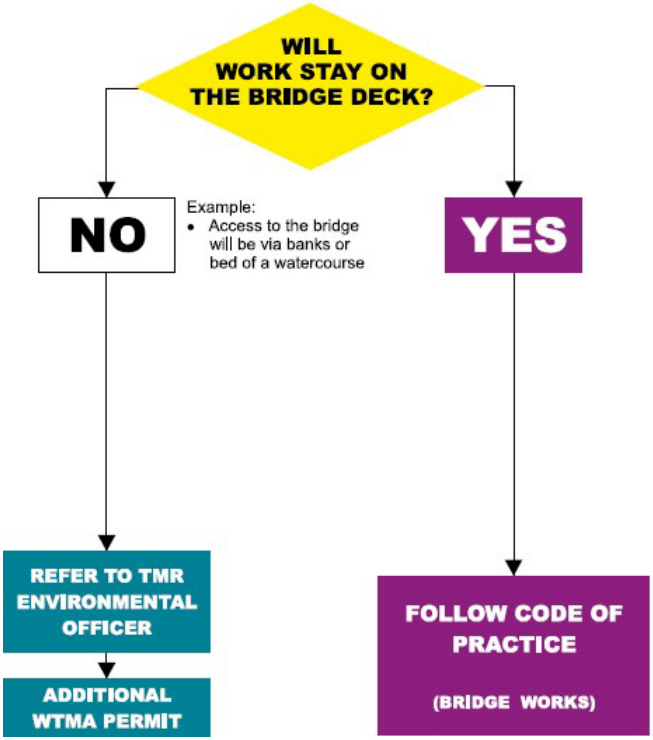
  Controlling weeds

  Note: Roadside stops and lookouts present the WTWHA to road users. If you observe that views have been obstructed by overgrown vegetation, please inform TMR Environmental Officer.

- Trim trees adjacent to roads in a way that encourages canopy connectivity (FIGURES 4 and 5).

  Note: Driving along a road where trees connect overhead is a pleasant experience for visitors to the WTWHA.

BRIDGE WORKS



What are Bridge Works?

"Bridge Works" are maintenance activities on any component of a bridge structure (FIGURE 9). Works that require disturbance to watercourse banks or beds (e.g. reinstating timber piles) are considered major works which will require advice from WTMA (refer Appendix G). Major works are not covered in this Code.

"Bridge Works" includes:

- Bridge servicing
- Cleaning out expansion joints and associated drains
- Timber preserving/waterproofing treatment
- Repairing/replacing kerbs
- Replacing deck planks
- Treating for termites
- Cleaning/repainting steel surfaces

Requirements



Avoid Disturbance

Minimise clearing

- Do not disturb watercourse beds or banks. Seek advice from a TMR Environmental Officer if you think works will require such disturbance (FIGURE 9).
- Trim vegetation at watercourses only when it is needed to access a bridge. Cut vegetation at watercourses in a way that allows resprouting (i.e. only remove the parts of branches that obstruct works).

Note: Vegetation along watercourses (riparian vegetation) has an important role in stabilising banks and often provides a safe movement path for animals.

Minimise noise, dust and light

- Minimise noise in the WTWHA (e.g. fit engine guards on machinery).
- Avoid "temporary" lighting within the rainforest for long periods. Lights can disturb animals.

Protect cultural heritage

- Report any items/areas of cultural heritage (refer Appendix D) that are discovered to DETSI (refer Appendix G). This is a legal requirement and will assist DETSI to record the location.

Maintain Animal Corridors and Habitat

- Give special consideration to known riparian fauna corridors.



Prevent Contamination

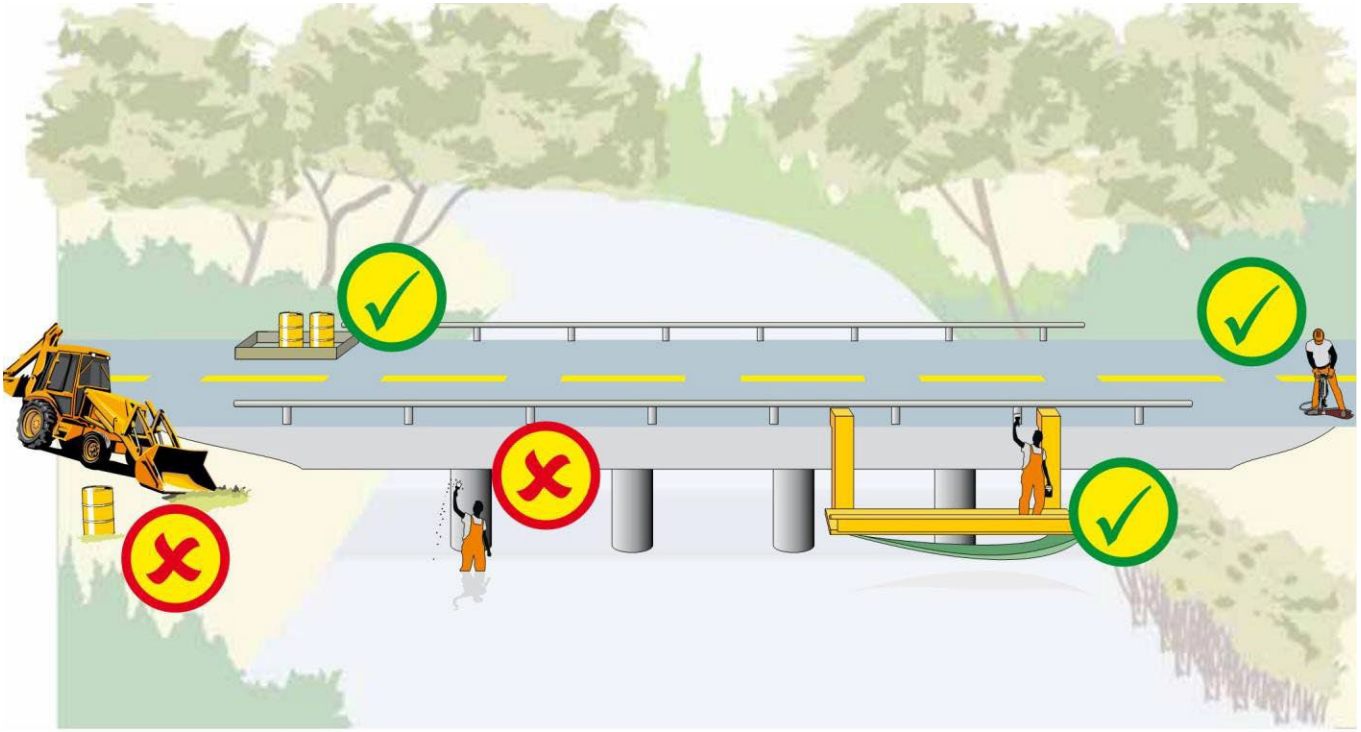
Contain chemicals

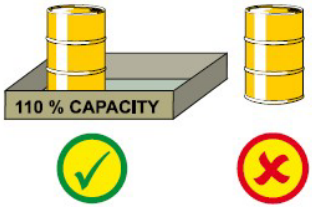
- Do not clean scuppers by hosing into waterways.
- Prevent contamination to waterways and land by containing fuels and other chemicals, by the following:

a. Store correctly

- Store chemicals outside of the WTWHA if possible.
- Keep storage sites outside the floodplain of the water course and away from the bridge and table drains. Locate storage sites within the road formation.
- Keep all chemical containers (including fuel drums and paint tins) in a watertight enclosure (e.g. bunded pallets and drip trays). The enclosure needs to be large enough to contain 110% capacity of the chemicals it is containing (e.g. a 100 litre drum should be contained within an enclosure able to hold 110 litres). This will prevent overflow during rainfall and conforms to the Australian Standard AS1940.

FIGURE 9



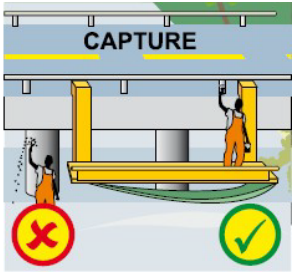


b. Use correctly

- Capture all removed surface coatings (e.g. scraped vinyl-based paints) in a watertight device (e.g. scaffold contained in canvas). This device should be in place prior to works commencing. Collect all captured waste material and remove from the WTWHA to an appropriate facility.

  Note: Lead based paint is highly toxic and is a regulated waste (under the *Environmental Protection Act 1994).* Works involving this will require strict workplace health and safety and environment procedures. Refer to TMR Environmental Officer.

- Capture all drips and spills, while applying surface treatments (e.g. paint; timber protection; etc), in a watertight device (e.g. scaffold contained in canvas). This device should be in place prior to works commencing.



- Capture and remove all grease, oil, lubricants etc when maintaining or refuelling machinery within the WTWHA.

Clean up spills

- The Works Supervisor must report all spills in watercourses to **DETSI** (refer Appendix G).
- Ensure a fit-for-purpose spill kit is available on site Note: Special spill kits and containment devices are available for spills into water. Ensure staff are trained in its use.
- In the event of spills to water:
  1. Identify the source (e.g. hole in bund) and block further spill.

2. Prevent spill from spreading (e.g. oil spills can be contained within an enclosure as oil will not mix with water).
3. Use spill kit to clean up.
4. Scrape or soak up contained/treated spill (where appropriate).
5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
6. Seek advice if further treatment may be necessary.

- In the event of spills to land:

1. Identify the source (e.g. hole in bund) and block further spill.
2. Prevent spill from spreading.
3. Use spill kit to clean up.
4. Dig out contaminated soil and replace with clean material, if necessary.
5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
6. Seek advice if further treatment may be necessary.

Manage Waste

Waste may be created by works or the public. Waste includes: chemical drums; food scraps; cans, tins and bottles; machinery parts; oil rags; tyres; flagging tape; etc.

- Separate all waste that can be reused or recycled (e.g. glass, cans etc).
- Collect debris (e.g. sweep up excess crumbled bitumen) and remove from site.
- Remove all waste from the WTWHA to an appropriate site (e.g. Landfill). Seek advice from TMR Environmental Officer, if required. Transport waste in a covered skip or truck to an appropriate disposal facility.



Prevent Weed Spread

TMR has a legal responsibility to manage weeds.

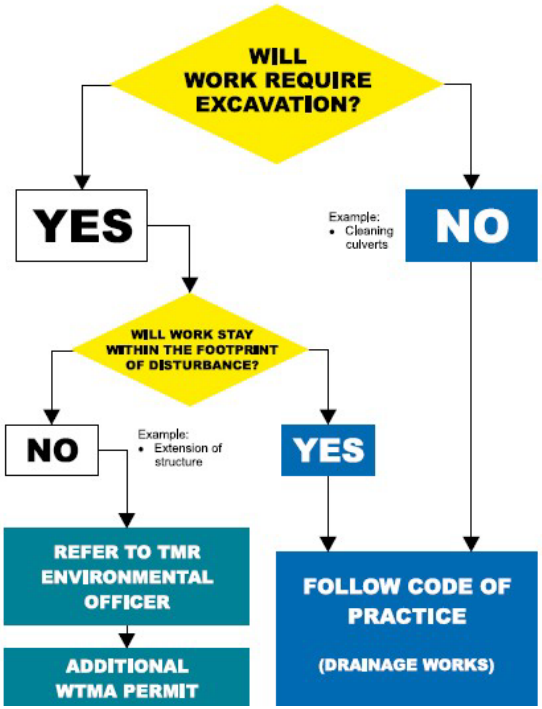
- Wash-down vehicles to remove weed seed/cuttings if vehicles leave the road formation or go through weedy areas (refer FIGURE 2). Wash-down must occur at a wash-down facility (not on site) prior to moving to another site.
- Refer to "Prevent Weed Spread" in the 'Roadside Works' section for methods of identification, prevention and treatment of weeds.



Identify Potential Problems

- Look for potential problems in the area during works such as new weeds not seen before, 'dieback' (refer Appendix E) and signs of erosion.
- Refer to 'Identify Potential Problems' in the 'Non-Surface Disturbance Works' section for more details about the sort of things to look for.

DRAINAGE WORKS



What are Drainage Works?

"Drainage Works" is repair and/or replacement of partsof the road drainage system, including culverts and floodways.

"Drainage Works" include:

- Installing/repairing/cleaning earth surface drains
- Installing/repairing/cleaning concrete surface drains
- Installing /repairing/cleaning culverts and pipes
- Repairing inlet/outlet scours
- Installing/inspecting/cleaning subsoil drains
- Cleaning floodways
- Installing/maintaining/removing Erosion and Sediment Control (ES&C) measures

Requirements



Avoid Disturbance

Minimise clearing

- **Talk to TMR Environmental Officer if you intend to create disturbance beyond the road formation (i.e. the outer edge of the table drain) (FIGURE 1)**.
- Locate stockpiles within the road formation (i.e. already disturbed area).

  Note: Placing stockpiles at the base of trees can kill them by preventing oxygen from reaching the tree roots.

Minimise noise, dust and light

- Minimise noise in the WTWHA (e.g. fit engine guards on machinery).
- Avoid "temporary" lighting within the rainforest for long periods. Lights can disturb animals.

Protect cultural heritage

- Report any items/areas of cultural heritage (refer Appendix D) that are discovered to **DETSI** (refer Appendix G). This is a legal requirement and will assist **DETSI** to record the location.

Manage Sediment in Drainage Structures

a. Clean Culverts and Pipes

- Clean culverts regularly.

  Note: Regular cleaning will not require the use of sediment trapping devices - refer below.

- Clean out low volumes of sediment (i.e. 1/3 height of culvert or less) with a hose (FIGURE 10).
- Clean out large volumes of sediment (i.e. greater than 1/3 height of culvert) as follows:
  1. Enclose area adjacent to outlet of culvert with a sediment trapping device (e.g. sandbags).
  2. Gently hose or sweep sediment from the culvert (i.e. do not erode area).
  3. Remove captured sediment (e.g. with shovel).
  4. Transport sediment out of WTWHA or to an approved stockpile site, in a covered truck.

     Note: Sediment may contain heavy metals washed from the road.

  5. Remove sediment trapping device prior to leaving site.

b. Clean Drains (FIGURE 11)

- Clean concrete drains as follows:
  1. Sweep with a broom and collect sediment.
  2. Inspect for signs of edge erosion (which may underpin the structure) and repair if present. Seek advice from a supervisor.
- Clean earth drains and ensure:

  - the profile of the drain is retained (to maintain capacity and avoid generating erosion & sediment - grading is restricted to outer edge of table drains.

c. Clean Sediment Retention Devices (FIGURE 11)

- Clean all sediment retention devices (e.g. sediment basins; rock check dams) regularly to ensure capacity is maintained.
- Transport sediment to an approved stockpile site, in a covered skip or truck.

  Note: Sediment may contain heavy metals washed from the road.

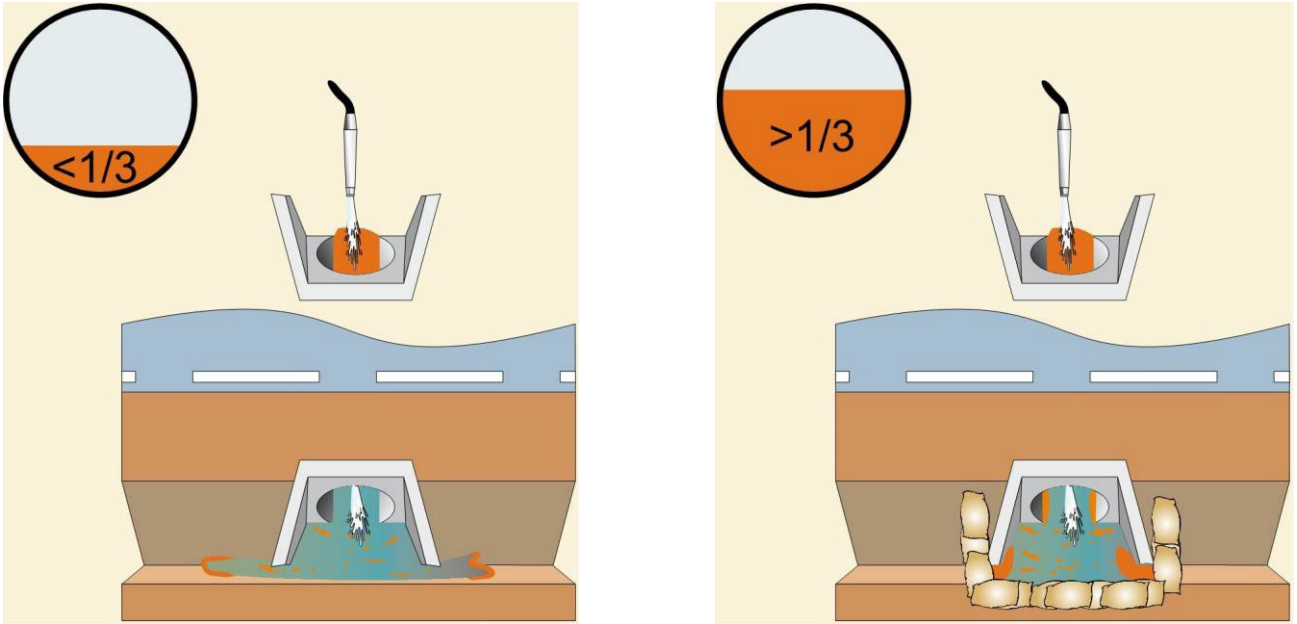
Manage Disturbed Soil

Disturbed soil, generated by drainage works, should be managed so it doesn't wash into watercourses. Sediment build-up in waterways can stop water from reaching habitats and can restrict or kill aquatic animals.

- Install/replace drainage structures (e.g. culverts; subsoil drains) (FIGURE 12), by following this procedure:
  1. Enclose area of works with a sediment trapping device (e.g. sandbags).
  2. Excavate required area (e.g. trench).
  3. Install structure (e.g. culvert).
  4. Provide protection at the outlets of drainage structures, particularly where these empty directly into watercourses. Seek advice from a TMR Environmental Officer on required outlet protection.
  5. Reuse excavated soil where possible (e.g. backfill trench).
  6. Remove excess soil (i.e. soil that cannot be compacted into disturbed work area) from WTWHA or transport to an approved stockpile site.
  7. Remove sediment trapping devices and tidy area prior to leaving site.
  8. Rehabilitate area if necessary. Refer "Rehabilitating Disturbed Areas" in Roadside Works chapter.

FIGURE 10

CLEAN CULVERTS



CONTAIN

FIGURE 11

MAINTENANCE OF EXISTING STRUCTURES

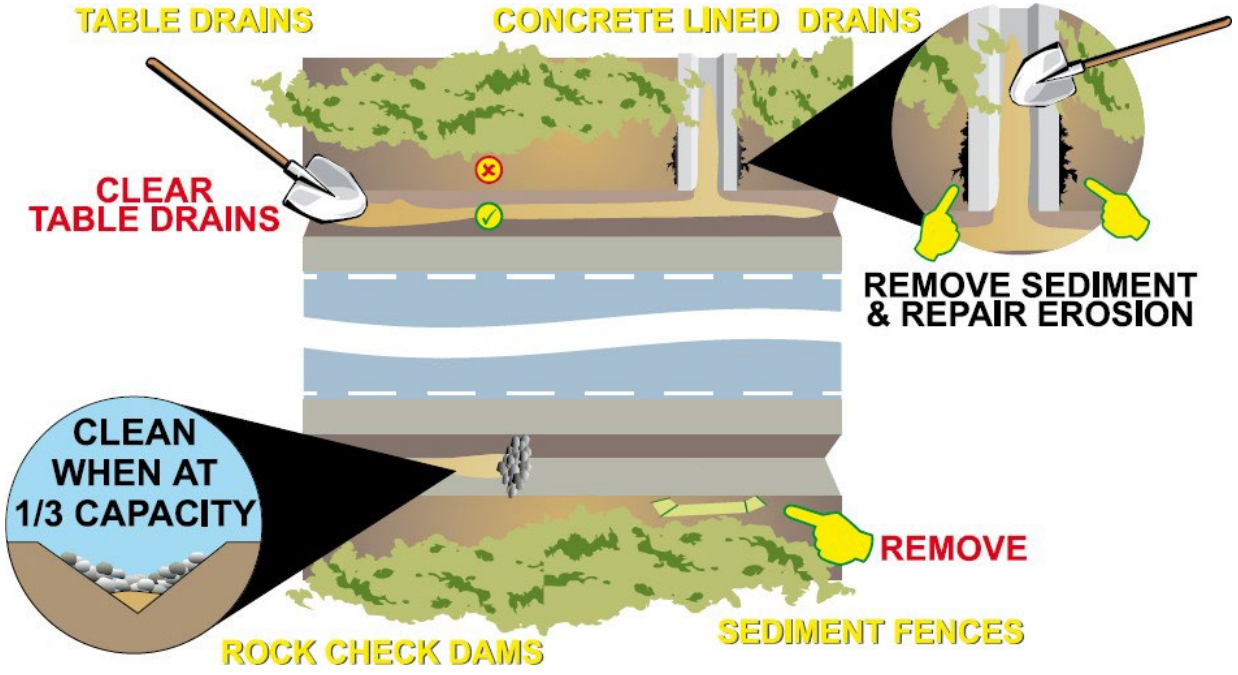
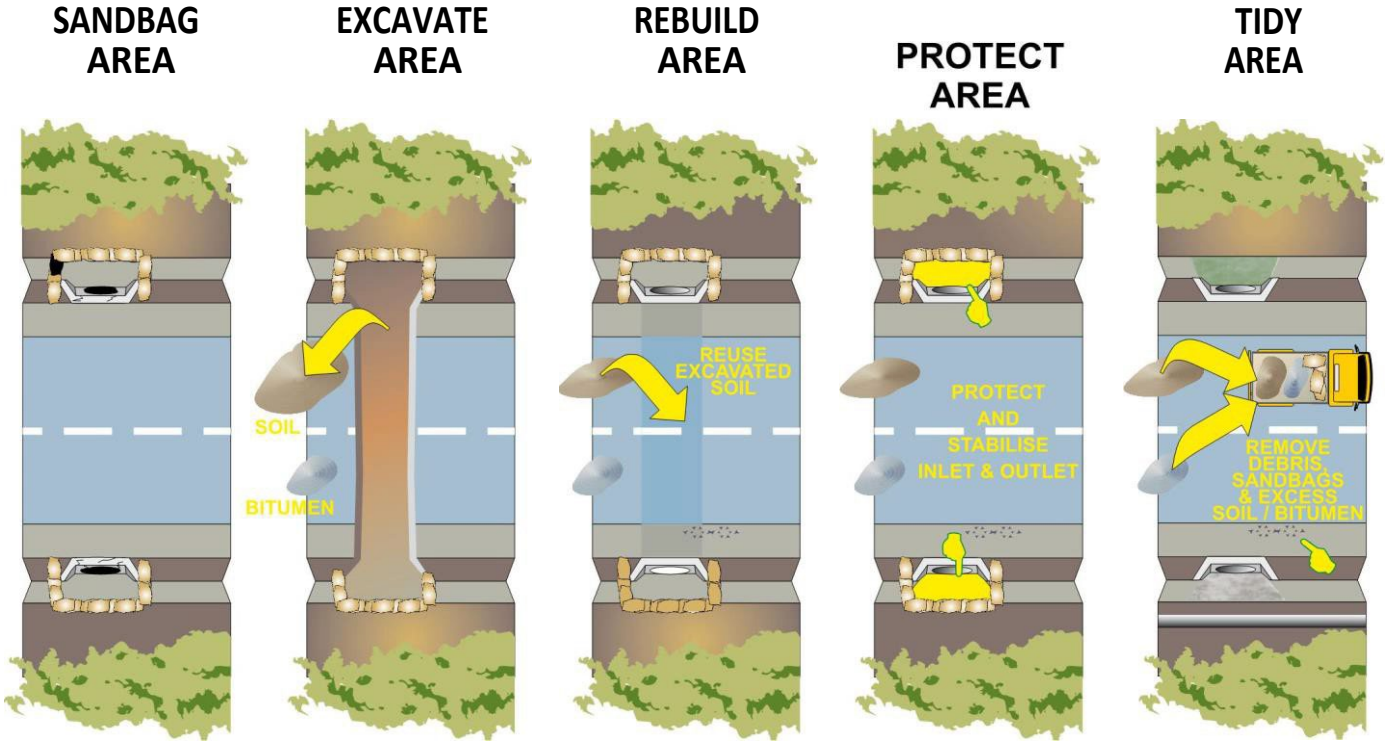


FIGURE 12

LARGE INSTALLATION e.g. CULVERT



Maintain Animal Corridors and Habitat

- Give special attention to significant areas (e.g. known habitat trees).
- Take care not to disturb vegetation surrounding culverts. Vegetated cover is often important to encourage animals to use culverts as safe passageways.

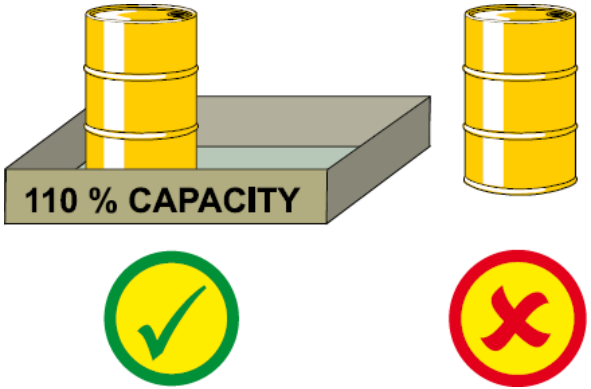
Prevent Contamination

Contain chemicals

- Prevent contamination to waterways and land by containing fuels and other chemicals, by the following:

a. Store correctly

- Store chemicals outside of the WTWHA if possible.
- Keep storage sites outside the floodplain of the water course and away from the bridge and table drains. Locate storage sites within the road formation.
- Keep all chemical containers (including fuel drums and paint tins) in a watertight enclosure (e.g. bunded pallets and drip trays). The enclosure needs to be large enough to contain 110% capacity of the chemicals it is containing (e.g. a 100 litre drum should be contained within an enclosure able to hold 110 litres). This will prevent overflow during rainfall and conforms to the Australian Standard AS1940.



7.

b. Use correctly

- Use only non-residual herbicides, and those without surfactants (spreading agents) in the vicinity of watercourses. Residual herbicides persist in the soil and can be washed into watercourses
- Apply all herbicides in a spot-spray manner (i.e. only spray in vicinity of weeds). Blanket spraying along roadsides is not permitted in the WTWHA.

Note: spot spraying of residual herbicides may be undertaken in table drains, however non-residuals are preferred.

8.



- Capture and remove all grease, oil, lubricants etc when maintaining or refuelling machinery within the WTWHA.

Clean up spills

- The Works Supervisor must report all spills in watercourses to DETSI (refer Appendix G).
- Ensure a fit-for-purpose spill kit is available on site.

Note: Special spill kits and containment devices are available for spills into water. Ensure staff are trained in its use.

- In the event of spills to water:
  1. Identify the source (e.g. hole in bund) and block further spill.
  2. Prevent spill from spreading (e.g. oil spills can be contained within an enclosure as oil will not mix with water).
  3. Use spill kit to clean up.
  4. Scrape or soak up contained/treated spill (where appropriate).
  5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
  6. Seek advice if further treatment may be necessary.
- In the event of spills to land:
  1. Identify the source (e.g. hole in bund) and block further spill.
  2. Prevent spill from spreading.
  3. Use spill kit to clean up.
  4. Dig out contaminated soil and replace with clean material, if necessary.
  5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
  6. Seek advice if further treatment may be necessary.

Manage Waste

Waste may be created by works or the public. Waste includes: vegetation trimmings; chemical drums; food scraps; cans, tins and bottles; machinery parts; oil rags; tyres; flagging tape; etc.

- Mulch manageable sized vegetation trimmings (not weeds) and respread on the ground of adjacent vegetated areas. Do not disturb existing vegetation.
- Manage large logs by undertaking the following:
  1. Place logs in adjacent areas to provide animal habitat without disturbing existing vegetation. Hollow logs especially provide shelter and nesting sites for a large number of animals.
  2. Remove logs from areas where they may be a safety risk to motorists. These logs may be taken off-site to an approved disposal site if required.
  3. Remove logs from areas with steep slopes, where logs may roll and damage adjacent vegetation. These logs may be taken off-site if required.
- Do not bury or burn waste.
- Separate all waste that can be reused or recycled (e.g. glass, cans etc).
- Collect debris (e.g. sweep up excess crumbled bitumen) and remove from site.
- Remove all waste, other than trimmings and logs, from the WTWHA to an appropriate site (e.g. landfill). Seek advice from TMR Environmental Officer, if required. Transport waste in a covered skip or truck to an appropriate disposal facility.



Prevent Weed Spread

TMR has a legal responsibility to manage weeds.

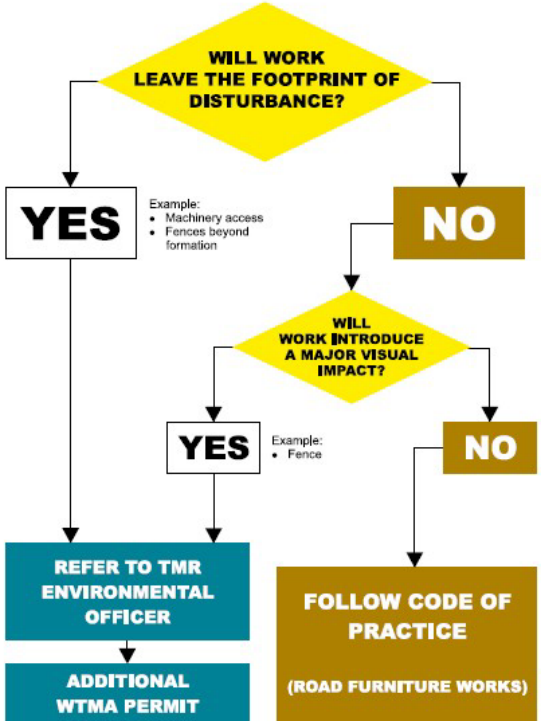
- Wash-down vehicles to remove weed seed/cuttings if vehicles leave the road formation or go through weedy areas (refer FIGURE 2). Wash-down must occur at a wash-down facility (not on site) prior to moving to another site.
- Refer to "Prevent Weed Spread" in the 'Roadside Works' section for methods of identification, prevention and treatment of weeds.



Identify Potential Problems

- Look for potential problems in the area during works such as new weeds not seen before, 'dieback' (refer Appendix E) and signs of erosion.
- Refer to 'Identify Potential Problems' in the 'NonSurface Disturbance Works' section for more details about the sort of things to look for.

ROAD FURNITURE WORKS



What are Road Furniture Works?

"Road Furniture Works" is repair and/or replacement of road furniture items along the roadside. Road furniture of a large size and/or that is quite different to the existing roadside may have a major visual impact. If you think a new structure might be in this category, WTMA should be contacted (refer Appendix G).

"Road Furniture Works" includes:

- Installing/repairing road signs.
- Installing/repairing/replacing guardrail.
- Repairing wire rope barriers.
- Repairing/replacing guide markers.
- Cleaning/painting guide markers.
- Cleaning/painting guard rail.
- Installing fences.

Requirements



Avoid Disturbance

Minimise clearing

- **Talk to TMR Environmental Officer if you intend to create disturbance beyond the road formation (i.e. *beyond* the outer edge of the table drain) (FIGURE 1).**
- Locate stockpiles within the road formation (i.e. already disturbed area).

  Note: Placing stockpiles at the base of trees can kill them by preventing oxygen from reaching the tree roots.

Minimise noise, dust and light

- Minimise noise in the WTWHA (e.g. fit engine guards on machinery).
- Avoid "temporary" lighting within the rainforest for long periods. Lights can disturb animals.

Protect cultural heritage

- Report any items/areas of cultural heritage (refer Appendix D) that are discovered to **DETSI** (refer Appendix G). This is a legal requirement and will assist **DETSI** to record the location.

Manage Disturbed Soil

Disturbed soil generated by road furniture installations must be managed so it doesn't wash into watercourses and harm aquatic animals or plants.

a. Large Installations (e.g. fence/culvert)- FIGURE 12 When installing large items of road furniture that will create large areas of disturbed ground, follow this procedure:

1. Enclose area of works with a sediment trapping device (e.g. sandbags).
2. Excavate required area (e.g. trench).
3. Install structure (e.g. culvert).
4. Reuse excavated soil where possible (e.g. backfill trench).
5. Remove excess soil (i.e. soil that cannot be compacted into disturbed work area) from WTWHA or transport to an approved stockpile site.
6. Remove sediment trapping devices and tidy area prior to leaving site.
7. Rehabilitate area if necessary. Refer "Rehabilitating Disturbed Areas" in Roadside Works chapter.

b. Small Installations (e.g. guide posts; guard rails) - FIGURE 13

When installing small items of road furniture that will only create small areas of disturbed ground, follow this procedure:

1. Excavate where necessary (e.g. post holes).
2. Install structure (e.g. posts)
3. Reuse excavated soil where possible (e.g. Push around post).
4. Compact all loose soil (e.g. with shovel).
5. Tidy area prior to leaving site.



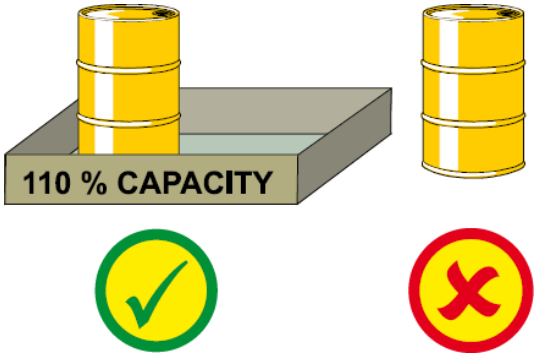
Prevent Contamination

Contain chemicals

- Prevent contamination to waterways and land by containing fuels and other chemicals, by the following:

a. Store correctly

- Store chemicals outside of the WTWHA if possible.
- Keep storage sites outside the floodplain of the water course and away from the bridge and table drains. Locate storage sites within the road formation.
- Keep all chemical containers (including fuel drums and paint tins) in a watertight enclosure (e.g. bunded pallets and drip trays). The enclosure needs to be large enough to contain 110% capacity of the chemicals it is containing (e.g. a 100 litre drum should be contained within an enclosure able to hold 110 litres). This will prevent overflow during rainfall and conforms to the Australian Standard AS1940.

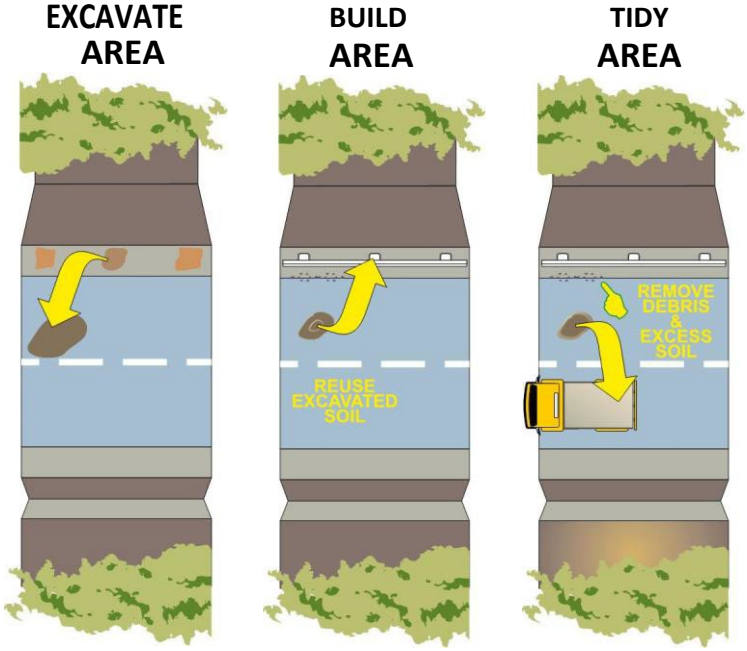


b. Use correctly

- Capture and remove all grease, oil, lubricants etc when maintaining or refuelling machinery within the WTWHA.

FIGURE 13

SMALL INSTALLATION e.g. GUARD RAIL



Clean up spills

- The Works Supervisor must report all spills in watercourses to DETSI (refer Appendix G).
- Ensure a fit-for-purpose spill kit is available on site.
  Note: Special spill kits and containment devices are available for spills into water. Ensure staff are trained in its use.
- In the event of spills to water:
  1. Identify the source (e.g. hole in bund) and block further spill.
  2. Prevent spill from spreading (e.g. oil spills can be contained within an enclosure as oil will not mix with water).
  3. Use spill kit to clean up.
  4. Scrape or soak up contained/treated spill (where appropriate).
  5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
  6. Seek advice if further treatment may be necessary.
- In the event of spills to land:
  1. Identify the source (e.g. hole in bund) and block further spill.
  2. Prevent spill from spreading.
  3. Use spill kit to clean up.
  4. Dig out contaminated soil and replace with clean material, if necessary.
  5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
  6. Seek advice if further treatment may be necessary.

Manage Waste

Waste may be created by works or the public. Waste includes: chemical drums; food scraps; cans, tins and bottles; machinery parts; oil rags; tyres; flagging tape; etc.

- Do not bury or burn waste.
- Separate all waste that can be reused or recycled (e.g. glass, cans etc).
- Collect debris (e.g. sweep up excess crumbled bitumen) and remove from site.
- Remove all waste from the WTWHA to an appropriate site (e.g. Landfill). Seek advice from TMR Environmental Officer, if required.
- Transport waste in a covered skip or truck to an appropriate disposal facility.



Prevent Weed Spread

TMR has a legal responsibility to manage weeds.

- Wash-down vehicles to remove weed seed/cuttings if vehicles leave the road formation or go through weedy areas (refer FIGURE 2). Wash-down must occur at a wash-down facility (not on site) prior to moving to another site.
- Refer to "Prevent Weed Spread" in the 'Roadside Works' section for methods of identification, prevention and treatment of weeds.



Minimise Visual Impacts

It is important to minimise negative impacts on the visual beauty of the WTWHA. Roads present the WTWHA to the community and tourists. Well maintained roads enhance the presentation values of the area.

Consider visual impacts of new features

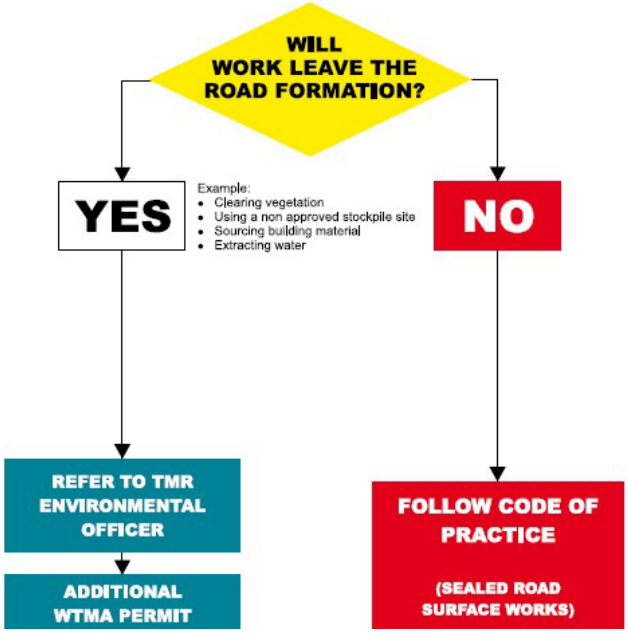
- Contact a TMR Environmental Officer if you are concerned that new road furniture will have a large visual impact. The Environmental Officer will seek advice from WTMA.
- Avoid paint splatter and drips as these look untidy.



Identify Potential Problems

- Look for potential problems in the area during works such as new weeds not seen before, 'dieback' (refer Appendix E) and signs of erosion.
- Refer to 'Identify Potential Problems' in the 'Non-Surface Disturbance Works' section for more details about the sort of things to look for.

SEALED ROAD SURFACE WORKS



What are Sealed Road Surface Works?

"Sealed Road Surface Works" are any activities that maintain pavements.

"Sealed Road Surface Works" include:

- Pavement edge repair
- Surface correcting
- Pothole patching
- Resealing
- Crack treatment with emulsion/aggregate
- Profile planing
- Scarifying
- Asphalt overlaying
- Surface sweeping
- Surface debris removal
- Line marking

Requirements

Avoid Disturbance

Minimise clearing

- **Talk to TMR Environmental Officer if you intend to create disturbance beyond the road formation (i.e. the outer edge of the table drain) (FIGURE 1)**.
- Locate stockpiles within the road formation (i.e. already disturbed area).

  Note: Placing stockpiles at the base of trees can kill them by preventing oxygen from reaching the tree roots.

- Restrict parking of vehicles and machinery to the road formation.

Minimise noise, dust and light

- Minimise noise in the WTWHA (e.g. fit engine guards on machinery).
- Avoid "temporary" lighting within the rainforest for long periods. Lights can disturb animals.

Protect cultural heritage

- Report any items/areas of cultural heritage (refer Appendix D) that are discovered to **DETSI** (refer Appendix G). This is a legal requirement and will assist **DETSI** to record the location.

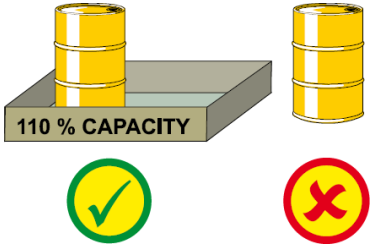
Prevent Contamination

Contain chemicals

- Prevent contamination to waterways and land by containing fuels and other chemicals, by the following:

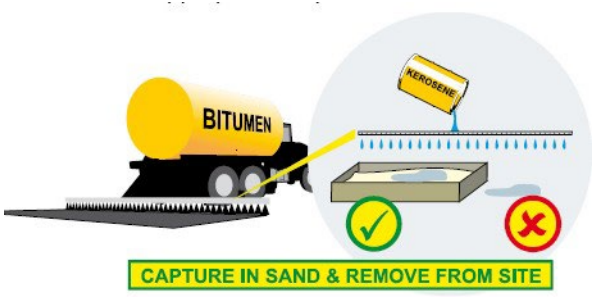
a. Store correctly

- Store chemicals outside of the WTWHA if possible.
- Keep storage sites outside the floodplain of the water course and away from the bridge and table drains. Locate storage sites within the road formation.
- Keep all chemical containers (including fuel drums and paint tins) in a watertight enclosure (e.g. bunded pallets and drip trays). The enclosure needs to be large enough to contain 110% capacity of the chemicals it is containing (e.g. a 100 litre drum should be contained within an enclosure able to hold 110 litres). This will prevent overflow during rainfall and conforms to the Australian Standard AS1940.



b. Use correctly

- Capture and remove all grease, oil, lubricants etc when maintaining or refuelling machinery within the WTWHA.
- Capture waste product with a sand filled container when cleaning bitumen spray bars. Dispose waste product outside of the WTWHA in an appropriate manner. Seek advice from TMR Environmental Officer for appropriate10. disposal.



- Do not spray bitumen if rain is forecast 24 hours before or after the proposed date of spraying.

Note: If rain occurs during or soon after spraying, there is a high potential for hydrocarbons to be washed into creeks. This is hazardous for frogs and other aquatic animals.

Clean up spills

- The Works Supervisor must report all spills in watercourses to DETSI (refer Appendix G).
- Ensure a fit-for-purpose spill kit is available on site.

Note: Special spill kits and containment devices are available for spills into water. Ensure staff are trained in its use.

In the event of spills to water:

1. Identify the source (e.g. hole in bund) and block further spill.
2. Prevent spill from spreading (e.g. oil spills can be contained within an enclosure as oil will not mix with water).
3. Use spill kit to clean up.
4. Scrape or soak up contained/treated spill (where appropriate).
5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
6. Seek advice if further treatment may be necessary.

In the event of spills to land:

1. Identify the source (e.g. hole in bund) and block further spill.

2. Prevent spill from spreading.
3. Use spill kit to clean up.
4. Dig out contaminated soil and replace with clean material, if necessary.
5. Seek advice from DETSI about correct waste disposal (refer Appendix G).
6. Seek advice if further treatment may be necessary.

Manage Waste

Waste may be created by works or the public. Waste includes: chemical drums; food scraps; cans, tins and bottles; machinery parts; oil rags; tyres; flagging tape; etc.

- Do not bury or burn waste.
- Separate all waste that can be reused or recycled (e.g. glass, cans etc).
- Collect debris (e.g. sweep up excess crumbled bitumen) and remove from site.
- Remove all waste from the WTWHA to an appropriate site (e.g. Landfill). Seek advice from TMR Environmental Officer, if required.
- Transport waste in a covered skip or truck to an appropriate disposal facility.





Prevent Weed Spread

TMR has a legal responsibility to manage weeds.

- Wash-down vehicles to remove weed seed/cuttings if vehicles leave the road formation or go through weedy areas (refer FIGURE 2). Wash-down must occur at a wash-down facility (not on site) prior to moving to another site.
- Refer to "Prevent Weed Spread" in the 'Roadside Works' section for methods of identification, prevention and treatment of weeds.



Identify Potential Problems

- Look for potential problems in the area during works such as new weeds not seen before, 'dieback' (refer Appendix E) and signs of erosion.
- Refer to 'Identify Potential Problems' in the 'NonSurface Disturbance Works' section for more details about the sort of things to look for.

NON-SURFACE DISTURBANCE WORKS

FOLLOW CODE OF PRACTICE

(NON-SURFACE DISTURBANCE WORKS)

What are Non-surface Disturbance Works?

"Non-surface Disturbance Works" are maintenance activities that do not physically add to or remove from the road formation or roadside. These activities generally involve observing or inspecting. Observation and inspection activities do not require special care in the WTWHA if vehicles do not leave the road formation.

"Non-surface Disturbance Works" include:

- Inspections for safety clearance zones.
- Bridge and/or road surface inspections.
- Drainage structure inspections.
- Environmental Management Plan auditing.

Requirements



Prevent Weed Spread

TMR has a legal responsibility to manage weeds.

- Wash-down vehicles to remove weed seed/cuttings if vehicles leave the road formation or go through weedy areas (refer FIGURE 2). Wash-down must occur at a wash-down facility (not on site) prior to moving to another site.
- Refer to "Prevent Weed Spread" in the 'Roadside Works' section for methods of identification, prevention and treatment of weeds.



Identify Potential Problems

Maintenance workers can help manage the WTWHA by identifying potential problems or solutions during their works.

Identify environmental issues relating to roads

a. Identify erosion and sediment build-up

- Look for signs of instability, erosion or sediment buildup. Examples of things to look for are:

  likely landslip areas

  sediment build-up in culverts and drains

  erosion adjacent to concrete lined drains

  erosion at outlet of culverts.

- Report these potential problems to the Maintenance Supervisor who should discuss solutions with a TMR Environmental Officer.

Note: Early detection can prevent costly problems developing.

b. Identify weeds

- Look for weed problems such as:

  Types of weeds never seen in an area before. Large increase of weeds in an area. Regrowth of weeds in a treated area.

- Report these problems to the Maintenance Supervisor who should discuss solutions with a TMR Environmental Officer.

Note: Local governments, with assistance from NR&M, can manage weeds for TMR if problems are reported to them. Refer to Appendix C for problem weed species in the WTWHA.

c. Report important fauna sightings

- Report sightings of animals crossing roads or animals that have been killed on roads to TMR Environmental Officer and researchers (refer to Appendix G).

- This can help identify:
  - hotspots for road kills
  - possible sites for fauna overpasses and underpasses.

Notify other government departments about issues relevant to them

a. Dieback

Dieback causes death of plants. There are many causes of Dieback. A known cause of Dieback in the WTWHA is the fungus *Phytophthora cinnamomi* which attacks the roots of plants and stops them from getting water. Refer to Appendix E**.**

- Report suspected Dieback signs to **DETSI** (Parks and Wildlife) so that the Dieback may be mapped and managed (refer to Appendix G).

b. Weeds

- Report weed problems (as described above) to **DETSI** (refer to Appendix G) so maps and management plans can be updated.

c. Cultural Heritage

- Report any items/areas of cultural heritage (refer to Appendix D) that are discovered to **DETSI** (refer to Appendix G). This is a legal requirement and will assist **DETSI** to record the location. **d.**

Abandoned Vehicles

- Report abandoned vehicles to the relevant local government (refer to Appendix G) so that they can remove vehicles.

Note: Abandoned vehicles can obstruct traffic and impact the natural beauty of the WTWHA.

APPENDIX A

International and Commonwealth Law

In 1974 Australia adopted the United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Convention. This Convention is a recognition of the need to identify and permanently protect the world's special areas.

Australia's commitment is recorded in the:

(a) *World Heritage Properties Conservation Act 1983* (Commonwealth);

(b) *Wet Tropics of Queensland World Heritage Area Conservation Act 1994* (Commonwealth);

(c) *Environment Protection and Biodiversity Conservation Act 1999.*

Queensland State Law

The *Wet Tropics Management Plan 1998* was established by the *Wet Tropics World Heritage Protection and Management Act 1993 (Qld).*

Under this Plan, permits are required to maintain roads and clear vegetation along roadsides within the WTWHA.

These permits are issued by the **Wet Tropics Management Authority (WTMA)**. This Authority was established to manage the WTWHA by the *Wet Tropics World Heritage Protection and Management Act 1993.*

Transport and Main Roads permit from the WTMA

Transport and Main Roads is required to comply with a permit issued by the WTMA when maintaining roads and clearing vegetation in the WTWHA.

A permit is required because the *Wet Tropics Management Plan 1998* provides that:

- **A person must not maintain a road within the Wet Tropics World Heritage Area unless it is lawfully carried out under a permit. [Section 26(1)(g)]**
- **A permit may be issued to a person to clear vegetation around a road to the extent necessary for its appropriate use. [Section 33(e)]**

Why we do we need a Code of Practice?

The Wet Tropics Management Plan 1998 states that a condition of a permit , to carry out and activity (such as road maintenance), mat be that the appicant (in this case, Tranport and Main Roads) must comply with a code of practice for the activity. WTMA requires that TMR prepare and follow a Code of Practice for road maintenance activities and in the clearing of roadside vegetation, in the WTWHA.

The Road Maintenance Code of Practice applies only to works within the 'footprint of disturbance' (FIGURE 1 at front of Code).

WTMA wants works to stay within the 'footprint of disturbance' because:

1) Section 65(2) of the Wet Tropics Management Plan 1998 stated that the Authority (WTMA) may issue a permit only if the roadworks under the permit would not have a net adverse impact on the integrity of the area or there is no prudent and feasible alternative.
2) Section 65(4) requires that, to the greatest possible extent, roadworks be confined to land already cleared or otherwise degrated.
3) Section 65(3) says that the Authority may permit canopy clearing only if it is satisfied that:
   a) this is needed for public safety, provision of a community service, access to a residence or an activity the Authority considers necessary to properly manage the area under this plan; or
   b) this will reduce the impact on the area's integrity of other activities being carried out or likely to be carried out; or
   c) there is no prudent or feasible alternative to the canopy clearing for building the infrastructure or road.

What happens when works need to be outside the 'footprint of disturbance'?

When works fall outside of the 'footprint of disturbance' they are not covered by the Transport and Main Roads permit to maintain roads in the WTWHA and a new stand-alone permit may be required.

The following works are considered outside the the 'footprint of disturbance' and will require an additional permit from WTMA for each and every instance:

- **upgrading, extending or wideing of an existing road;**
- **activities requiring canopy clearing;**
- **clearing beyong the exisiting disturbed or cleared area.**

APPENDIX B: Guidelines for Rehabilitating Disturbed Areas

Methods of Stabilising Disturbed Ground

Disturbed surfaces should be stabilised to prevent erosion. The table below outlines some methods of stabilising disturbed ground for roadside works in the WTWHA.

Table 1. Some methods of stabilising disturbed ground for roadside works in the WTWHA.

Stabilisation Method	Pros	Cons	Applications	Things to consider
Brush Matting Placing native brush material (twigs, cuttings, leaf litter) carefully harvested from adjacent bushland over disturbed surface.	▪ Can provide a source of local native seed for natural revegetation if material with seeds is included ▪ Encourages plant growth by retaining moisture, regulating soil temperatures & encouraging soil microorganisms. ▪ Low cost ▪ Can be done manually	▪ Natural revegetation can be less successful in rainforest ▪ Can blow/slide off exposed or steep areas ▪ Labour intensive	Less steep, accessible areas	▪ Natural revegetation more successful in eucalypt forest or rainforest edges where many fast growing species (eg wattles) germinate from seeds stored on trees
Hand Mulching Straw, woodchips etc placed over disturbed surface.	▪ Encourages plant growth by retaining moisture, regulating soil temperatures & encouraging soil microorganisms ▪ Low cost for small areas ▪ Can be done manually ▪ Can suppress weeds if applied thickly	▪ Can blow/slide off exposed or steep areas ▪ Labour intensive	Less steep, accessible areas	▪ Mulch should be weed free ▪ Pine bark and can leach toxins
Hydromulching Mulch mixed with water and an organic binder sprayed from a hydromulching machine. (Approximately 200kg of organic matter per hectare.)	▪ Encourages plant growth by retaining moisture and regulating soil temperatures ▪ Seed can be included with the mulch ▪ Can reach steep or otherwise inaccessible areas ▪ Fast coverage of large areas	▪ Requires specialist machinery ▪ Can be expensive for small areas ▪ Water soluble glues not be as effective in wet areas	Inaccessible slopes and large disturbed areas	▪ Seek advice from TMR Environmental Officer on appropriate application rates ▪ Seek advice from TMR Environmental Officer on appropriate seed mixes (if included)
Bonded Fibre Matrix Similar to hydromulch with much higher levels of organic materials and stronger non-soluble binders. (Approximately 4000 – 10000kg of organic matter per hectare.)	▪ Sticks to steep slopes ▪ Seed can be included with the mulch. ▪ Can reach steep or otherwise inaccessible areas ▪ Fast coverage of large areas ▪ Binders will not fail in wet conditions.	▪ Requires specialist machinery. ▪ Can inhibit natural regrowth ▪ Visually unattractive	Steep, inaccessible slopes and large disturbed areas	▪ Seek advice on appropriate application rates ▪ Seek advice on appropriate seed mixes (if included)

Stabilisation Method	Pros	Cons	Applications	Things to consider
Erosion Control Blankets / Textiles Rolled blankets woven from organic or inorganic materials that are pegged onto the ground	▪ Seeds can be woven into mats, or plants can be planted in holes cut into the mats ▪ Some mats break down and allow natural vegetation to grow through. ▪ Can suppress weeds	▪ Inorganic textiles can prevent natural regrowth ▪ Commercial products can be expensive ▪ Labour intensive ▪ Nylon meshing is hazardous to wildlife	Small slopes and areas where weed suppression is important	▪ Seek advice on appropriate seed mixes or plants if included
Rock Mulch Small sized rock placed over a surface to prevent it from being eroded	▪ Can provide long term erosion protection if installed correctly ▪ Can prevent erosion in areas of concentrated water flows	▪ Can suppress natural regrowth. ▪ Can be expensive for large areas ▪ Can be unattractive ▪ Soil can erode from under rock	Small areas where water flow is concentrated eg culvert outlets.	▪ A smooth soil surface and often geotextile is necessary under the rock
Soil Nailing Coir logs staked in place with timber stakes across unstable slopes.	▪ Can bind soil layers together and provide surfaces for planing to prevent landslips ▪ No specialist equipment necessary	▪ Access can be difficult ▪ Labour intensive ▪ Can be expensive	Steep, unstable batters and in stabilising landslips	▪ Seek advice on the number and positioning of coir logs necessary for the site
Rock mattresses or Gabions Rock held in place by a wire basket.	▪ Can stabilise steep unstable slopes ▪ Can prevent erosion in areas of concentrated water flows	▪ Expensive ▪ Requires good machinery access ▪ Uncertain lifespan ▪ Rupture could require difficult and expensive repair	Steep, unstable batters & areas where water flow is concentrated eg culvert outlets	▪ Galvanised wire should be used ▪ Appearance can be improved by adding topsoil and seeds/plants (NB Plant species should not undermine the structure eg ferns could be planted in gabions but not large trees)
Dump rock Large sized rock placed at the base of unstable slopes	▪ Quick, relatively cheap method for stabilising the base of landslips where roads have slipped ▪ Does not block natural flow of water in gullies below landslides ▪ Revegetation is possible following topsoiling of rock	▪ Can damage existing vegetation and stream banks	Limited to stabilising base of landlips in emergency situations where other options are not available	▪ Topsoil and seed can be added to promote vegetation growth over the rock

Note: This table is a guide only. Seek advice about the best stabilisation measures for each site.

The surface protection measures outlined in this table can be applied with or without planting or seeding. Vegetation is usually the best long-term method of stabilising ground and some revegetation is preferred in most areas. Revegetation could be undertaken at a different time to initial stabilisation work. See tables below for revegetation guidelines.

If possible, topsoil that has been saved by stripping before works or recovered from landslips, should be spread under/over surface protection to assist natural revegetation. For large areas treatment of topsoil to remove weed seeds should be considered.

Revegetation Guidelines

1. Which Species?

- Seek expert advice as soon as possible regarding the best species for each situation. When selecting species consider:
  - Safety (e.g. frangible plants within clear zones; some short-lived pioneer species such as black wattle should not be planted close to roads.)
  - Purpose of revegetation and site conditions. Some plants are better suited to some situations than others e.g. plants that naturally colonise landslides may be good choices for stabilising landslips.
  - Level of maintenance (e.g. low growing natives do not require mowing or slashing).
  - Weed prevention. Do not use species that could become environmental weeds (Refer table 2 below). Many cover crops can become environmental weeds and are not encouraged. If cover crops are used these should be sterile hybrids.
- It is important that local plant types are planted in disturbed areas. Guidelines for species selection for different 'provenances' of the WTWHA are included in table 3 below. It is best practice to collect and grow plants from seeds or cuttings collected from the local area. This is because a plant of the right species from a nursery may not have the genetic make up adapted to that area. *Note: Sourcing plants from local seed/cuttings can take up to 12 months.*

Table 2. Plants used in revegetation which have become environmental weeds in the wet tropics.

Black Spear Grass *(Heteropogon contortus)*	Buffell Grass
Grader Grass *(Themeda quadrivalvis)*	Indian Couch

Table 3. Plants suitable for different 'provenances' of the WTWHA. *(List supplied by the Centre for Tropical Rehabilitation)*

LOWLAND RAINFOREST AREAS 0- 400m asl

Trees/Shrubs		**Low growing species.**	
Fig	*(Ficus congesta)*	Mattrush	*(Lomandra hystrix)*
Fig	*(Ficus septica)*	Native Ginger	*(Alpinia caerulea)*
Iron Malletwood	*(Rhodamnia sessiliflora)*		
Brown Laurel	*(Cryptocarya triplinervis)*		
Weeping Cleistanthus	*(Cleistanthus apodus)*		
Turn in the wind	*(Mallotus paniculatus)*		
Kamala	*(Mallotus mollissimus)*		

UPLAND RAINFOREST AREAS	**400-8OOm asl**		
Trees/Shrubs		**Low growing species.**	
Fig	(*Ficus congesta*)	Native Ginger	*(Alpinia caerulea)*
Fig	(*Ficus septica*)	Sword Grass	*(Gahnia sieberana)*
Ironwood	(*Rhodomyrtus pervagata*)		
Creek Satinash	(*Syzygium australe*)		
Lillipilli Satinash	(*Acmena smithii*)		
Brown Myrtle	(*Decaspermum humile*)		
Brown Laurel	*(Cryptocarya triplinervis)*		
Maesa	*(Maesa dependans)*		
Pink Myrtle	*(Archirhodomyrtus beckleri)*		
Pidgeon Berry	*(Wickstroemia indica)*		
Kamala	*(Mallotus mollissimus)*		
Red Kamala	*(Mallotus philippensis)*		

HIGHLAND RAINFOREST AREAS	**800m + asl**	**Low growing species.**	
Trees/Shrubs			
Turkey Bush	*(Rhodamnia sericea)*	Native Ginger	*(Alpinia caerulea)*
Fig	*(Ficus congesta)*		
Fig	*(Ficus septica)*		
Lillipilli Satinash	*(Acmena smithii)*		
Fig	*(Ficus copiosa)*		
Boombil	*(Ficus hispida)*		
Pink Myrtle	*(Archirhodomyrtus beckleri)*		

EUCALYPT FOREST AREAS			
Trees/Shrubs		**Low growing species**.	
Sim's Wattle	*(Acacia simsii) (Acacia flavescens)*	Kangaroo Grass	*(Themeda australis)*
Red Wattle		Sword Grass	*(Gahnia aspera)*
Brown Salwood	*(Acacia aulacocarpa var minor)*		
Ti-trees	*(Leptospermum* species)		

ALL AREAS			
Trees/Shrubs		**Low growing species.**	
Pandanas		Native Ferns	
Native Palms		October surprise vine	
Apricot Myrtle	*(Pilidiostigma tripicum)*		

2. Which Revegetation Method?

The table below outlines revegetation methods that might be used on disturbed areas likely to be encountered in road maintenance works.

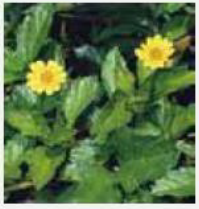
Table 4. Some revegetation methods available for roadside works in the WTWHA

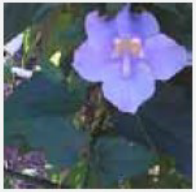
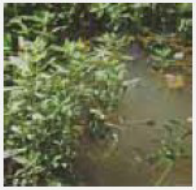
Plant stock	Planting method	Pros/Cons	Applications	Things to consider
Seed	**Hydroseeding** (seed mixed with water sprayed from a hydromulch machine)	• Can cover large and difficult to reach areas quickly but can be expensive and require special machinery • Seed easily washed away unless mulch and binder used • Except for wattles, success of seed establishment is unproven	• Areas where hydromulching is being used	• Seek advice on appropriate seed mix and seeding rates • Viability of seed mix – many seeds cannot be stored over long periods • Mulch should also be applied to control weeds and promote growth • Consider treating topsoil to kill weeds for larger areas • Maintenance – weed control may be necessary – watering may be necessary until established after germination
	Hand seeding (Spreading seeds by hand)	• Efficient and cheap for small accessible areas	• All accessible areas	
	Respread topsoil	• Can regenerate small areas with locally adapted species faster than other methods • Topsoil can contain weed seeds	• Small areas of disturbance • Should be considered in combination with other methods in most situations	
Plants	**Tube stock** (potted seedlings) 	• More expensive than seed but have a higher percent establishment • Often have better form and quickly overtake more advanced stock	• All accessible areas	• Seek advice on appropriate species and stock • Plants with a higher root to shoot ratio are best e.g. long vs short tubes • Mulch should also be applied • Maintenance – weed control may be necessary – watering may be necessary until established
	Advanced plants 	• Expensive, difficult to handle and require more maintenance than tube stock. • Immediate appearance of improvement	• Visible areas (e.g. Road side stops)	

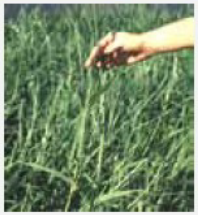
APPENDIX C: Serious Environmental Weeds in the WTWHA

Environmental Weeds = Weeds that compete with native plants and can cause serious damage to natural areas. These are of most concern to WTMA.
Declared Weeds = Weeds declared under the *Biosecurity Act 2014 (Queensland)* There is a legal requirement to control declared weeds.

Weed	Description		Why a problem?	Where found?	What to do if seen?
Siam Weed *(Chromolaena odorata)*		Grows as a dense scrambling bush with soft, hairy leaves and purple flowers.	Considered one of the world's worst weeds with the potential to rapidly spread across the north and east coast.	Small infestations recently recorded in the Tully-Mission Beach area.	Report the location of any plants seen to your EO. Your EO should immediately report this to DEHP who will advise of further action required. Strict washdown/material certification should be undertaken when working in, or receiving materials from, the Mission Beach/Tully area.
Mile-a-minute *(Mikania micrantha)*		Vine with heart-shaped leaves, greenish-white flowers grouped on long stems.	Considered one of the world's worst tropical weeds. Can smother native forests and could spread throughout the wet tropics.	Small infestation recently recorded in the Mission Beach Area.	Report the location of any plants seen to your EO. Your EO should immediately report this to DEHP who will advise of further action required. Strict washdown/material certification should be undertaken when working in, or receiving materials from, the Mission Beach/Tully area.

Weed	Description		Why a problem?	Where found?	What to do if seen?
Miconia *(Miconia calvescens)*		Tree with large distinctly veined leaves, dark green above and purple underneath.	Spreads rapidly shading out native forests and pastures and increases erosion by killing ground cover plants.	Major weed in Pacific Island rainforests (has destroyed 70% of Tahiti's native forests) and could have a major impact on the Wet Tropics.	Report the location of any plants seen to your EO. Your EO should immediately report this to DEHP who will advise of further action required.
Pond Apple *(Annona glabra)*		Small tree with soft grey stems containing obvious small air holes. Leaves turn yellow and fall in the dry. Large green custard apple-like fruit.	Dense Pond Apple stands can invade and completely replace paperbark and mangrove wetland and streamside forests.	Now spreading through areas between Ingham and Cooktown.	Report the location of any plants seen to your EO. Your EO should report the location to DEHP and the area's local government pest management officer.
Singapore Daisy ***(Sphagneticola trilobata)***		Creeper with fleshy, shiny dark green leaves with irregular tooths and bright yellow 'daisy' flowers.	Rapidly spreads forming a thick ground cover that prevents regeneration of native plants.	Has been used in landscaping and is found along roadsides throughout the Wet Tropics.	Report the location of any plants seen to your EO. Your EO should report the location to DEHP and the area's local government pest management officer.

Weed	Description		Why a problem?	Where found?	What to do if seen?
Laurel Vines/ Blue Trumpet *(Thungbergia species)*		Vigourous vine with large 'choko-like' lobed leaves and a large distinctive 'trumpet-like' blue/purple /yellow flower.	Major threat to remnant vegetation in the Wet Tropics. Can quickly smother vegetation and pull down mature trees.	Scattered distributions along coastal streams from Tully to the Daintree. Some species which are serious weeds in other countries have not been recorded in Australia yet and should be prevented from establishing.	Report the location of any plants seen to your EO. Your EO should report the location to DEHP and the area's local government pest management officer.
Alligator Weed (*Alternanthera philoxeroides*)		Small plant with dark green leaves with a distinct middle vein and white paper-like ball-shaped flowers. Can form dense mats in water.	Can block waterways and smother wetlands.	Grows along waterways and damp ground. Found in a small number of places in Queensland but has potential to spread though out coastal areas.	Report the location of any plants seen to your EO. Your EO should report the location to DEHP and the area's local government pest management officer.

Weed	Description		Why a problem?	Where found?	What to do if seen?
Hymenachne (*Hymenachne amplexicaulis*)		Stolon grass up to 2.5m high with large leaf blades that clasp the stem at their base.	Can totally modify tropical wetlands.	Introduced as a ponded pasture. Has invaded 1,000ha of land in the Wet Tropics.	Report the location of any plants seen to your EO. Your EO should report the location to DEHP and the area's local government pest management officer.
Para Grass (*Brachiaria mutica*)		Large trailing grass that spreads with large stolons extending out up to 5m. Hairy shiny thin leaves. Purplish flowers grouped densely along inflorescence branches at the end of each grass stem.	Destroys waterbird breeding habitats and chokes tropical streams; replaces native vegetation	Wetlands and streams in the wet-dry and wet tropics and sub tropics	Monitor the spread of areas of the grass over time. Report large increases in area or new areas of the grass to your EO. Your EO should report information on the spread of this grass along roadsides to DEHP and the area's local government pest management officer.
Guinea Grass (*Panicum Maximum*)		Tall upright grass (up to 3m) with fine hairless flowers in inflorescences at the end of stems. Long soft narrow leaves and rice like seeds.	Spreads quickly, smothering native plants. Can promote fire spread into fire sensitive areas such as riparian rainforests.	Widespread along roadsides in some areas of the WTWHA.	Monitor the spread of areas of the grass over time. Report large increases in area or new areas of the grass to your EO. Your EO should report information on the spread of this grass along roadsides to DEHP and the area's local government pest management officer.

Sources: This list was compiled from information obtained from WTMA, DEHP and the Centre for Tropical Freshwater Research.

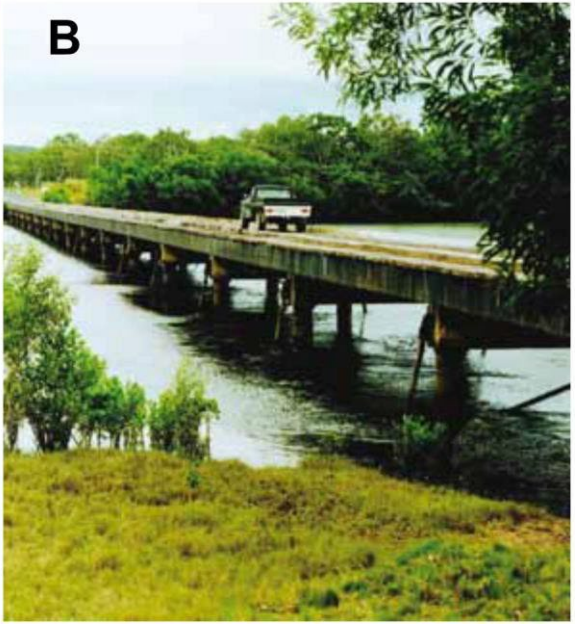
APPENDIX D: Cultural Heritage Examples

EXAMPLES OF HISTORIC CULTURAL HERITAGE:

- quarries and mine sites
- grave sites
- abandoned town sites
- old dwellings
- wells
- camp fires and hearths
- surveyor marks (see Photo A)
- roads and bridges (see Photo B)



Survey Markings, Birdsvile, SW QLD



Heritage Crossing, Annan River, Far North QLD

EXAMPLES OF PRE-HISTORIC CULTURAL HERITAGE:

- Rock art
  (See Photo C)
- scarred trees (i.e. bark removed to make things like canoes)
- carved trees (i.e. bark removed and heartwood carved)
- stone arrangements and circles
- axe grinding gooves
  (See Photo D)
  camp fires
  cemeteries
- middens (shellfish remains associated with stone artefacts)
- stone flake artefact scatters (See Photo E)







APPENDIX E: Dieback Identifiers



Dieback causes death of plants. There are many causes of Dieback. One known cause of Dieback in the WTWHA is the fungus *Phytophthora cinnamomi* which attacks the roots of plants and stops them from getting water.

Dieback occurs naturally in the bush. However it may be spread by human activities (e.g. along roads and walking tracks) and affect much larger areas than it would naturally. The presence of dieback must be confirmed by specialists. However, there are simple field indicators you can use to help determine if Dieback is present:

These indicators are:

- Small areas of trees that die suddenly (e.g. within 6-12 months).
- Unusual discolouration of leaves (commonly red/yellow).
- Obvious spread of death in trees (e.g. oldest death in the centre or on the uphill end of a group of sick trees).
- Obvious boundaries between healthy and sick vegetation (e.g. see photo).

If you think vegetation may be affected by Dieback, please contact DETSI (Parks and Wildlife) (refer Appendix G).



Late-onset symptoms of myrtle rust on beach cherry *(Eugenia reinwardtiana)* leaf

MYRTLE RUST FACTS

Myrtle rust is a serious fungal disease that affects plants in the Myrtaceae family, such as rose apple (lilly pilly), tea tree and bottle brush.

Myrtle rust cannot be eradicated and will continue to spread in Queensland because it produces large numbers of spores that are easily spread by wind, human activity and animals.

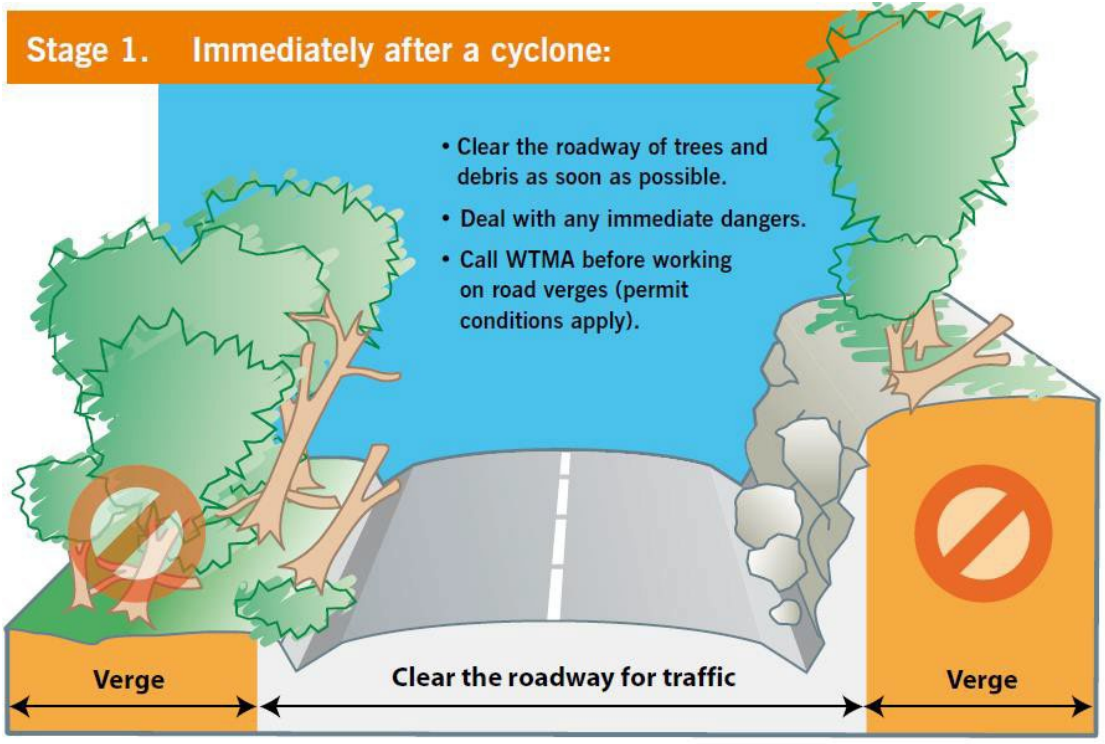
However, to determine how far it has spread and to learn more about the disease, Biosecurity Queensland needs to know if you think you have seen myrtle rust.

Call 13 25 23 or fill in the online form to report any suspected sightings

http://www.daff.qld.gov.au/4790_ 19791.htm

APPENDIX F: Keep the Trees




Stage 1. Immediately after a cyclone:
• Clear the roadway of trees and debris as soon as possible.
• Deal with any immediate dangers.
• Call WTMA before working on road verges (permit conditions apply).
Verge
Clear the roadway for traffic
Verge


Stage 2. The road to recovery
Ask WTMA BEFORE you begin work on roadside verges to:
• Remove or mulch any vegetation debris or windrows.
• Assess the risk of standing trees and remove dangerous trees.
• Undertake any earthworks.
• Revegetate the roadside verges and control weeds.
Verge
Verge



This booklet was produced by the Wet Tropics Management Authority to help protect roadside vegetation.

APPENDIX G: Helpful Contacts

What	Why	Who
ALL ENVIRONMENTAL QUERIES	• To discuss solutions for all environmental queries, including issues outlined below • To contact specialists on your behalf	Department of Transport and Main Roads Environmental Officers Northern and Far North Regions **Refer Transport and Main Roads Intranet Directory**
ANIMALS **(INJURED ANIMALS)**	To report: • Animals injured by motorists • Animals injured by works	Department of Environment, Tourism, Science and Innovation. Hot line **1300 264 625**
ANIMALS **(NATIVE ANIMAL CORRIDORS)**	To provide information to researchers on: • Common areas of road kill • Known fauna passage ways/culverts • Recommended sites for fauna underpasses or overpasses	Wet Tropics Management Authority **(07) 4241 0500**
CULTURAL HERITAGE **(REFER APPENDIX D)**	Discovery of cultural heritage items or areas (refer Appendix D).	Department of Environment, Tourism, Science and Innovation. **1300 130 372 (option 2)**.

What	Why	Who
MYRTLE RUST/DIEBACK **(REFER APPENDIX E)**	Observation of Dieback indicators (refer Appendix E)	Biosecurity Queensland **13 25 23**
DISPOSAL OF CONTAMINATED **SOIL AND OTHER WASTE**	Small chemical spills to land	Department of Environment, Tourism, Science and Innovation. Pollution Hotline **1300 130 372 (option 2)**
EMERGENCY SPILLS **(CHEMICAL AND OTHER)**	All chemical spills to watercourses Large chemical spills (i.e. greater than 1000 litres) to land	Department of Environment, Tourism, Science and Innovation. Pollution Hotline **1300 130 372 (option 2)**
LANDSLIP STABILISATION	Physical stabilisation of landslips	Department of Transport and Main Roads, Far North District **40457144**
REVEGETATION	Plant and seed species selection Plant and seed collection Community group assistance for planting	Wet Tropics Management Authority **(07) 4241 0500**

What	Why	Who
WEEDS	Observation of weeds: ● New types of weeds never seen in an area before ● Large increase of weeds in an area ● Regrowth of weeds in an area that has been treated	Biosecurity Queensland **13 25 23**
WORKS OUTSIDE THE SCOPE OF THIS CODE OF PRACTICE **(WORKS OUTSIDE THE 'FOOTPRINT OF DISTURBANCE')**	Large trees to be removed for safety material sourcing Water extraction Stockpile site approval Earthworks to improve motorist visibility Installation of a structure outside the 'footprint of disturbance' Introducing a major visual impact	Wet Tropics Management Authority (Environmental Officers) **07 4241 0500**
VEHICLES[1] **(ABANDONED VEHICLES)**	Vehicles abandoned on road formation Vehicles pushed off road formation	Local Government Authority **Refer Directory Assistance**

1. Abandoned vehicles can obstruct traffic and lower the natural beauty of the WTWHA. If sighted, local government should be notified so that they can remove vehicles.