

## **Riparian Management**

Water quality is one of the biggest issues facing councils at the moment, and there has been a lot of publicity with the Fonterra Accord, Rotorua lakes, and Taupo catchment just to name a few. So why is water quality such a big deal and what does it mean for the average farmer?

Most of us can agree that the natural water flowing through our streams and rivers is one New Zealand's greatest assets. To maintain this water resource, some management techniques have been developed and implemented to cope with the intensification of both urban and rural pressures.

Concern about the health of streams has required farmers to adopt new technologies and practices to improve stream health. Riparian management, by creating buffer zones is one of the strategies that farmers can use to help manage the water resource on their property.

So what does riparian management mean for the farmer? When undertaking riparian management the solution is dependent on the issue you are trying to rectify, the size of the watercourse, and the characteristics of the adjacent banks. These issues may include; poor channel or bank stability, high contaminant inputs, nitrate enrichment, lack of shade & high summer water temperatures, inadequate or inappropriate carbon inputs, severe flood flows, or low terrestrial habitat diversity.

Riparian management is not about "because you have a stream you need to fence it off." Its about managing the issue and often these can be overcome by a combination of methods including planting trees and shrubs, maintaining the grass sward, controlling or excluding stock or protecting swampy and wetland areas. For all these, to treat the problem you need to understand it.

Bank or channel instability can be caused by increased flood flows, increased sediment deposits from upstream, the removal of protective vegetation (and roots), straightening of streams which increases flow rate, and livestock treading the banks. Depending on the size of the stream, this problem can easily be fixed with controlling stock grazing, the planting of trees and shrubs, and maintaining the grass sward. If planting, consider the average high flow rates to ensure that the larger plants are positioned above this level and thus less likely to cause swirling or push the flow onto other banks areas encouraging erosion.

Contamination of waterways often results from water flowing across the soil surface during rainfall events and picking up sediment and associated nutrients, pesticides as well as bacteria and other pathogens. Control can be quite simple; just create filter strips adjacent to the waterway with the grass sward and limit the stock access to these areas.

Nitrate is a little different to overland flow contaminants. During stable flow periods, the major transfer of nitrogen from land to streams occurs as ground water nitrate. Research has shown that over 90% of this can be eliminated by having adequate wetlands/swampy

areas for denitification and adequate riparian vegetation adjacent to the watercourse. This combined with keeping stock out of waterways and wise use of nitrogen fertilisers will go a long way to improving water quality.

Too much sunlight can result in unwanted aquatic plants or algae, and increase water temperature. Water temperature can affect the distributions of aquatic animals directly by exceeding tolerances of various invertebrate and fish species and indirectly by influencing the dissolved oxygen levels. Like sunlight, water temperature fluctuations can be controlled with tree and shrub plantings.

Influencing the peak flow levels in a flood requires considering whole landscape rather than just the riparian zone. The dominant type of vegetation found in the whole catchment will dictate how quickly rainwater will reach the stream. Vegetation that slows overland flow will reduce peak flows and flood levels. Also swampy areas/wetlands play an important role as 'natures sponge', rapidly absorbing water and slowly releasing it, helping to lower peak flows.

Riparian zones will also increase biodiversity and can create ecological corridors from one piece of bush to another for our native animals. In the same token, riparian vegetation can also harbor plant and animal pests, and should be controlled and maintained to reduce later problems.

Cattle, particularly during low flows in summer can have a huge impact on water quality. The provision of alternative water will often reduce this effect significantly, and increase stock performance.

The width of the riparian zone needed to be effective is very much dependent on the slope and length of the adjacent banks, the problems that are being addressed, and the intensity of the farming being undertaken.

When undertaking riparian management to solve one problem, care must be taken not to create another problem in the same reach of the stream. A classic example of this is the planting of willows for bank stability on small streams that eventually grow into the stream causing raised stream bed and flooding upstream. Others include planting tree species that can become a weed issue down stream.

Riparian management can enhance the visual attractiveness of a farm and provide more opportunities for recreational activities. It can result in improved water quality, which can benefit stock and increase farm production, and also provides habitats for fish, birds and other animal life.

Managing these areas is important both to help with stock hazards/management, reducing the impact of the farm system both on the farms water quality and the entire catchment. It is important to remember that riparian management is not about fencing off every waterway on your property, it is about looking at all the waterways on your property,

understanding the issues of why water quality is being impacted upon, and addressing those issues.