environmental farm plan
sustainably farmed

INFOSHEET #21

WATER FEATURE MANAGEMENT

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

Based on Environmental Farm Plan Workbook, 5th ed. 2025

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

All options in this infosheet are classed as **Actions** or **Compensating Factors**.

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

Sustainable Canadian Agricultural Partnership
OSCIA
Ontario
Canada

STREAMS, DITCHES, WETLANDS AND PONDS

21-1. Buffer strip management

BACKGROUND

Buffers strips are useful for a variety of reasons. They provide bank stabilization, and both intercept and slow runoff thereby providing water quality benefits by filtering sediments and other contaminants out of surface water. Surface water quality can also have an impact on groundwater quality.

They are also critical for the creation of habitat for wildlife such as ground-nesting birds, waterfowl, and pollinators and for the maintenance of the health of the water feature.

If the perimeter is only partly protected, any contaminated surface flows may enter directly through gaps in the buffer. Farming practices such as tillage and application of nutrients and pesticides on lands adjacent to the wetlands and ponds also play a critical role in determining the water quality.

Riparian buffers along drains could decrease maintenance costs associated with drain cleanouts.

A good buffer design includes trees and shrubs for shade and bank stabilization with a grassed buffer for filtration and separation.

WHAT CAN YOU DO?

Ponds are fragile ecosystems and could be directly connected to the quality of the drinking water for your family and livestock. Livestock access to wetlands or ponds should be restricted.

OPTION 1 – ACTION

Manage new and existing buffer strips to maximize effectiveness:

- create natural permanent buffers greater than 3 m (10 ft.) for streams and ditches and 16 m (52.5 ft.) for wetlands
- prevent livestock access to the buffer
- delay mowing until mid-July or until fledgling migratory birds have left the area (whichever is later) and use a flushing bar
- otherwise, don't disturb, e.g., no spring burn – leave for wildlife
- don't apply fertilizer or pesticides to the buffer
- choose grasses (preferably native) and wildflowers, shrubs or trees that will compete and establish readily and enhance biodiversity
- link, where feasible, the wetland and wildlife pond buffers to adjacent woodlots by using grasses, swales, fencerows, etc.
- ensure that trees and shrubs are located away from any nearby tile drainage systems

OPTION 2 – ACTION

Use preferred field crop management techniques as discussed in Worksheet #19, such as no-till or reduced tillage on fields beside a water feature buffer:

- leave over 30% of the soil surface covered with crop residue after planting
  - residue helps restrict the movement of sediments, nutrients and pesticides to the wetland/pond – excess nutrients result in algal blooms, which lower dissolved oxygen levels and impact water quality and wildlife survival
- minimize potential conflicts with wildlife by growing forages or hay adjacent to wetlands and wildlife ponds when possible
- reduce soil erosion and the movement of sediments with grassed waterways, water and sediment control basins, contour and strip cropping, etc.
- recognize that wildlife within some wetlands may use some planted crops as a seasonal source of food and cover

WHAT CAN YOU DO?, *continued*

OPTION 3 – ACTION

If you are considering conducting maintenance on a drain, contact your local drainage superintendent.

It is possible that a waterway on a farm could be a petition (commonly known as a municipal) drain. Once the drain is constructed, it becomes part of the municipality's infrastructure. If you have a petition drain on your property, you cannot modify it.

Contact your local drainage superintendent to get information on the process to request an improvement to the drain. To determine if an existing municipal drain affects your property, contact the local municipality. Municipalities keep the official documents for municipal drains which includes an engineer's report, adopted by by-law.

21–2. Entry of surface water

BACKGROUND

Washouts and bank damage can occur when water (surface and tiles), in concentrated flows, enters water features at unprotected locations. Sediment is lost to the water feature as a result.

If the water feature is a municipal drain, the only permitted action is to contact the local drainage superintendent.

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

WHAT CAN YOU DO?

OPTION 1 – ACTION

Direct surface water to protected outlets such as rock chute spillways or drop-pipe inlets:

- where surrounding lands are flat, note that vegetated earthen berms will be needed alongside the watercourse to direct water to protected outlets
- construct water and sediment control basins (WASCoB) to:
  - intercept the flow of surface water, storing it for up to 24 hours and slowly releasing it through a perforated riser pipe
  - each WASCoB can handle no more than 20 ha (50 ac.) of surface water

OPTION 2 – 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

OMAFA has factsheets, design sheets, and manuals about erosion control structures.

This factsheet provides an overview of what's involved: Agricultural erosion control structures.

AgriSuite has the AgErosion tool for planning and sizing commonly-applied agricultural erosion control structures.

21–3. Bank conditions

BACKGROUND

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

If the water feature is a municipal drain, the only permitted action is to contact the local drainage superintendent.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Maintain a vegetative cover on the bank:

- ensure bank side-slopes are not too steep for the local soil type
- select vegetative cover for longevity and low maintenance (native species preferred)
- where excessive scouring occurs along ditch bends, erosion protection may be required
- seek approval from the appropriate authority for all activities in or along watercourses

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

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.

21–4. Water feature inspection

BACKGROUND

Regularly inspect water features, tile outlets, drop structures, etc., to prevent problems from becoming expensive and difficult to address.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Do regular inspections:

- inspect, at a minimum, in the spring and fall or additionally after a major rainfall or runoff event for signs of erosion
- pay close attention to tile outlets and water entry points
- check tile outlet water quality for colour, odour and foaming
- keep records of inspections

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

21–5. Livestock grazing adjacent to water features

BACKGROUND

Allowing livestock access to water features may increase herd health problems, increase sediment loading to the watercourse, and increase bacteria levels from manure deposits.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Fence livestock from water features:

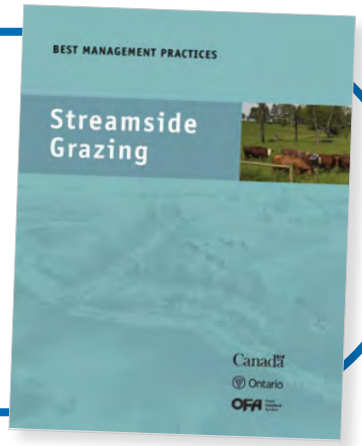
- provide a buffer zone between the fence and the water features
- provide an adequate water supply away from the water features
- seek approval from local municipality if required to fence along a municipal drain
- if necessary, provide a mid-level, high-level/high-flow or bed-level crossing to allow cattle access to other side of watercourse
- 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.

Best Management Practices: Streamside Grazing

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 VEGETATION MANAGEMENT

21-6. Livestock production system in floodplains

BACKGROUND

Livestock 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 transported into the watercourse, impairing water quality.

Supplying drinking water away from surface water can help keep livestock away from banks and surface water. Refer to this OMAFA factsheet for more information:

Livestock access to watercourses

WHAT CAN YOU DO?

OPTION 1 – ACTION

Fence livestock from the floodplain:

- provide adequate water supply away from floodplain area

OPTION 2 – ACTION

Practice dry season only pasturing.

Create and implement a floodplain vegetation management plan. Contact your local Conservation Authority for information about farming in the floodplain.

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

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

21-7. Cropping of floodplain area

BACKGROUND

Intensively cropping a floodplain will result in sediment, nutrients and pesticides moving to the watercourse, contaminating surface water.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Limit cropping on floodplain:

- 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

OPTION 2 – ACTION

Include forages in rotation with row crops or horticulture crops.

Protect soil over winter with ground cover or through crop residue management, e.g., no-till.

OPTION 3 – ACTION

Retire floodplain from cropping.

WATER FEATURE MANAGEMENT

21-8. Wetland and pond water management and restoration

BACKGROUND

Unrestricted water use or drainage may adversely affect fish and wildlife populations and can damage plant and soil resources of the wetland or pond.

Legislation addresses many activities concerning wetlands and wildlife ponds. It is advisable to contact local conservation organizations and regulatory authorities (e.g., Conservation Authority) before taking any action.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Limit or refrain from taking water from wetlands:

- during times of fish or wildlife reproduction
- do not artificially drain water from wetlands or wildlife ponds
- obtain a Permit to Take Water from the Ministry of the Environment, Conservation and Parks (MECP) if more than 50,000 L of water are to be taken in a 24-hour period for irrigation
- stop or reduce water use during dry/drought conditions

OPTION 2 – ACTION

Consult your local conservation organizations and regulatory authorities regarding the need for permits before modifying, enlarging, redesigning or re-establishing wetlands and ponds:

- verify any proposed modifications to a wetland or pond
- manage and optimize water levels, vegetation and habitat conditions for waterfowl and other wildlife in wetlands and ponds (e.g., use water-level control structures such as beaver baffles to minimize excessive flooding caused by beavers)

Optimizing water levels is not necessarily the same as maximizing or maintaining high water levels. Annual fluctuations in water levels in a wetland are normal.

This pond has been restored by the landowner in consultation with local conservation organizations and regulatory authorities to enhance wildlife habitat and water quality.

Irrigation Management and Cropland Drainage offer the latest information to help you make the most efficient use of these technologies, while minimizing environmental impacts. All BMP publications present an array of options.

HABITAT, BIODIVERISTY AND SPECIES AT RISK

21–9. Habitat management around and in water features

BACKGROUND

Fish and wildlife need living space (habitat). They can only survive if the habitat provides food, shelter and water. This is why healthy water features and riparian areas, including buffer strips should be left undisturbed.

Work in and around wetlands may be regulated by the Conservation Authorities Act and subject to permitting by a conservation authority.

Drainage can change the quantity and quality of water entering wetlands, which can negatively impact their health.

Once water features are adequately protected with buffers, there are additional opportunities to enhance them. Recognize the value of natural water features, practise informed land stewardship, and enjoy their many functions and characteristics.

Stop or reduce water-taking from ponds during low water periods.

For options and tips to restrict livestock access and provide alternative water sources, see this BMP publication.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Enhance and maintain the health of the water feature by:

- maintaining and enhancing buffers and grassed waterways
- investigating and addressing any water quality concerns of water entering a water feature
- referring to Worksheet 16 – Managing Nutrients in Growing Crops and Worksheet 17 – Use and Management of Manure and other Organic and Other Prescribed Materials for more information on crop land management

OPTION 2 – ACTION

Enhance the habitat of water features by:

- consulting habitat professionals to determine where existing wetland and pond habitat could be enhanced e.g., waterfowl nesting structures and desirable wetland/pond plant species
- leaving healthy plant cover to function on its own
- enhancing water feature habitat by expanding wetlands or ponds
  - engage expert advice to install or manage existing water level control structures to maximize wetland plant and wildlife habitat
  - consult your local conservation organizations and regulatory authorities regarding the need for permits before modifying, enlarging, redesigning or re-establishing wetlands and ponds

OPTION 3 – ACTION

Minimize disturbance to water features by:

- avoiding disruption of highly sensitive habitats especially during critical times e.g., pollination, breeding or nesting
- being aware that excess water withdrawal may have negative impacts on wetland plants, amphibians, fish and waterfowl
- engaging a registered professional forester when planning a timber harvest in and around wetlands and ponds to ensure that habitats are protected
  - consult your local conservation organizations and regulatory authorities regarding the need for permits before harvesting trees in and around wetlands and ponds

OPTION 4 – ACTION

The **Ontario Habitat and Biodiversity Assessment Tool** is a free online tool that allows you to understand local natural species and habitats, and provides recommendations to improve habitats and biodiversity.

Naturalized ponds offer good wildlife habitats but are very sensitive to continual access by livestock.

21-10. Habitat connectedness

BACKGROUND

Habitat connectedness on a farm is crucial for wildlife and healthy ecosystems. When separate patches of habitat are well-connected, plants and animals can move freely between them. High connectivity helps maintain natural processes that support clean air, rich soil, and healthy watersheds.

Without it, ecosystems become fragmented leading to disruption in ecosystem function, reduced biodiversity, and significant changes in the landscape.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Identify habitat connections that may have been previously removed and plan for their re-establishment and protection.

Identify opportunities for new habitat connections between aquatic, riparian and other natural features where appropriate considering agricultural activities.

OPTION 2 – ACTION

The **Ontario Habitat and Biodiversity Assessment Tool** is a free online tool that allows you to understand local natural species and habitats, and provides recommendations to improve habitats and biodiversity.

21-11. Species at risk awareness

BACKGROUND

Protecting and recovering species at risk and their habitat is a key part of conserving Ontario's biodiversity. Species at risk are protected by both Federal and Provincial legislation so it is important to be aware of which species may frequent or inhabit your farm.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Determine which species at risk may be on your farm based on the areas of the province they inhabit, and which habitats (of those that exist on your farm) support these species. Resources include species lists, distribution maps, and other guidance material provided by the Ministry of Natural Resources. Online citizen science forums such as **iNaturalist** can show you which species at risk have been sighted in your area.

Once you become more familiar with which species at risk are located within your area of the province and which habitats on your farm could support them, conduct your own observations on farm and record any sightings.

Learn more about the lifecycle and habitat needs of any species at risk that are observed or have a high likelihood of frequenting or inhabiting your farm (e.g., nesting habits) and incorporate these needs into farming practices (e.g., delayed hay harvest).

OPTION 2 – ACTION

The **Ontario Habitat and Biodiversity Assessment Tool** is a free online tool that allows you to understand local natural species and habitats, and provides recommendations to improve habitats and biodiversity.

21-12. Species at risk and habitat protection in and around water features

BACKGROUND

There are many practices on your farm that can support or protect species at risk. There may also be activities you can modify to reduce harm to species at risk or their habitat.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Become more aware of practices you can take, or may already be doing, that promote species at risk by finding information on the species and their habitats.

OPTION 2 – ACTION

Learn about and consider a voluntary conservation agreement or easement that protects natural habitats and restrict certain activities on your property. These agreements can help in conserving species at risk and biodiversity well into the future.

OPTION 3 – ACTION

The **Ontario Habitat and Biodiversity Assessment Tool** is a free online tool that allows you to understand local natural species and habitats, and provides recommendations to improve habitats and biodiversity.

21-13. Invasive species

BACKGROUND

Invasive species are plants, animals and micro-organisms that, when introduced outside of their natural environment, out-compete native species. These species can have harmful impacts to the natural environment, economy, farming operations, and society.

Invasive aquatic plants displace native vegetation, slow down water flow, alter oxygen levels, and can affect recreational activities (e.g., boating, fishing and swimming).

WHAT CAN YOU DO?

OPTION 1 – ACTION

Regularly inspect water features and surrounding areas for the presence of invasive species. Consult **resources** from the Ministry of Natural Resources to learn about how to identify invasive species.

OPTION 2 – ACTION

If you find invasive plants in or around your water features and riparian areas (including buffer strips), eradicate them or manage them so they don't spread. Depending on the species, you may need to use manual, mechanical or cultural control practices.

Herbicide use is limited in aquatic environments. Contact the Ministry of Environment, Conservation and Parks for more information or to seek necessary licenses and permits for herbicide use.

FOR MORE INFORMATION

ONTARIO MINISTRY OF AGRICULTURE, FOOD AND AGRIBUSINESS (OMAFA)

- Agricultural Information Contact Centre (AICC)
  Toll free: 1-877-424-1300 | e-mail: ag.info.omafa@ontario.ca

  Find most of the resources listed below at www.ontario.ca

Publications

- Drainage Guide for Ontario, Publication 29
- Agricultural Erosion Control Structures: A Design and Construction Manual, Publication 832

Factsheets

- Considerations when planning to drain land
- Livestock access to watercourses
- Agricultural erosion control structures
- Maintenance of a subsurface drainage system
- Soil erosion – causes and effects
- Subsurface drainage system outfalls
- Minor improvement projects under the Drainage Act, 1990

ONTARIO MINISTRY OF AGRICULTURE, FOOD AND AGRIBUSINESS (OMAFA), *continued*

Best Management Practices Series

- Field Crop Production
- Water Management
- Fish and Wildlife Habitat Management
- Buffer Strips
- Fish and Wildlife Habitat Management
- Cropland Drainage
- Controlling Soil Erosion on the Farm
- Irrigation Management
- No-Till: Making it Work
- Soil Management
- Streamside Grazing
- A Phosphorus Primer
- Establishing Tree Cover
- Water Wells
- Woodlot Management

Other Resources

- AgriSuite – AgErosion tool

ONTARIO MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS

- Species at Risk
- Natural Heritage Reference Manual
- Drainage Act and Conservation Authorities Act protocol

ONTARIO MINISTRY OF NATURAL RESOURCES

- Habitat Management Guidelines for Waterfowl in Ontario
- Invasive species in Ontario

FOR MORE INFORMATION, *continued*

GOVERNMENT OF CANADA

- Species at Risk

OTHER RESOURCES

- Conservation Ontario
- Royal Ontario Museum
- Invasive Species Centre
- Ducks Unlimited Canada
  - Guidance for Ontario Landowners
- Ontario Nature
- Ontario Federation of Anglers and Hunters
- Ontario Biodiversity Council
- Ontario Soil and Crop Improvement Association
- Soil and Water Conservation Society

LEGISLATION/ACTS

- Fisheries Act, 1985
- Conservation Authorities Act, 1990
- Species at Risk Act, 2002
- Migratory Bird Conservation Act, 1994
- Drainage Act, 1990 and Conservation Authorities Act, 1990
- Ontario Water Resources Act, 1990