



INFOSHEET #21

STREAM, DITCH AND FLOODPLAIN MANAGEMENT

How to address concerns identified in your Environmental Farm Plan Worksheet #21



Based on
Environmental Farm
Plan Workbook,
4th ed. 2013

This infosheet outlines options to address concerns identified in your Environmental Farm Plan (EFP) as they relate to stream, ditch and floodplain management.

All options are classed as **Actions** or **Compensating Factors**.

- **Actions** address the identified concern, and will change the EFP rating to (3) or Best (4).

- **Compensating Factors** are alternatives that will adequately address the concern, but will not change the rating in the EFP worksheet.

In most cases, you'll need more information before choosing and implementing options. Sources for more information are noted at the end of this infosheet.

For help with technical terms, please see the full glossary in your EFP Workbook.

STREAMS AND DITCHES

21-1. Buffer strips for stream bank and ditch bank stabilization

BACKGROUND	WHAT CAN YOU DO?
<p>Buffer strips stabilize stream/ditch banks, and to a lesser degree filter sediment and pesticides. Without buffer strips, the potential for bank erosion, slumping, and the entry of sediment, pesticides and nutrients into watercourses increases dramatically, especially during extreme weather events with intense rainfall.</p>	<p>OPTION 1 – ACTION</p> <p>Establish a permanently vegetated buffer strip at least 3 m (10 ft) wide:</p> <ul style="list-style-type: none"> • use natural vegetation (trees, shrubs, grasses) for ease of maintenance • check whether approval from local municipality is required to plant trees along a municipal drain • restrict cattle access during establishment of the buffer strip.



Healthy riparian zones act as living filters, trapping sediments and other materials from upland activities.

21-2. Entry of surface water

BACKGROUND	WHAT CAN YOU DO?
<p>Washouts and bank damage can occur when surface water, in concentrated flows, enters streams and ditches at unprotected locations. Sediment is lost to the watercourse as a result.</p>	<p>OPTION 1 – ACTION</p> <p>Direct surface water to protected outlets such as chute spillways or drop-pipe inlets:</p> <ul style="list-style-type: none"> • where surrounding lands are flat, note that vegetated earthen berms will be needed alongside the watercourse to direct water to protected outlets. <p>OPTION 2 – ACTION</p> <p>Construct water and sediment control basins (WASCoB):</p> <ul style="list-style-type: none"> • intercepts the flow of surface water, storing it for up to 24 hours and slowly releasing it through a perforated riser pipe • requires careful examination of surrounding topography, and typically can handle no more than 20 ha (50 ac) of surface water.



Surface inlets move excess surface water on cropland to subsurface drainage systems in a controlled manner that reduces soil loss.

OMAFRA has factsheets, design sheets, and manuals about erosion control structures. This factsheet provides an overview of what's involved:

- The Planning and Maintenance of an Erosion Control System, Order no. 97-015

21-3. Tile outlets

BACKGROUND

By protecting tile outlets, you reduce sedimentation of streams and ditches. Water quality will improve and drains will require less maintenance.

Federal, provincial and municipal legislation is in place to help ensure that everyone working in or around water is giving due consideration to all users, including private landowners and the general public, as well as aquatic life. For more information on the legal aspects of cropland drainage, see page 60, Cropland Drainage, Best Management Practices publication BMP 25E.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Prevent erosion at tile outlets:

- provide erosion protection for all tile outlets, e.g. use rock riprap
- reduce the number of tile outlets to a minimum by installing a main header tile to intercept lateral tile lines
- seek approval from the appropriate authority for all activities in or along watercourses.



Proper placement and design of drainage outlets is important to prevent bank erosion and maintain stability of the outlet.

21-4. Bank conditions (streams and ditches)

BACKGROUND

When banks are in poor condition with little vegetation, soil sediment is lost to the watercourse. This reduces water quality and increases maintenance for you and other landowners.



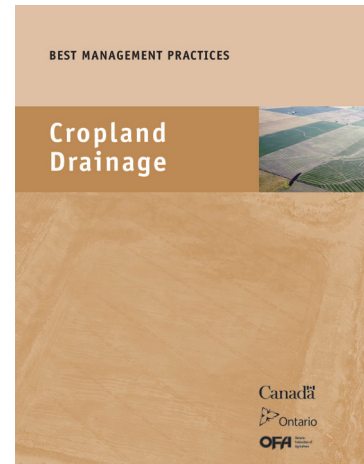
A thick cover of vegetation will stabilize the banks and greatly reduce maintenance requirements.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Maintain a vegetative cover on the bank:

- ensure bank side-slopes are not too steep – no steeper than 2 horizontal:1 vertical
- select vegetative cover for longevity and low maintenance (native species preferred)
- where excessive scouring occurs along ditch bends, note that erosion protection may be required.



This BMP book considers drainage as part of an overall on-farm soil management system, so that many complementary BMPs for erosion control and healthy soils, cropland and adjacent natural areas apply. You'll find BMPs for surface drainage such as inlets and erosion control structures. Subsurface drainage systems, options and troubleshooting tips are described in detail.

21-5. Stream and ditch inspection

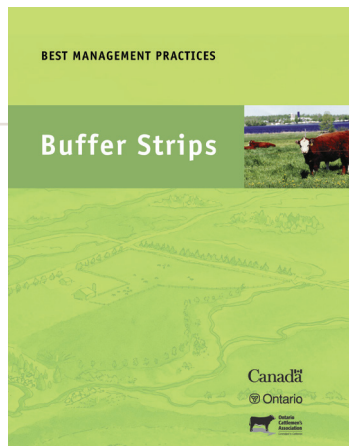
BACKGROUND	WHAT CAN YOU DO?
<p>If you don't regularly inspect streams and ditches, problems can become expensive and difficult to address.</p>	<p>OPTION 1 – ACTION</p> <p>Do regular inspections:</p> <ul style="list-style-type: none"> • inspect in the spring and fall for signs of erosion on the banks • pay close attention to tile outlets and surface water entry points • check tile outlet water quality for colour, odour and foaming • if any damage or problems are found, take action as soon as possible.



Landowners should know the location of outlets on their property. This will help with monitoring and maintenance.

21-6. Extensive livestock production system (low density)

BACKGROUND	WHAT CAN YOU DO?
<p>Livestock grazed or pastured on a low density (extensive – 1 cow-calf pair/ac/yr or less) must be discouraged from entering streams and ditches to prevent damage to banks. Increased sediment loading and manure deposits can impair water quality and negatively impact fish habitat.</p> <p>There are only two choices for streamside grazing: exclude or manage!</p>	<p>OPTION 1 – ACTION</p> <p>Maintain a good vegetative cover on the stream and ditch bank and discourage livestock from entering watercourses:</p> <ul style="list-style-type: none"> • repair any damage to stream and ditch banks immediately • provide a clean water supply, salt and shade away from the watercourse. <p>This is NOT an option for intensive livestock operations.</p> <p>OPTION 2 – ACTION</p> <p>Fence livestock out of stream or ditch.</p>



Well-managed buffer strips go a long way to filtering farmland runoff before it enters streams, wetlands, ponds and lakes.

This BMP book explains how to establish, maintain, and improve buffer strips according to the topography and land uses on your property.

21-7. Intensive livestock production system (high density)

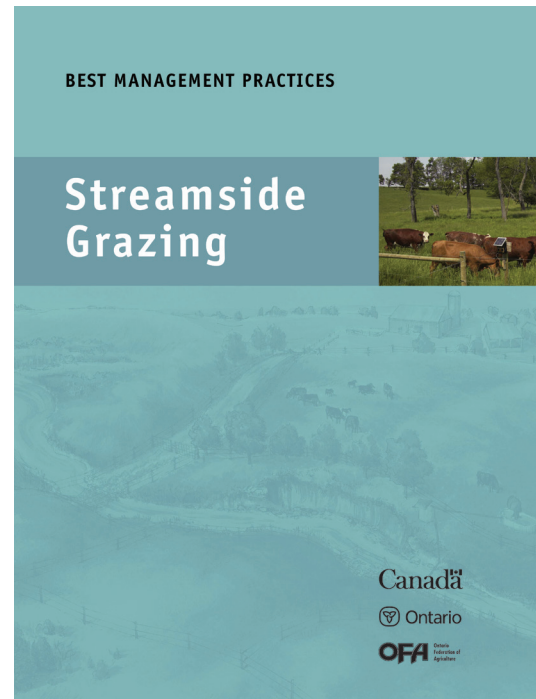
BACKGROUND	WHAT CAN YOU DO?
<p>In high density systems (intensive – more than 1 cow-calf pair/ac/yr), allowing livestock access to streams and ditches will increase herd health problems, increase sediment loading to the watercourse, and increase bacteria levels from manure deposits.</p> <p>An example of intensive livestock use is a drylot system where the area is used mainly as an exercise yard for cattle, and feed is brought in from an outside source.</p>	<p>OPTION 1 – ACTION</p> <p>Fence livestock from watercourse:</p> <ul style="list-style-type: none"> • fence all livestock from the ditch or stream • provide a buffer zone between the fence and watercourse • provide an adequate water supply away from stream or ditch • seek approval from local municipality if required to fence along a municipal drain • if necessary, provide a mid-level, high-level/high-flow or bed-level crossing to allow cattle access to other side of watercourse • explore all options re: suitable water system and watercourse crossing • obtain approval from the appropriate agency to install crossings. (Your local Conservation Authority is a good first contact.)



A fenced, bed-level crossing will manage livestock impact on the watercourse while providing access to pastures.

For more about crossings, see this OMAFRA factsheet:

- Low Flow, Mid-Level Stream and Ditch Crossings with Culverts, **Order no. 92-143**



Properly planned and managed, streamside grazing can benefit the environment through improved buffers, controlled access, appropriate crossings, rotation and layout.

This BMP book will help you develop a workable grazing management plan for your property to balance production and environmental goals.

FLOODPLAIN

21-8. Extensive livestock production system (low density)

BACKGROUND	WHAT CAN YOU DO?
<p>Livestock that spend considerable time on a floodplain can trample it and damage the vegetation. This increases the risk of sediment and manure reaching a watercourse during high flood periods.</p>	<p>OPTION 1 – ACTION</p> <p>Maintain vegetative cover on floodplain:</p> <ul style="list-style-type: none"> • provide a clean water supply, shade, salt, etc. at a distance from the stream and floodplain area • maintain a good cover of natural vegetation on floodplain and provide a well-managed rotational grazing system • during wet periods, keep livestock away from floodplain area where trampling is likely to occur. <p>Note: this option only applies to low density operations. It is NOT an option for intensive livestock operations.</p>



Provide a clean water supply at a distance from the stream and floodplain area.

21-9. Intensive livestock production system (high density)

BACKGROUND	WHAT CAN YOU DO?
<p>Livestock at high density levels should not be allowed free access to floodplains. Livestock can severely trample the area. They will also deposit manure, which, during high flood periods, will be flushed into the watercourse, impairing water quality.</p> <p>An example of intensive livestock use is a drylot system where the area is used mainly as an exercise yard for cattle, and feed is brought in from an outside source.</p>	<p>OPTION 1 – ACTION</p> <p>Fence livestock from the floodplain:</p> <ul style="list-style-type: none"> • create a wide buffer zone along the floodplain edge to help filter out the manure flowing from any outside lot for livestock • provide adequate water supply away from floodplain area • ensure all livestock are fenced from the floodplain. <p>OPTION 2 – ACTION</p> <p>Practise dry season only pasturing. Create and implement a floodplain vegetation management plan.</p>

Supplying drinking water away from surface water can help keep cattle away from banks and surface water. See this OMAFRA factsheet for more information:

- Alternative Livestock Watering Systems, Order no. 04-02

Explore your options for fencing. Discuss with your supplier, and see this OMAFRA factsheet:

- Farm Fencing Systems, Order no. 08-035



Corridor fencing will provide streambank protection. Outside the corridor there are season-long or intensive grazing management options.

21-10. Cropping of floodplain area

BACKGROUND	WHAT CAN YOU DO?
<p>Intensively cropping a floodplain will result in sediment, nutrients and pesticides moving to the watercourse, contaminating surface water.</p> <p>Grazing is an acceptable use of the floodplain.</p>	<p>OPTION 1 – ACTION</p>
	<p>Limit cropping on floodplain:</p> <ul style="list-style-type: none"> • crop floodplain in a way that causes minimal disturbance to soil • limit crops to woodlot or forage hay; add minimal nutrients • when planning floodplain use, consider frequency and duration of floodplain flooding and adjust activities or uses accordingly.
	<p>OPTION 2 – ACTION</p>
	<p>Grow row crops in rotation with forages.</p> <p>Protect soil over winter with ground cover or through crop residue management, e.g. no-till.</p>
<p>OPTION 3 – ACTION</p>	
<p>Leave floodplain idle (with vegetative cover).</p>	



See these and other BMP publications for options, considerations and tips to make the best use of floodplains and marginal or sensitive areas.

FOR MORE INFORMATION

Ontario Ministry of Agriculture, Food and Rural Affairs

Many sources of supplementary information are available. Below are some suggestions to get you started. Most can be found online at www.ontario.ca/omafra or ordered through ServiceOntario.

Alternative Livestock Watering Systems, Order no. 04-027

Drainage Guide for Ontario, Publication 29

Farm Fencing Systems, Order no. 08-035

Livestock Access to Watercourses, Order no. 08-013

Low Flow, Mid-Level Stream and Ditch Crossings with Culverts, Order no. 92-143

Maintenance of a Subsurface Drainage System, Order no. 13-037

Planning and Maintenance of an Erosion Control System, Order no. 97-015

Soil Erosion – Causes and Effects, Order no. 12-053

Subsurface Drainage System Outfalls, Order no. 13-035

BEST MANAGEMENT PRACTICES

BMP publications are excellent sources to better understand on-farm environmental issues and discover a range of proven, practical options to address them. BMP materials are available at no charge to Ontario farmers. Below are a few sample titles. To order, see ServiceOntario information.

Buffer Strips

Controlling Soil Erosion on the Farm

Cropland Drainage

Irrigation Management

Field Crop Production

Fish and Wildlife Habitat Management

No-Till: Making it Work

Soil Management

Streamside Grazing

Water Management

Inquiries to the Ontario Ministry of Agriculture, Food and Rural Affairs

Agricultural Information Contact Centre

Ph: 1-877-424-1300

Email: ag.info.omafra@ontario.ca

Web: www.ontario.ca/omafra

Order through ServiceOntario

Online at ServiceOntario Publications – www.ontario.ca/publications

By phone through the ServiceOntario Contact Centre

Monday–Friday, 8:30 am–5:00 pm

416-326-5300

416-325-3408 TTY

1-800-668-9938 Toll-free across Ontario

1-800-268-7095 TTY Toll-free across Ontario

ACKNOWLEDGEMENTS

At the request of the Ontario Farm Environmental Coalition, consisting of Farm & Food Care Ontario, the Ontario Federation of Agriculture, and the Christian Farmers' Federation of Ontario, the following organizations and people contributed to the revision of this infosheet:

Infosheet #21 Contributing Authors: Jack Kyle (Chair), Adam Hayes, Donna Mundie, Jim Ritter, Rebecca Shortt, Sid Vander Veen – Ontario Ministry of Agriculture, Food and Rural Affairs; Andrew Jamieson – Agriculture and Agri-Food Canada; Jeremy Downe – Dairy Farmers of Ontario; Tracey Ryan – Grand River Conservation Authority; Hal Schrader – Ontario Ministry of the Environment, Conservation and Parks; Jeremy Downe, Rob Fox – Ontario Ministry of Natural Resources and Forestry; Pat Learmouth – Ontario Soil and Crop Improvement Association

Infosheet Technical Editing Committee: H.J. Smith (Chair), Kevin McKague, Ted Taylor, Daniel Ward – Ontario Ministry of Agriculture, Food and Rural Affairs; Jim Myslik – Consultant



Best Management Practices publications present in-depth explanations, tips and advice for Ontario farmers.