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Preparing your land for wild weather

The Tauranga Harbour catchment enjoys high sunshine hours and reliable rainfall. Combine this with our rich soils and moderate temperatures and we have a great environment for growing plants and animals. However, occasional storms, mainly from the northeast bring warm fronts and lots of rain. These storms generally fall over a short period and the catchment's topography allows it to drain quickly away. The damage these storms create can be, at best, inconvenient, and at worst highly destructive.

Help is at hand

This toolkit is for anyone who owns a farm, orchard or land surrounding Tauranga Harbour. We hope you will find the information useful for preparing your land for wild weather. Please contact a Tauranga Land Management Officer for free advice.

Drainage maintenance: your first line of defence.

Drains

The purpose of a farm drain is to lower the water table to a level that provides optimum soil conditions for growing plants. They need regular cleaning in order to maintain an optimum water table and manage volume and flow during heavy rain fall. There are some negative effects of drain cleaning such as increased sediment disturbance, removal of habitat for native fish species and introducing toxins from herbicides.

PLAN FOR THESE

- Carry out regular inspections of drains. Clear obvious blockages, including those from the inlet and outlet of culverts.
- Clean out farm drains only as required to maintain the water table. Depending on the adjacent land use, a clean-out might only be required every five years.
- Consider doing 10-20m lengths at a time or only digging out one side at a time so that half the drain remains undisturbed.

MAKE USE OF THESE

- Leave spoil far enough from edge of drain so any native fish removed can re-enter the drain.
- Re-establish grass on exposed banks.
- Establish a buffer zone of at least 1m at the top of the drain and fence to exclude stock. This will help protect the drain from treading damage and filter sediment from overland flow.

AVOID THESE

- Excavation during peak fish spawning and migration and bird nesting periods (see a Land Management Officer for more information on these periods).
- Using herbicides, but if you do then do not spray herbicide across open water.



Photo: Near sea level, this drain struggles to cope with a high water table.

Streams

Streams are an important part of the drainage system on your property and should be inspected for potential drainage issues. Debris blockages or log jams can cause erosion as water flows around them. They may also create havoc for you and your downstream neighbour if they let go in large storm events.

PLAN FOR THESE

- Regular stream inspections to identify potential issues.
- Felling old trees that will otherwise collapse into the streambed. These should be felled away from the stream and may require expert operators in machine assisted felling techniques.
- Use appropriate plant species when establishing riparian vegetation.

MAKE USE OF THESE

- Land Management Officers who can provide advice and solutions for managing your stream.
- Bay of Plenty Regional Council funding support for riparian management.

AVOID THESE

- Carrying out any works with a machine in a stream without proper authority.
- Locating farm infrastructure within the riparian margin, including buildings and shelterbelts.



Streambank protection works

What does this mean?

It means protecting your riparian margin from erosion by water. The main reason you would consider this is to protect farm infrastructure and your investment in the land itself. The power of Mother Nature during a flood can be frightening. If you prepare in advance you stand a better chance of reducing the clean-up cost to your business. Farms at higher elevation do not often become inundated but may still experience streambank erosion during heavy rain.

Aside from any localised damage, a significant amount of soil can be lost downstream and into the harbour from streambank erosion. No one wants to see their expensive fences, water pumps, stream crossings, power cables, water supply and livestock ending up in our prized toanga – Tauranga Moana!

PLAN FOR THESE

- If you haven't already then gather as much information about how your stream reacts at different rain fall levels. If you are unsure, ask your neighbours where the flood levels have reached in the past.
- Use this reference to plan for productive use of this floodway. Keep expensive or vulnerable infrastructure, machinery or crops out of this zone.
- Choose a suitable fence type for excluding stock from the stream. A nine wire post and batten fence in low lying areas will often gather flood debris and collapse. A permanent electric fence will allow flood water to pass under or through and if required the cost of replacement or repair will be less.
- Check your stream regularly for built up material, such as log jams, gravel or rubbish that may redirect stream flows and cause erosion.
- Create a buffer zone around your stream and allow grasses and occasional woody vegetation, preferably native species, to grow. The ground cover and root systems they provide will help bind the soil.
- Removing older soil conservation trees such as crack willow and replacing with modern hybrids.



Photo: Constructing rock structure to protect farm bridge access.

MAKE USE OF THESE

- Check your local weather forecast for heavy rainfall events.
- Use Bay of Plenty Regional Councils live monitoring website for up to date data on rainfall. Visit www.monitoring.boprc.govt.nz
- Local knowledge on flood levels, particularly check with landowners that have been there a long time and local iwi and hapu.
- Land Management Officers who can provide advice and support to repair or protect against streambank erosion. We can also advise on hard engineering options such as rock revetment.

AVOID THESE

- Using farm rubbish, clean fill, or green waste to repair streambank erosion.
- Realigning the streambed as this often just shifts the issue.
- Using machinery in the bed of a stream without proper authority.
- Grazing the streambank.





Gully protection

What's in a gully?

Gullies are the areas at the bottom of two hills that form long and often narrow valleys. The soil type generally consists of the material that has eroded off the adjacent slopes. They are often fertile, well drained and generally protected from wind, making them ideal for pastoral land use. Gullies concentrate overland flow during rainfall and because of the unconsolidated soil types they're particularly vulnerable to fluvial erosion.

PLAN FOR THESE

- Restrict stock camping areas on the gully floor by locating water supply to the lower slopes or side of gully out of the water flow. This will reduce bare ground and keep the grass cover intact and reduce scouring by water.
- Plant open-spaced soil conservation trees. A good example is deciduous species such as poplars that provide shade in the summer, fodder in the autumn and hold the soil together when it rains.
- Stock safety. Shift stock from gully floors if heavy rain is forecast.
- If small water channels begin to form consider re-contouring to ensure overland flow is spread evenly across the floor.
- Regularly inspect for deeper water channels. These can quickly develop into permanent gullyhead erosion features that are difficult to manage.

MAKE USE OF THESE

- Soil conservation trees.
- Detention dams or low bunds to slow water velocity and control release.



Top photo: A storm front moves over the Western Bay of Plenty. Source: Andy Belcher.
Bottom photo: This is a typical gully system with very steep sides.

- Include mat-forming pasture species in your seed mix. Consultation with your seed merchant will enable the best selection for the site conditions. Maintain a healthy pasture sward.
- Regional Council Land Management Officers can help identify potential issues in your gully systems. If you already have a gullyhead feature they can also provide assistance to help you manage this.

AVOID THIS

- Raised roads or tracks across the flow of the gully are potential dams and water control needs to be carefully installed.
- Overgrazing the gully floor will reduce ground cover, slow down regrowth and increase erosion potential. Pugging by heavy stock will reduce infiltration of water into the soil and increase run-off.



Civil defence and emergency management

Have you got an emergency management plan?

Many disasters will affect essential services and possibly disrupt your ability to travel or to communicate with each other. You may be confined to your home or forced to evacuate your community. Emergency services may take time to reach you. This is an important time to plan to look after yourself and your loved ones for at least three days. Visit www.getthru.govt.nz for more details and a template plan that can be filled out and agreed to.

PLAN FOR THESE

- Emergency survival items and getaway kits. These will contain several items that you will need for immediate comfort, first aid, food and water and communication.
- Evacuation. You should have several options for evacuation routes. Use routes specified by local authorities.
- If you have livestock, evacuate your family and staff first. If there is time, move livestock and domestic animals to a safer area. Know which paddocks are safe from floodwaters, landslides and power lines. Ensure they have food, water and shelter. Remember the responsibility for animal welfare remains with you as the owner.
- If your farm access relies on a stream or river crossing, ensure you can still reach livestock if the crossing is impassable.

MAKE USE OF THESE

- Battery powered radio tuned into your local station will provide regular updates.
- Live Bay of Plenty Regional Council flood monitoring on the website.
- Find out from your local district council if your house or property is at risk of flooding.
- Keep your insurance policy up to date and that you have sufficient cover.
- Prepare for earthquakes by identifying safe areas and securing heavy items of household furniture.



Photo: Bay of Plenty Civil Defence team preparing for flooding.

means of providing warmth and hot meals during sustained power outages.

- Have material handy for repairing windows such as tarpaulins, boards and duct tape.
- Check for potential landslides. Signs may include small slips at the bottom of cliffs, sticking windows or doors, gaps in joints, new cracks or bulges in the ground, tilting trees, retaining walls or fences.

AVOID THESE

- During storms, avoid walking around outside and driving unless absolutely necessary.
- Food or water that has been contaminated by floodwater.
- Stay out of damaged areas; look out for fallen power lines or broken gas mains.
- Use the phone only for short essential calls to keep lines free for emergency services.

RESOURCES

www.getthru.govt.nz

www.bopcivildefence.govt.nz



Photo: The Uretara Stream in Katikati cuts off access to properties during flooding.



Photo: Workers remove debris from the Wharawhara Road bridge after recent flooding.



Photo: The Waitekohe Stream Valley in flood.



The natural resources you benefit from as a landowner through soil, plants and water, is worth defending. Doing nothing could threaten the quality of future production affecting soil, crops, livestock and your lifestyle. It could decrease your land value. Our series of toolkits will help you future proof your land to ensure it remains productive and profitable.

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