

Riparian FACTSHEET



Ministry of
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MONITORING AND MAINTENANCE OF AGRICULTURAL RIPARIAN PLANTINGS

Effective riparian (close to water) restoration includes monitoring and maintenance of the restoration area. This factsheet presents information on the sorts of things you should consider when thinking about monitoring and maintenance of your riparian plantings. *Selecting Plants for Agricultural Riparian Plantings*, Factsheet No.4 provides information on the common species that can be used for riparian restoration in British Columbia. *Planting Riparian Plants*, Factsheet No. 6 as well as the companion factsheet *Planting Agricultural Riparian Areas*, Factsheet No.2 discuss techniques for establishing these plants in your riparian area and the considerations that go into decisions about riparian planting. This document provides information on the “care and feeding” of your riparian area.

Monitoring and maintenance are essential to keeping your riparian area in good shape and ensuring the goods and services it provides continue to be available to you and the ecosystems the riparian area serves. Monitoring and maintaining riparian plantings are much the same. You observe the condition of the riparian area then proceed to fix whatever it is you find that is wrong, or possibly, you [decide to evaluate the riparian condition on a regular basis and make small adjustments](#). That too is a conscious decision that you make and is a form of maintenance. Although monitoring activities can vary substantially depending on the intent of the monitoring program and the elements being monitored, all monitoring efforts involve checking on the status of whatever it is you are monitoring.



Monitoring vegetation

Monitoring

Monitoring agricultural riparian plantings can be as simple as checking to see how the plants you have planted are doing to elaborate systems that document a variety of attributes about your plants. A simple monitoring system that you are probably familiar with is the **Riparian Health Assessment (RHA)** found in the *Riparian Management Field Workbook*. You probably used the Riparian Health Assessment when you were considering the condition of your riparian area initially, before you undertook your planting work. You can now use that initial assessment as a baseline measure to see how much you have improved things. Go back through your initial Riparian Health Assessment and, of the factors dealing with riparian vegetation, see what factors have changed.

1. If your plantings are doing well you will find you have a greater proportion of the riparian area covered by vegetation (**RHA 1**).
2. Your plantings may be out-competing the weeds and your answer to **RHA Question 2** would reflect this.
3. Less of the riparian area should be covered with disturbance caused vegetation (**RHA 3**).
4. Of course, if you have planted woody species, then the cover of woody vegetation would be increasing as well (**RHA 4**).
5. The use of woody vegetation should be decreasing as you would have solved the problems of cows in the riparian areas (**RHA 5**).
6. The amount of standing dead wood should be decreasing as the plants you have planted take over and the standing dead wood that was there falls and becomes large woody debris (**RHA 6**).
7. Deep binding root systems help hold streambanks in place. More of the riparian area should be covered by plants (generally

woody) that have deep binding root systems (**RHA 7**).

8. A reduction in the bare ground should be apparent following riparian planting (**RHA 8**).

Positive changes in the ratings for the **Riparian Health Assessment** questions (1 through 8) that deal with riparian vegetation indicate that you are being successful in bringing your riparian area back to health.

Monitoring can also show changes in the vegetation that arise over the years following restoration work. Longer-lived conifers such as spruce, cedar and fir will replace pioneering vegetation such as alders,



willows and cottonwood that may have been established initially. These changes can be seen as seedlings of these longer-lived species start to appear in the understory. You may want to plant some of these species if you find that the cover of pioneering species is maturing and there are none of the later species growing up underneath to

take their place. Natural changes in the vegetation within the riparian area can indicate that the area is healthy and that the goods and services it provides will be available for generations to come.

Maintenance

Maintenance is the act of correcting some deficiency that has been identified during monitoring. Maintenance may be as simple as pulling a few weeds that show up or as complicated as re-designing a riparian planting program that has failed to achieve the desired results. Maintenance is typically most easily accomplished if it is attended to on a regular basis. Don't let the weeds get out of hand before you decide to do something about them – treat them while the problem is still small, you will save yourself a lot of work in the long term.

Of course maintenance activities will be specific to the site you are working on. However, there are some

general maintenance activities that are often associated with riparian plantings:

1. Control of weeds and invasive species;
2. Addressing erosion problems before they become severe;
3. Investigating and addressing infertility problems that start to appear (yellowing of leaves, poor growth, etc.); and
4. Control of animals such as beavers and muskrats that might impact the riparian area.

Maintenance activities should be guided by the information in other Factsheets. For instance, if the maintenance activity deals with weeds, then **Riparian Weed Management** will be the appropriate place to turn for help. If the subject of the maintenance is replanting riparian species, then consideration of the information in **Selecting Plants for Agricultural Riparian Planting**, Factsheet No. 2, and **Riparian Plant Acquisition and Planting**, Factsheet No. 6 will be of assistance.

Care should be taken when replacing plants that have not survived to determine why the plants did not grow. Perhaps the stems were girdled by mice and voles (look for gnaw marks on the bark low on the stems), perhaps the planted vegetation succumb to competition from aggressive grasses. Reed canary grass (*Phalaris arundinacea* L.) can form a very dense cover in riparian areas. Root competition with planted vegetation can be a problem with reed canary grass stands even where the above ground vegetation has been removed. Identification of the problem preventing the establishment of planted riparian plants is the first step in solving the problem.

Planning for Maintenance

- **PROBLEM: Small and medium-sized mammals** - Voles and other rodents can damage or eliminate new riparian plantings in a very short period of time. Unlike mice (seed eaters) voles and some other rodents will feed on above- and below-ground structures of trees and shrubs. Techniques to reduce the damage are available but must be integrated during the planning stages.
 1. Heavy weed and grass growth is the primary reason for high levels of vole damage. To reduce or prevent vole damage, control weed growth until trees and shrubs are of a size to escape predation.

2. For medium-sized mammals such as beaver, mountain beaver, porcupine and hares, tree protectors are an effective means of reducing damage.
 3. Beaver are a significant problem in some areas. If beaver are active in the area contact the local BC Ministry of Environment office for assistance.
 4. Raptor roosts may encourage avian predators, increasing the diversity of the riparian area. Although their ability to control rodent populations is limited they may reduce some damage.
- **PROBLEM: Large mammals** - Deer, elk, moose, cattle and related animals can cause significant browsing damage to shrubs and trees in riparian plantings. This is a problem that should be detected while monitoring the planting. If a problem is detected, fencing, tree protectors or repellents should be considered. Sometimes a dense planting of tall willow or cottonwood cuttings can be used to establish a riparian cover that is out of reach of large mammals
 - **PROBLEM: Weeds** - Weed control is critical if the new riparian planting is to grow and produce the desired function. A detailed weed control plan should be developed for the first 3 years after planting. This plan must be modified based on the results of monitoring.
 5. Dense plantings of trees and shrubs will occupy the space that might be invaded by weeds.
 6. Shade from planted shrubs and trees may reduce or eliminate shade intolerant aquatic and terrestrial vegetation. Trees and shrubs will only produce shade if they are provided with good growing conditions. Some plants like Reed Canary Grass are very difficult to shade out once established due to root competition.

For more information about weeds in riparian areas see Factsheet No.7 ***Riparian Weed Management.***

- **PROBLEM: moisture** - New plantings in upland zones of all riparian areas may suffer from drought during the summer. Depending on species chosen, irrigation may be necessary for planting survival. In addition, drought stressed plants are more susceptible to damage from insects and diseases. If shrubs and trees grow well for 2 or 3 years irrigation should be reduced or eliminated.

Monitoring Systems

Gaboury and Wong (1999) defined 3 types of monitoring:

1. **Implementation monitoring** where the objective is to determine if the work that has been planned is being implemented correctly. You may have planned to get the Scouts to help you plant trees along your riparian area, but if they all go in upside down, the program is not going to be very effective. Implementation monitoring can be used to address these issues early on in the process to insure work is completed correctly.
2. **Effectiveness monitoring** is used to answer the question 'Is the work that has been done effective in achieving the results I wanted?' In this case we are not asking if the work was done properly or if the approach that was taken is correct, but rather is the work effective in solving the problems (i.e. riparian shade) that have been identified.
3. **Validation monitoring** addresses the question of whether the approach that is being taken is appropriate to solving the problem. For instance, will shade improve the conditions for fish in the stream or do you need to look at other factors (maybe the large sewage outfall just upstream).

Considering these monitoring types can help you as you develop your monitoring program as knowing the questions you are trying to answer with your monitoring will help you focus on seeking the right information.

References

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