



Success with ALUS Wetland Projects

How to establish and maintain wetland
projects in ALUS' Eastern Hub

AN ALUS GUIDEBOOK



Types of Wetland Projects

Wetlands are expanses of land that are seasonally or permanently covered by shallow water, where the water table is often close to, or at, the surface of the soil. Wetlands provide a range of ecosystem services that benefit communities, including drought and flood mitigation, water filtration and wildlife habitat. In fact, they are among the most diverse and productive wildlife habitats in the world, critical for mammals, birds, fish and invertebrates. Properly established and cared for, your ALUS wetland will become a hive of activity, sustaining a wide variety of birds and wildlife and

producing valuable ecosystem services that benefit your community.

Canada has five main types of wetlands (marshes, swamps, bogs, fens and shallow open water), but ALUS' wetland projects typically focus on marshes and shallow, open-water wetlands. Wetland projects that can be established and maintained on your property through the ALUS program include creating dug-out wetlands fed by surface water or groundwater, enhancing ephemeral (seasonal) wetlands, restoring wet meadows and engineering impoundment wetlands.

Dug-Out Wetlands



In some locations, ALUS recommends creating a dug-out wetland on your land, using excavation or other means to create a reservoir and either expose the groundwater or capture surface water from the surrounding watershed. Surface water dug-outs are most successful where there is a watershed large enough to fill the wetland, along with clay soils to prevent the wetland from draining away, whereas exposed groundwater dug-outs are suitable for areas with a high water table, and do not require clay soils.

Ephemeral (Seasonal) Wetlands



For other locations, ALUS advises enhancing ephemeral wetlands. Ephemerals are depressions in the landscape that temporarily hold water, usually in spring and late fall, and during heavy rain events. They will typically dry out in mid-to-late summer. Ephemeral wetlands provide important spring breeding habitat for many frog, toad and salamander species.

Ecosystem Services Produced by ALUS Wetland Projects

CLEANER WATER: ALUS wetland projects help improve water quality, both locally and for communities downstream. By acting as filters and settling areas for runoff water, wetlands allow nutrients, sediment and particulates to be removed before entering the waterways.

FLOOD AND DROUGHT MITIGATION: ALUS wetlands help store water on the landscape, preventing it from flowing

rapidly away. This helps reduce flooding downstream, and helps retain moisture locally during periods of drought.

MORE BIODIVERSITY: ALUS wetland projects support numerous bird, insect, plant and mammal species and slowly release water to ensure continued habitat for aquatic and semi-aquatic species during dry periods.

Wet Meadows



For poorly drained areas on your land, ALUS may advise restoring a type of wetland known as a wet meadow. These wetlands often occur in low-lying areas of farmland, or adjacent to existing wetlands. While similar to a marsh, they do not generally have exposed, standing water. They are home to unique combinations of wetland wildflowers, grasses, sedges and rushes.

Impoundment Wetlands



In certain situations, ALUS will assist in engineering an impoundment wetland. These types of wetlands are supplied by surface water and generally require one or more water outlet structures (rock chutes, spillways, water control structures) and berms. They can be quite large in size. Proper engineering is required.

What to Expect while Establishing a Wetland Project



When you establish a wetland project through the ALUS program, you can expect the process to take several years. The waterbody portion of the project is generally in place within one year, but the surrounding wetland and buffer vegetation may take several years to establish. By year three, a properly established wetland project becomes a beautiful landscape of both aquatic and terrestrial habitat. Here is a sneak preview of what to expect for the first few years of your ALUS wetland project, in terms of objectives and maintenance tasks each year. Remember that your ALUS Program Coordinator is available to assist as needed.

YEAR ZERO

What to Expect

- Site preparation is minimal for dug-out, ephemeral and impoundment wetland projects. Wet meadows may require more extensive site preparation.
- There should be clear access for machinery to your wetland site, and an area for the excavated earth (known as spoil piles) to be placed.
- Wetlands are vulnerable to invasive species, so ongoing monitoring is very important from day one.

Objectives

- Ensure clear access to wetland site for machinery.
- Ensure all permits are in place.
- Eliminate unwanted vegetation.
- Plant spoil piles (excavated earth) with native species as soon as possible, to establish a buffer zone.
- Plant wetland species in and around the wetland, if available and appropriate.

Maintenance Tasks

- Monitor for invasive species.
- Monitor for signs of soil erosion, or sediment build-up in the wetland.



YEAR ONE

What to Expect

- The wetland project will hold water (seasonally only, for ephemeral wetlands).
- Native vegetation will grow in the buffer surrounding the wetland– there may also be annual weeds present.
- Increased wildlife, such as birds, insects, reptiles and amphibians.

Objectives

- Ensure the integrity of the berms by visually inspecting for holes, cracks and signs of soil loss.
- Establish vegetation along all erosion-prone areas, such as the side slopes and control structures. Consult your local ALUS Program Coordinator to select the best species mix for your site.

Maintenance Tasks

- Inspect berms on a regular basis for signs of damage, erosion or slumping and report these to your ALUS Program Coordinator.
- Monitor the wetland for invasive species. For tips, see the “Eliminating Unwanted Plants” section of this Guide.



YEAR TWO

What to Expect

- Native vegetation such as cattails will emerge from the seedbank.
- A variety of native birds, insects and mammals using the wetland as habitat.

Objectives

- Continue monitoring for invasive species.
- Continue monitoring for damage to berms.

Maintenance Tasks

- Perform general maintenance in the wetland buffer zone, which may include mowing or removing non-native plants depending on the type of buffer you have established.
- Continue to inspect berms and monitor for invasive species on a regular basis.
- Otherwise, simply enjoy your wetland!



YEAR THREE

What to Expect

- By year three, a properly established wetland project is a beautiful landscape of both aquatic and terrestrial habitat.

Objectives

- Your wetland will be a hive of activity, sustaining a wide variety of birds and wildlife and producing valuable ecosystem services that benefit your community.

Maintenance Tasks

- Wetland ALUS projects are low-maintenance once established, but some management techniques are recommended. See the “Wetland Project Maintenance” section in this Guidebook.



Preparing the Site for Wetland Projects

There are two components to a wetland project:

1. The Waterbody

Planning for the waterbody component of a wetland varies depending on the type of wetland being established: excavated wetlands, ephemeral wetlands and wet meadows may not require extensive planning, while projects with berms will require proper permitting and engineering reports to ensure they are structurally sound. Your ALUS Program Coordinator should work with the local regulatory authorities to ensure correct permits are in place.

Overview of Site-Preparation Options

There are several options for preparing your wetland project site. Wetlands are vulnerable to invasive species; non-native vegetation should be controlled as described below. Eradicating invasive species prior to establishing



Creation of dug-out wetlands requires excavation equipment.

Chemical Spray Application (for dry sites only)

It is important to eliminate unwanted vegetation while preparing a site for a future wetland project. However, **chemical control sprays are NOT permitted for use around water in Canada (at press time in 2021).** Chemical control sprays may be used on dry sites only.

Use a glyphosate-based herbicide at the recommended rates to kill unwanted vegetation on the entire site.

For sites with some native species you do not want to remove, perform a spot treatment on undesirable plants using a backpack sprayer.

Repeat this process with as many applications as needed.

Mowing (for wet sites)

Currently [at press time in 2019] in Canada, no chemical control sprays are permitted for use around water. For wet sites, mowing is the recommended technique for eliminating unwanted vegetation.

Mow the existing vegetation on your site using a flail

2. The Wetland Buffer

Every wetland project should have a vegetative buffer surrounding it to ensure the wetland functions properly for wildlife habitat and water filtration. For dug-out wetlands, the buffer zone is generally created by distributing the excavated earth around the wetland in spoil piles and then planting native vegetation. The type of vegetation will vary depending on preferences and site conditions. The ALUS guidebook series has more information on how to prepare your buffer area appropriately.

the project will help ensure a successful and functioning wetland, as controlling invasive species becomes harder once a wetland feature is established.



Heavy machinery creating an impoundment wetland.

mower at the highest setting to cut off the weeds' seed-heads while leaving tall stems for as much soil coverage as possible.

Mow prior to weed seed-set to help reduce the seed bank.

Mow in the early fall if you are targeting woody stems.

Repeated mowing is effective at weakening the root system over time in areas where there are large amounts of invasive plants or woody stems.

Excavation Equipment

It is important to discuss equipment needs with the contractor preparing your wetland project site.

Areas that are quick to inundate with water require excavation equipment, while wet-meadow construction can usually be completed with a bulldozer.

Ensure the contractor can access the site with the needed equipment. If tree limbs or fences are in the way, removal may be necessary.

What Site-Preparation Method is Right for Me?



Site preparation and project planning are critical for establishing wetland projects. When done correctly, proper preparation will save you time, energy and frustration in the years to come. The work required to prepare the site varies depending on the type of wetland project you are establishing and the current state of the site.

Every site is unique, and its preparation plan will need to be tailored to your conditions. The following guidelines apply to a typical site.

WETLAND TYPE	Dug-Out Wetlands, Ephemeral Wetlands	Impoundment Wetlands	Wet Meadows
RECOMMENDED METHOD	<ul style="list-style-type: none"> Proper permits in place Ensure clear access to site Ensure adequate space for spoils (excavated earth) Eradicate invasive species 	<ul style="list-style-type: none"> Engineering reports for berm are complete Proper permits in place Ensure clear access to site Eradicate invasive species 	<ul style="list-style-type: none"> Preparation is similar to ALUS grassland project preparation Control unwanted vegetation mechanically or chemically, as per our guidelines.
COMMENTS	Dug-out wetlands typically do not require much site preparation.	Proper engineering is required to ensure berms will not become damaged or wash away.	<ul style="list-style-type: none"> See ALUS' "Success with ALUS Grassland Projects" for more detailed information. Wet sites may require more mechanical preparation due to restrictions on chemical use.

Wetland Project Maintenance

ALUS wetland projects are low-maintenance once established but are vulnerable to invasive species, so monitoring is an important part of maintaining your project. The following maintenance techniques will help ensure quality wetland habitat for years to come.

Please check with your ALUS Program Coordinator to ensure you are using the most appropriate maintenance method, at the right time, for your site's unique conditions.

Wetland Maintenance Techniques

Some regular maintenance is required to maintain the health and function of your ALUS wetland project and to control non-native, invasive species.



A small stand of European Common Reed (*Phragmites australis*) starting to grow at a wetland project site.



Berm Maintenance

Why: Inspecting your berm is an important part of maintaining your ALUS wetland project. Wetland berms may be susceptible to erosion or damage from animals such as muskrats. Damaged berms can result in flooding or property damage downstream.

When: As a general guideline, you should inspect your wetland project four times a year (seasonally).

How: Look for evidence of erosion (small channels in the soil, areas where vegetation has not established, sedimentation at the waterline), and evidence of animal damage (holes or dens in the berm). If you see any damage, contact your local ALUS Program Coordinator to arrange for immediate repair.



Buffer Maintenance

Why: The buffer area around the waterbody may become infested with unwanted vegetation that will compete with the desired native plant species.

How: See ALUS' "Reforestation Guide" or "Grassland Guide" for maintenance techniques applicable to your wetland buffer. See next page for detailed recommendations.

Managing Invasive Species



Controlling invasive species in and around wetland projects is critical to their function. While common annual weeds may be present, it is important to monitor your wetland on an ongoing basis for more aggressive invasive species.

Some species are commonly known to encroach on wetland projects in ALUS' Eastern Hub. Look out for European Common Reed (*Phragmites australis*), Purple Loosestrife (*Lythrum salicaria*), Reed Canary Grass (*Phalaris arundinacea*), and various thistles (Sow Thistle, Canada Thistle, Bull Thistle).

For information on managing invasive species, please refer to the resources from the Ontario Invading Species Awareness Program and Ontario Invasive Plant Council listed in the "Additional Resources" section of this Guidebook.

Maintenance Challenges

CHALLENGE	OPTIONS
I see soil erosion or holes in my berm	Contact your ALUS Program Coordinator as soon as possible
I have spotted Phragmites growing in or around my wetland	Chemical or manual control depending on site conditions. Contact your ALUS Program Coordinator for direction. Refer to eliminating unwanted plants section of this guide.
My wetland is full of cattails	Cattail is a native plant that supports native wildlife. You can manually thin the cattails by cutting them if you wish.
The buffer area is covered in weeds	Consult the ALUS Guidebook relevant to your type of buffer, for the appropriate maintenance techniques.
I do not have the equipment, chemicals or licenses required to do the maintenance and/or site preparation work	Contact your ALUS Program Coordinator. They can help connect you with individuals and businesses who provide these services.

Eliminating Unwanted Plants from Wetland Projects

Non-native plants are undesirable species in ALUS wetland projects. Regular monitoring and maintenance is critical. There are several methods commonly used to eliminate these unwanted plants, but note that mowing and other forms of mechanical maintenance is recommended, due to Canada's restrictions on chemical herbicide use near water. If using chemicals near your wetland, be mindful of where and how you are using them and follow all appropriate regulations.



Option 1: Mechanical Controls

Why: In wet areas where chemical treatments are prohibited, mechanical control is the only option.

When: Any time of year.

How: Mowing before the weeds set their seeds can gradually decrease the presence of weeds. Spading is a technique where a shovel is used to break the roots and manually pull out unwanted plants. You can also trim or cut unwanted plants with various hand tools or trimmers.

Option 2: Chemical Spray Application

Why: Chemical sprays can be applied to large buffer sites in poor condition that are overrun with unwanted or invasive weeds. Do not use this method on sites with native herbaceous flowering plants (forbs). Only apply chemical controls a safe distance from water, as per Canadian regulations.

When: Spray in early spring while native species are still dormant.

How: Contact your local Program Coordinator for advice on which herbicides are appropriate for your site. Protect young trees from the chemical.

Option 3: Chemical Spot Treatment

Why: Spot treatment can be used to control individual weeds or small areas of invasive plants.

When: Spray before the unwanted plant develops its seed-head. For European Common Reed (*Phragmites australis*), spray in late summer or early fall once the seed-head has developed.

How: Spray unwanted plants using a backpack sprayer with a glyphosate-based herbicide. Be cautious on sites with forbs and be aware of your proximity to the waterbody. When close to water, hand wicking may be more appropriate (see below).

Option 4: Daubing or Hand-Wicking

Why: This method is used to control aggressive invasive plants growing near a waterbody, such as European Common Reed (*Phragmites australis*).

When: Most effective in late summer and early fall, when the plant is actively moving nutrients towards its roots, but daubing can be done anytime during the growing season: from first plant growth in spring until late fall before the frost.

How: Apply the herbicide mixture directly to the stalk of the plant by daubing with an applicator, or by running a gloved hand dipped in herbicide along the stalk. See "Additional Resources," below, for more detailed instructions.

Additional Resources



An ALUS Program Coordinator works with a landowner and a contractor during the establishment of a dug-out wetland project.

ALUS encourages ALUS communities and participants to work closely with other knowledge-able agencies in their area. The following groups have created good resources providing information on a number of topics

that, when used in combination with this ALUS guide, will help you establish and maintain a successful wetland project.

Ontario Ministry of Natural Resources and Forestry

For information on a variety of topics including invasive species management, ALUS recommends this helpful document: "Invasive Phragmites – Best Management Practices"

Tel: 1-800-667-1940

Website: Ontario.ca

Ontario Invasive Plant Council

ALUS recommends the Ontario Invasive Plant Council as a source of information about invasive plant species and best management practices.

Tel: 705-741-5400

Website: OntarioInvasivePlants.ca

Ontario Invading Species Awareness Program

Another great source of information on invasive species.

Tel: 1-800-563-7711

Website: InvadingSpecies.com

About this Guide

This booklet is part of the ALUS Guidebook series, illustrating the types of ALUS projects available to participating farmers and ranchers.

The ALUS program provides planning advice and technical expertise for the design and implementation of each project through its local ALUS Partnership Advisory Committees. ALUS participants receive an annual, per-acre payment to manage and maintain their ALUS projects over the duration of their contract. During this time, ALUS projects are independently monitored, verified and audited to ensure they are producing ecosystem services for the community.

For more information, please contact your closest ALUS Program Coordinator.

See ALUS.ca for contact details.

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ALUS is a national program helping farmers and ranchers produce cleaner air, cleaner water, more biodiversity and other ecosystem services in their communities. Specifically, ALUS helps farmers and ranchers enhance wetlands,

plant windbreaks, improve riparian buffer zones, create habitat for pollinators and other wildlife, and establish other types of projects to produce ecosystem services. For more information, please visit ALUS.ca

ALUS.ca

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