

Agricultural Buffer (Setback) Zones

March 2014



Buffer or Setback Zones (Ref. 1 & 2)

Buffer zones are defined as a strip of vegetated land between the agricultural land and a body of water. Buffer zones are the last line of defense to buffer a water body from the effects of land use activities. Protecting water bodies by maintaining adequate buffers ensures that the quality and quantity of water is protected for end users. The wider the vegetated buffer zone, the more effective it is at filtering sediment and pollutants and storing runoff. The width of a buffer zone depends on its function. Table 1 shows the recommendations on the buffer width by Agriculture and Agri-Food Canada.

Function	Buffer Zone Width
Bank Stability	5+ meters (16+ feet)
Sediment Removal	10-30 meters (33-98 feet)
Soil-Bound Nutrients	10-30 meters (33-98 feet)
Soluble Nutrients	15-50 meters (50-164 feet)
Aquatic Habitat	15-30 meters (50-98 feet)
Terrestrial Wildlife Habitat	10-300 meters (33-984 feet)

Source: "Beneficial Management Practices for Riparian Zones in Atlantic Canada," Agriculture and Agri-Food Canada and Island Nature Trust.

Benefits of Buffer Zones (Ref. 1 & 3)

- Traps and Stores Sediment:** Buffer zones create a separation between a body of water and the agricultural practices. The vegetation in the buffer (such as grass, shrubs, etc.) acts to filter out the sediment and nutrients etc. from the runoff. This reduces the infilling of the water body, which translates to reduced maintenance, and improves the quality of the runoff water from the land. In Abbotsford, this drainage water is reused for irrigations; this improved quality of drainage water would benefit the farmers downstream on the same water body.
- Bank Stabilization and Channel Movement:** Root system of the buffer zone vegetation binds the soil on the bank to help keep it together. The sediment trapped by the vegetation further builds the bank and increases its stability. The vegetation on the bank increases the surface roughness and slows surface runoff. This minimizes the impact of heavy rain, decreases bank erosion and minimize channel movement.
- Water Storage, Reduced Flooding and Aquifer Recharge:** Extensive root systems of the vegetation in the buffer zones increase the water holding capacity of the soil by improving the soil porosity. This allows more water to soak into the soil and recharge our aquifers. During high rain events, water to rivers and creeks is slowed down by storage of water at these multiple buffer zones. This lowers the water level in creeks and rivers and minimizes flooding.
- Wind Break and Soil Conservation:** Strategically planned buffer zones with trees can act as a wind barrier which helps conserve the valuable top soil. This also helps in the prevention of deposition of this soil into the ditches which reduces the maintenance requirement.
- Reduced Stream Maintenance and Improved Habitat for Wildlife:** Over hanging branches of the riparian zone vegetation along fish bearing streams reduce the amount of sunlight reaching the surface of the water. This reduces the growth of vegetation inside the channel which reduces the maintenance and other costs incurred to obtain necessary approval from various government agencies. In addition, this helps cool the water in summer months to improve the quality of water for fish and other aquatic species. The vegetated area along water bodies also provides habitat for a wide variety of wildlife.

What can I do to help? (Ref. 4)

As a landowner with a body of water (a river, stream, brook, creek, watercourse, lake, pond, spring, lagoon, ravine, gully, canal, wetland, ditch and other flowing or standing water) on your property, there are many steps you can take to create and improve buffer zones:

1. Incorporate Beneficial Management Practices (BMP) for soil conservation and water quality on your property such as grassed water ways or cover crops, etc. (see back side of this page to learn more).

2. Establish permanent buffer areas with appropriate width along the water body and avoid operating machinery in this area.
3. Plant native trees and shrubs in the buffer zones to improve diversity and to receive full benefits of having a buffer zone.

Contact your Dyking, Drainage and Irrigation Department at 604-853-5485 to discuss the possibility of creating a buffer zone on your property.

REFERENCES

1. Beneficial Management Practices for Riparian Zones in Atlantic Canada, Agriculture and Agri-Food Canada and Island Nature Trust.
2. "Fact sheet on Buffer Zones for a Healthy Watershed," Alberta Agriculture, Food and Rural Development.
3. "Riparian Products, Services and Benefits," Ministry of Agriculture and Food AB, Document obtained from Ministry of Agriculture and Food BC.
4. "Best Management Practices for Riparian Zones in Nova Scotia," Agriculture and Agri-food Canada.

Beneficial Management Practices (BMP) for Soil Conservation and Water Quality

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Beneficial Management Practices (BMP)

A practical, voluntary, economically affordable procedure or action used or taken to prevent or reduce environmental impacts from a particular land use without sacrificing productivity of that land. BMP is the first step in reducing the impacts on water quality, soil erosion, air pollution, etc. Beneficial management practices also help reduce the maintenance required on watercourses. (Ref. 1)

Different BMP and Their Benefits (Ref. 1)

- 1. Buffer Zone:** As described in the buffer zone section of this brochure, a buffer zone is the most effective way to improve the quality of water going into our watercourses. It filters out the harmful nutrients and sediment from farm run off. In addition, buffer zones help with bank stabilization, water storage, soil conservation, reduced watercourse maintenance and aquifer recharging.
- 2. Cover Crops:** Cover crops are an excellent way to reduce soil erosion, improve soil structure, control pests and disease and remove excess nutrients from the soil that might otherwise go into our ground water. In flat areas of Abbotsford, the north-east wind in the winter months blows the soil from uncovered lands and fills in the drainage watercourses and consequently increases the maintenance costs.
- 3. Filter Strips:** A grass or other permanently vegetated strip (other than trees or shrubs) at the lower end of the crop field helps reduce the amount of sediment, organic material, nutrients, pesticides and other pollutants in the surface runoff from entering in the water body.
- 4. Grassed Waterways:** Broad, shallow, permanently grassed channels that can occur naturally or can be constructed to accept collected runoff from diversion terraces to slow water flow, prevent soil erosion, filter water and direct water to a safe outlet where sediment, etc. can be collected.
- 5. Strip Cropping:** The practice of growing two or more crops across a field wide enough for independent cultivation improves soil quality, slows surface water flow and increases the infiltration rate, which improves soil moisture. This method is commonly practiced in hilly areas to prevent soil erosion.
- 6. Wind Breaks:** Trees can be planted strategically around the farm to reduce wind erosion, snow drifts, preserve soil heat and moisture for crops, provide shelter for livestock and protect crops from wind damage. Properly designed windbreak can also help protect barns and homes from wind damage and keep them cool in the summer months. In flat areas of Abbotsford, infilling of ditches with soil or snow is largely caused by lack of or improperly designed wind breaks. This increases the need for ditch cleaning to ensure proper drainage and increases the maintenance costs. Before installing wind breaks on you farm, please contact our Dyking, Drainage and Irrigation Division for proper placement of trees.



Cover Crop on an Abbotsford Farm



Windbreak on an Abbotsford Farm



Managed Buffer Strip on an Abbotsford Farm

Please contact the City of Abbotsford's Dyking, Drainage and Irrigation Division at 604-853-5485 for further information or ideas about implementing these BMP on your farmland.

REFERENCE

1. Beneficial Management Practices for Riparian Zones in Atlantic Canada," Agriculture and Agri-Food Canada and Island Nature Trust.