

Prevention and Response Plan for European Water Chestnut (*Trapa natans*) in Ontario

**A plan to set out practices to manage European water chestnut,
including to authorize certain persons to undertake specified control
and eradication activities, under the *Invasive Species Act, 2015***

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Ontario Ministry of Natural Resources and Forestry**

Table of Contents

Purpose and Rationale	2
Background	2
Legislative Context	4
Scope of the Plan	5
Authorized Persons	5
Authorized Activities	6
Conditions	6
Best Management Practices for Control of European Water Chestnut	7
Hand Pulling or the Use of Human-powered Hand-Held Devices	9
Mechanical Control	9
Aquatic Herbicides****	10
Updates to or Cancellation of the Prevention and Response Plan	10
Other Considerations	11
Aquatic Plant Removal in Provincial Crown Land and Shore Lands	11
Herbicides	11
Aquatic Plant Removal in Federal Lands and Waters	11
Resources to Support the Implementation of the Plan	12

This Prevention and Response Plan is prepared under subsection 13(1) of the [Invasive Species Act, 2015](#).

Purpose and Rationale

European water chestnut (*Trapa natans*) is classified as a prohibited invasive species as laid out in [Ontario Regulation 354/16](#) made under the [Invasive Species Act, 2015](#), and the prohibitions set out in section 7 of the Act apply to European water chestnut. These prohibited activities include bringing a member of the species into Ontario, as well as depositing, releasing, possessing, transporting, propagating, and buying/selling/leasing/trading members of the species.

This prevention and response plan for European water chestnut authorizes certain activities otherwise prohibited by the Act. Individuals acting in accordance with this plan when carrying out activities to monitor, manage, control or eradicate European water chestnut in Ontario, and to prevent its further spread are not required to obtain additional individual authorizations under the Act.

This prevention and response plan identifies the persons or groups of persons who are authorized to implement the plan, sets out the types of activities that the plan applies to and describes conditions that these persons must follow to lawfully possess, transport, and deposit European water chestnut in Ontario.

Background

European water chestnut is an invasive annual aquatic plant that is native to warm-temperate regions of Eurasia and Africa. It looks different than any other plant species in the wild in Ontario. It forms floating rosettes, with glossy green floating leaves, that are fan-shaped and have sharply toothed edges (Figure 1). European water chestnut typically grows in calm, shallow waters (2 metres or less) but can grow in depths of up to 5 metres.



Figure 1: Rosette of a European water chestnut plant (Photo credit: F. MacDonald)

European water chestnut forms dense mats of floating and submerged vegetation that aggressively outcompete native plants, and can impede activities such as boating, swimming and angling (Figure 2). In addition, its hard nuts (seeds) with sharp, barbed spines can wash up on shore and cause injury when stepped upon. It can also interfere with infrastructure, including water intakes, navigation canals and locks, and hydroelectric facilities where periodic removal of entrained European water chestnut plants or plant parts may be required as part of ongoing facility maintenance.

European water chestnut has the potential to invade lake and river ecosystems throughout Ontario and the Great Lakes basin ecosystem. This could cause significant harm to biodiversity, and affect recreation, tourism and navigation in aquatic systems.



Figure 2: European water chestnut infestation at Voyageur Provincial Park in 2009 (Photo credit: F. MacDonald)

European water chestnut was first reported in Ontario in 2005, in a section of the Ottawa River within Voyageur Provincial Park. More recently, it has been found in the Rideau River upstream of Black's Rapids, the Greater Cataraqui River in Kingston, and Lake Ontario at Wolfe Island and Oshawa. The likely source of European water chestnut introductions to Ontario is either improper release of water garden plants (where they were used as ornamental plants) or as a result of the transport of boats contaminated with European water chestnut from infested areas outside of Ontario.

The regulation of European water chestnut in 2016 under the [Invasive Species Act, 2015](#) has helped to address these key pathways for its introduction. For example, it is now illegal to propagate European water chestnut and to possess or transport it.

The Ministry of Natural Resources and Forestry (MNRF), Ministry of the Environment, Conservation and Parks, and partners have been monitoring European water chestnut and undertaking measures to control populations and prevent spread to new locations.

Many groups and individuals also play an important role in monitoring, controlling and preventing the further introduction and spread of this invasive species in Ontario waters. These include First Nation and Métis communities and organizations, municipalities, volunteer groups, shoreline residents and members of the public. Similarly, operators and staff of infrastructure facilities in areas of European water chestnut infestations can also prevent spread by taking precautionary measures to avoid incidental dispersal or downstream transport of European water chestnut plants or plant parts during operation or facility maintenance.

All sightings of European water chestnut in new locations should be reported to the Invading Species Hotline at 1-800-563-7711, or www.eddmaps.org/ontario.

Legislative Context

Under the *Invasive Species Act, 2015*, the Minister may cause a prevention and response plan to be prepared with respect to an invasive species. A prevention and response plan may include measures, practices or courses of action to deal with invasive species and may authorize persons identified in the plan to carry out activities to assist in the implementation of the plan.

Pursuant to subsection 13(4) of the Act, this prevention and response plan authorizes the persons identified in this plan to carry out the measures and practices set out under this plan. Under subsection 9(3) of the Act, the persons identified in this plan will be permitted to possess, transport, deposit and release European water chestnut in the course of implementing the activities specified in this plan and in accordance with the conditions and provisions of this plan.

Note: As of the date of preparation of this plan, there is also an exemption in [Ontario Regulation 354/16](#) for the incidental possession and transport of European water chestnut plants that attach to a boat as a result of operating it in infested waters. This exemption is subject to conditions including incidental possession or transport of European water chestnut solely as a result of the operation of the boat, taking reasonable precautions to avoid moving plants to other areas of the water body, removal of European water chestnut from the boat before transporting the boat overland and disposal of European water chestnut away from any water body. Please refer to the regulation for the complete requirements and for any updates. This plan does not affect activities taken pursuant to the exemption set out in the regulation.

If you are considering activities related to European water chestnut that are not within the scope of this plan, authorization under the *Invasive Species Act, 2015* will be needed if the activity involves actions that are otherwise prohibited under the Act (e.g. possession or transport of this plant). For information about obtaining an authorization under the Act, such as for research or education, contact the Ministry of Natural Resources and Forestry's Natural Resources Information and Support Centre at 1-800-667-1940, or visit the [website](http://www.ontario.ca/page/ministry-natural-resources-and-forestry) at www.ontario.ca/page/ministry-natural-resources-and-forestry.

Note: Control of aquatic vegetation, including European water chestnut, may require permits, approval or authorizations from other agencies and/or levels of government. The “Other Considerations” section of this Plan provides some examples of other authorities that may be relevant.

Scope of the Plan

This prevention and response plan:

- (a) applies only to European water chestnut (*Trapa natans*); and
- (b) applies to all areas in Ontario where the species is present.

For greater certainty, any reference to European water chestnut in this plan includes any part of European water chestnut, including leaves, stems, flowers and seeds.

Authorized Persons

The following persons are authorized to carry out the following measures and practices to help control, eradicate and prevent the spread of European water chestnut in Ontario:

- 1) The following entities, and any individuals, including volunteers, acting under the supervision or control of any of the following entities, engaged in prevention, monitoring, control or removal of European water chestnut:
 - (a) a band, a tribal council, or an organization that represents a territorially based aboriginal community;
 - (b) a not-for-profit corporation;
 - (c) a municipality; or,
 - (d) a conservation authority
- 2) Waterfront property owners engaged in the control and removal of European water chestnut, if the waterfront property is a parcel of property that;
 - (a) has a boundary on a lake, river, stream or pond, where the control and removal of European water chestnut is to be carried out, or
 - (b) is separated from a lake, river, stream or pond where the control and removal of European water chestnut is to be carried out only by,
 - (i) a road allowance, or
 - (ii) a strip of public lands that is not more than 30 metres in perpendicular width from the lake, river, stream or pond.
- 3) Property owners engaged in control and removal of European water chestnut from a pond or water garden that lies wholly within the boundaries of their property.

4) Owners and operators of hydroelectric facilities or other in-water structures engaged in activities to control or manage European water chestnut as part of the facility maintenance or construction activities.

5) Agents or employees acting on behalf of an entity or person identified in (1) - (4) above.

Authorized Activities

For the purpose of carrying out the measures and practices set out above, and if all the conditions set out in this plan are met, Authorized Persons are permitted to undertake the following activities:

(a) Possession and transportation of European water chestnut in the course of prevention, monitoring, control, and removal of European water chestnut and for the purpose of disposal or destruction of European water chestnut.

(b) Deposit of European water chestnut away from any body of water as required to dispose of plants or plant parts that were removed from a body of water.

Conditions

The following conditions apply to all persons carrying out activities authorized under this prevention and response plan:

1. No person acting under the authority of this prevention and response plan shall remove European water chestnut by means other than by hand pulling or human-powered hand-held devices (e.g. rake). For greater clarity, this plan does not apply to the use of other physical removal activities such as mechanical harvesters, dredging or diver-assisted or boat-based suction harvesting. Persons seeking to remove European water chestnut through other physical removal activities must obtain a separate authorization under the ISA.

2. Reasonable precautions must be taken to ensure that European water chestnut is not deposited downstream or outside of the control or removal area during the course of prevention, monitoring, control, or removal activities, in-water structure or facility maintenance, or construction activities.

3. All equipment and/or watercraft used in infested waters during European water chestnut prevention, monitoring, control or removal activities must be inspected and cleaned of any European water chestnut prior to movement overland.

4. If transported overland for disposal, any European water chestnut must be contained or secured in a manner that ensures that no plants or plant parts are lost during transport.

5. European water chestnut that is removed from the water must be disposed of on dry land in a manner that ensures that no part of the plant will re-enter the body of water or enter into any other body of water.

6. Entities listed under paragraph (1) and persons listed under paragraphs (2) - (4) under the heading “Authorized Persons” shall notify the Ministry prior to initiating activities to prevent, monitor, control or remove European water chestnut. Notification shall be made by email to invasive.species@ontario.ca, providing the location, approximate size of European water chestnut population, and the approximate time and duration of the activities. This information will assist the Ministry to document new locations and assess the status of prevention and control efforts for this invasive plant in the province.

Best Management Practices for Control of European Water Chestnut

The following information provides a summary of control techniques for European water chestnut. It is provided for information purposes only and does not provide legal authority to engage in activities that may otherwise require authorization under other applicable laws.

Consult with Ontario’s [In-water Work Timing Window Guidelines](#) prior to carrying out work in water. These Guidelines restrict in-water work during certain periods to protect fish during spawning migrations and other critical life stages.

TIPS FOR CONTROLLING EUROPEAN WATER CHESTNUT

1) Prevent seed production

- European water chestnut reproduces solely by seed (July to September).
- Stop seed production before seeds begin to drop in mid-August.

2) Start early and maintain effort

- Follow [Ontario's In-Water Work Timing Window Guidelines](#).
- Begin control early in the season to stop new plants from developing seeds.
- Maintain control over several years to address remnant seeds in the sediment (can be viable for up to 12 + years).

3) Prevent spread during control

- Water current, wave and wind action can dislodge plants and seeds and carry them to new areas.
- Take precautions to prevent the release of plants downstream during control. Dependent on the location, the use of temporary floating barriers may assist with preventing dispersal.

4) Clean equipment and watercraft

- All equipment and or watercraft used in infested waters during control must be inspected and cleaned prior to movement overland. [Guidance on best practices for cleaning watercraft can be found online](#).

5) Dispose of European water chestnut carefully

- Dispose of European water chestnut on dry land, ensuring that no part of the plant will re-enter the body of water or into any other body of water.
- If transporting European water chestnut for disposal, it must be secured to ensure that no plants or plant parts are lost during transport.

6) Beware of the seeds

- The seeds have sharp spines that can cut the skin. Use proper safety gear (e.g., gloves) when handling.

Hand Pulling or the Use of Human-powered Hand-Held Devices

Individual plants and small populations of European water chestnut can be controlled by pulling by hand or with the use of human-powered hand-held devices (e.g. garden rake). This can be performed by wading or from canoes, kayaks, and small boats. When pulling a European water chestnut plant, reach down as far as possible to get the whole stem and root. This will prevent the development of small rosettes that are growing on the same plant but have not yet reached the water's surface. Gloves should always be worn when handling European water chestnut to prevent injury from the sharp seeds/nutlets.

Removal should occur early* in the growing season because it is easier to pull plants and roots while they are small. As the plant matures seeds may begin to drop from the plants. Plants with mature seeds (nutlets) should be pulled gently and flipped upside down while retrieving them, to prevent nutlets from falling into the water. It will be necessary to return to the site several times during the growing season to address regrowth or new plants.

***Note:** If work is planned to occur when in-water work is restricted as per Ontario's [In-water Work Timing Guidelines](#), you must contact either the [Ministry of Natural Resources and Forestry district office](#) or federal agency (Parks Canada Agency or Fisheries and Oceans Canada) depending on the agency responsible for management of the waters at your site to apply for an authorization.

Mechanical Control

Larger infestations can be effectively controlled using mechanical devices** that cut the rosettes from the stem of the plant or pull the plant and its roots from the water.

Some harvesting equipment can cut and transport simultaneously; however, these activities can be conducted separately. For example, European water chestnut at Voyageur Provincial Park on the Ottawa River is controlled with two modified boats, one to cut flowering/fruitlet rosettes of the plants, and the other to collect and transport them for disposal.

****Note:** Persons seeking to remove European water chestnut through mechanical devices such as mechanical harvesters must obtain a separate authorization under the [Invasive Species Act, 2015](#).

Mechanical controls must be repeated several times per growing season*** to ensure no new seeds are produced on plants that regrow. Shallow waters, or areas with many obstacles such as stumps can impede control operations.

***** Note:** If work is planned to occur when in-water work is restricted as per Ontario's [In-water Work Timing Guidelines](#), you must contact either the Ministry of Natural Resources and Forestry or the federal agency (Parks Canada Agency or Fisheries and Oceans Canada) responsible for management of the waters at your site to apply for an authorization.

Precautionary measures are also necessary to contain and collect all plant parts to prevent spread within the waterbody. Floating artificial barriers may assist with containing cut plants until they can be collected.

Mechanical controls have been used in several large-scale water chestnut control programs in Canada and the United States including those in Voyageur Provincial Park. These programs have had success in reducing the density of plants, some effectively eradicating, particularly after several consecutive years of control.

Aquatic Herbicides****

Within Canada, diquat (trade name Reward® Aquatic Herbicide) is the only herbicide currently registered by Health Canada's Pest Management Regulatory Agency (PMRA) for control of European water chestnut in aquatic systems. Consult PMRA's Pesticide Label Search [online](#) for more information about pesticide products that are registered for use in Canada.

Diquat can provide control of large dense infestations of European water chestnut particularly in areas with obstacles that prevent access by mechanical harvesters. However, because it is a non-selective contact herbicide, its use should be targeted to large dense infestations of European water chestnut to reduce impacts to non-target plants. To be most effective, it should be applied early to mid-summer when European water chestnut is actively growing and before seed production. Follow up treatments within the season may be necessary to address regrowth and to prevent seed production.

The efficacy of diquat can be affected by temperature, turbidity, water flow and depth. Follow the product label for directions on application rate and limitations of use. Additional control efforts within season, and in subsequent years may be necessary to address any regrowth and plants that were missed during initial application.

******Note:** If you plan to use herbicides to control European water chestnut or other aquatic plants, approval is required from the Ontario Ministry of the Environment, Conservation and Parks (MECP). Information on requirements for aquatic herbicide applications can be obtained by contacting a MECP [regional office](#) to discuss plans and what pesticide permits may be required.

Updates to or Cancellation of the Prevention and Response Plan

Under the *Invasive Species Act, 2015*, the Minister may cause a prevention and response plan to be updated from time to time as the Minister considers appropriate. The Minister will publish and give notice of any updates to the prevention and response plan as appropriate.

The Minister may also cancel a prevention and response plan by publishing notice of the cancellation on a website maintained by the Government of Ontario and by giving notice of the cancellation of the plan in any other manner that the Minister considers appropriate.

Other Considerations

Permits, approvals or authorizations may be required from other agencies and/or levels of government before an activity related to the control or removal of European water chestnut can be initiated. It is the responsibility of the individual to ensure that all other permissions, approvals and authorizations are acquired prior to proceeding with any European water chestnut control or removal activities. For example, the presence of a species at risk may require additional authorizations.

Other permits, approvals and authorizations that could apply to European water chestnut control activities will depend on the location in Ontario, as well as the timing and type of activity being undertaken. While not an exhaustive list of permits or rules that may apply to European water chestnut control or removal activities, several examples for consideration include the following:

Aquatic Plant Removal in Provincial Crown Land and Shore Lands

In Ontario, the beds of most waterbodies are provincial Crown land. The Ministry of Natural Resources and Forestry manages Crown and shore lands under the [Public Lands Act](#) (PLA). The PLA does not apply to federal lands and water bodies (e.g., the Trent-Severn and Rideau Canal waterways), or provincial parks and conservation reserves.

The PLA applies to the removal of invasive aquatic vegetation from provincial Crown land and shore lands. [The rules](#) in [Ontario Regulation 239/13](#), section 9 must be met, in addition to the direction prescribed in this European Water Chestnut Prevention and Response Plan.

If you cannot meet all the prescribed rules, for example, if you want to conduct control or removal activities outside of the [in-water work timing window guidelines](#), you will need a work permit. Information on how and when you need a work permit for projects on Crown land and shore lands as well as permit applications can be obtained [online](#) at or by contacting your local [MNRF office](#).

Please also refer to e-laws regularly, to check for any updates to the requirements under the [Public Lands Act](#).

Herbicides

If you plan to use herbicides to control European water chestnut or other aquatic plants, approval is required from the Ontario Ministry of the Environment, Conservation and Parks (MECP). Information on requirements for aquatic herbicide applications can be obtained by contacting a MECP [regional office](#) to discuss plans and determine what pesticide permits may be required.

Aquatic Plant Removal in Federal Lands and Waters

Authorization is required from the Parks Canada Agency for any plant removal activity in federal waters under their jurisdiction including national parks and historic sites. For the Trent-Severn Waterway and the Rideau Canal, permit applications and guidelines for aquatic plant removal can be obtained on-line. Depending on the scope of the project, obtaining a permit for control work might involve one of two pathways. For residential or smaller projects, please see policies for [In-water and Shoreline Works and](#)

[Related Activities](#), or for larger projects please see policies under the [Research and Collection Permit System](#).

Federal waters that are not regulated by the Parks Canada Agency are generally under the authority of Fisheries and Oceans Canada (e.g. small craft harbours). Information about requirements related to projects for the prevention, control or eradication of an aquatic invasive species near water can be obtained [online](#).

Resources to Support the Implementation of the Plan

For more information about the [Invasive Species Act, 2015](#) and [regulations](#) pertaining to European water chestnut and other regulated invasive species visit <https://www.ontario.ca/page/invasive-species-ontario>.

For more information about how to identify European water chestnut, report new occurrences, and prevent its further spread in Ontario visit <https://www.ontario.ca/page/water-chestnut>.