



# Guide to best practices



in aquatic environments  
to prevent the  
introduction and  
propagation of aquatic  
invasive species



Ministère des Forêts, de la Faune et des Parcs  
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## **WARNING**

This guide has been designed for use as a reference. It is not a regulatory document and must not be cited as an authoritative source. The aquatic invasive species named in this guide do not constitute an exhaustive list of the species present in Québec or close to its borders.

## **DISTRIBUTION AND USE OF THIS GUIDE**

This guide is made available for on-line consultation and for downloading. Updates are planned to include new information, research and development results, and new prevention and decontamination methods. Each of the information sheets presented in the appendix is available separately in digital format for specific activities and client groups.

## **Legal deposit**

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This guide contains recommendations and guidelines for the inspection and cleaning of watercraft, trailers and equipment used in aquatic environments, to prevent the introduction and propagation of aquatic invasive species (AIS). The activities covered include sport fishing, nautical activities and pleasure boating, and inventories or sampling carried out in aquatic environments.

The first section of the guide provides an overview of AIS and highlights the importance of preventing their propagation. The following sections deal with the inspection and cleaning of watercraft, trailers and equipment used in aquatic environments, and makes recommendations concerning the construction of a fixed cleaning station. The information sheets focus on specific inspection and cleaning activities for various activities conducted in an aquatic environment:

- Sport fishing activities without a watercraft;
- Sport fishing activities with a watercraft;
- Nautical activities with a watercraft;
- Diving and snorkelling;
- Waterfowl hunting with or without a watercraft;
- Floatplane use.

AIS propagation from one body of water to another may be accelerated by the use of contaminated watercraft and equipment if decontamination measures are not applied. AIS may be hidden in various unsuspected places on the watercraft or equipment. For example, small organisms, plant debris, fish and crustacean eggs and larvae, and even pathogens can remain attached to the hull of watercraft or various parts of a trailer, or be carried in the water contained in a live well or tank. Once an AIS has been introduced and becomes established in an ecosystem, it is difficult and even impossible to eradicate it. The cost of controlling or eradicating a species, when this is possible, is high and ongoing. Preventing the introduction and propagation of AIS is not only the first step in the fight against them, but also the most effective and least costly method that can be applied. A simple inspection of watercraft and equipment, the removal of any debris and organisms found, and the emptying of pooled water, can reduce the risk of introducing and propagating AIS by up to 85%. If this is followed by an effective cleaning operation, the risk of propagating AIS through fishing and nautical activities is reduced even further.

These best practices are consistent with the preventive actions generally applied in the fight against AIS. Preventing the introduction and propagation of AIS is essential to ensure the health of aquatic ecosystems, the long-term viability of resources and the socio-economic activities they support, and the conservation and preservation of biodiversity among the species they contain. In addition, these best practices will allow current users of all kinds, and future generations, to continue to benefit from this natural heritage.



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# 1 INTRODUCTION

This guide is intended to promote and establish best practices, to prevent the introduction and propagation of AIS in aquatic ecosystems in Québec as the result of various activities. For example, fishing, pleasure boating and several other nautical activities are recognized as potential vectors for AIS introduction and propagation. The guide contains general information about AIS, information about the importance of complying with directives to prevent AIS introduction and propagation, and recommendations on ways to correctly complete the steps in the inspection and cleaning of the watercraft, trailers and equipment used for various activities. The cleaning of watercraft and equipment is a proven, effective way to control AIS. By applying these best practices, people who use bodies of water for various reasons will be able to continue to enjoy their favourite activities while reducing the risk of introducing and propagating AIS in other aquatic habitats.

This guide to best practices can also be used to draft protocols for the activities involved in gathering data, managing animal populations, and characterizing ecosystems. The protocols can then be applied by all workers, including consultants and employees of government departments, municipalities, non-profit organizations, etc.

## 1.1 Aquatic invasive species and their main vectors

An aquatic invasive species (AIS) is a plant, animal or micro-organism (virus or bacterium) introduced outside its natural range, whose establishment or propagation poses a threat for the environment, the economy or society.

An AIS may be introduced by a natural vector, such as a water current or hydrographic link between two bodies of water, or through the actions of an animal species, such as a bird. Introduction may also result from a human vector, in other words a human activity such as water-based transportation, sport fishing, commercial fishery, or voluntary release of aquatic organisms into the natural environment. Although natural vectors have always been, and will always be, behind some AIS introduction and propagation, they normally act at a local level, over small distances and can mostly be monitored. Human vectors, on the other hand, support more widespread introduction, at a far higher pace, and lead to introduction in areas with no natural connectivity. Human vectors are mostly unpredictable; identifying and monitoring them is a major challenge.

In Québec, and in several other regions around the world, AIS introduction has been greatly facilitated by globalization, the expansion of foreign trade, and the ease of international travel. Although a species may be introduced outside its native range following a one-off natural event (such as a flood or storm), most introductions are connected with human activities. They may be deliberate, for example when organisms are used for bio-control purposes, or when a pet, or an animal that has been hunted or fished, is released into a natural environment with or without authorization. Accidental introduction is also possible, for example when an animal escapes from a farm or animal-raising facility, or when a species is transported on a ship, in the water contained in the live well of a watercraft, or attached to a range of structures, equipment and materials moved from one body of water to another.

## 1.2 Why are AIS such a problem?

AIS can have many different impacts on ecosystems and society. Since several AIS can stay undetected with the naked eye, they can easily be moved to a new body of water. Similarly, it is sometimes hard to tell the difference between an AIS and a native species, meaning that their presence may not be reported immediately. The sooner an AIS is reported, the greater the chances that rapid intervention will be successful and that the AIS will be eradicated. On the other hand, the more the time that elapses between the introduction and the reporting of the species, the greater the chances that the population will become established in the host community. Certain environmental parameters must be met if individuals are to survive and become established, such as the presence of partners, a suitable temperature for survival, etc.



In many regions of the world, AIS have had a significant impact from an ecological, economic and social points of view. The Convention on Biological Diversity considers AIS to be the second greatest worldwide threat to biodiversity, after habitat destruction. Once an AIS population has become established in an ecosystem, it is difficult, if not impossible to eradicate it, and controlling it entails a significant and recurrent expense. This is why prevention, early detection and rapid intervention are key measures in the fight against AIS.

AIS may

- **Limit fishing and nautical activities:** some AIS may threaten the safety of pleasure boaters and fishers. Zebra mussel shells, for example, may injure swimmers who step on them. Silver carp, one of four species of Asian carp, may jump several metres out of the water and injure the occupants of a watercraft, in addition to damaging the watercraft itself. Several invasive aquatic plants can also have a negative impact on the use of bodies of water. The dense mass of vegetation formed by some AIS may limit navigation and sport fishing. In some places, plant density may even cut off access to a body of water;
- **Compromise the composition and health of populations of native species:** in general an AIS, once established in a new environment, cannot provide a high-quality habitat or source of food for native species. AIS may potentially supplant native species of aquatic flora and fauna; the species that depend on them will then have to move to another habitat, which may not be suitable to ensure their survival. An over-abundance of invasive plant species may affect water quality by limiting the oxygen level needed for the survival of fish and other aquatic organisms;
- **Lead to a loss of animal and plant biodiversity:** the propagation and establishment of AIS leads to changes in the composition of the ecosystem, in particular by reducing native biological diversity. AIS compete with native species for food and space. The introduction and propagation of AIS leads to a loss of balance in the predator/prey relationship and the use of space in the ecosystem. For some populations of native species that cannot move to a new habitat to ensure their survival, depredation, the lack of food and space, or hybridization with the AIS could lead to the disappearance of the original population, resulting in a loss of animal and plant diversity in aquatic ecosystems;
- **Reduce the value of waterside properties and degrade the natural heritage:** the visual attractiveness, recreational value and value of properties located on bodies of water invaded by an AIS will be indirectly impacted by the introduction of the new species. For example, if a body of water is invaded by an AIS to the extent that it prevents nautical activities or alters the quality of the water, the value of waterside properties will drop and users will lose interest in the concerned activity. Over time, they will change their habits and choose bodies of water of higher quality. Visitor numbers in the sector could decline, resulting in a significant impact on economic benefits in the region. Hence, recreation and tourism activities, among others, may suffer collateral damage from the presence of an AIS;
- **Increase management costs:** once an AIS has become established in a new environment, the cost of controlling or managing it may be significant and recurrent, for example to maintain submerged equipment, treat drinking water, control and confine populations of the new species, etc;
- **Reduce water quality:** the presence of an AIS may also reduce water quality by promoting the presence of algae, reducing the quantity of oxygen available, or making water unsuitable for human consumption after widespread die-offs that leave large quantities of decomposing matter in the water.

Limiting the propagation of AIS is already a challenge. As mentioned previously, these species may be introduced by natural or human vectors and, once established in an environment, are difficult or impossible to eradicate. However, it is possible to take action to prevent and limit the introduction and propagation of AIS by various human vectors through best practices such as the cleaning of watercraft, trailers, and other vehicles or equipment used in aquatic environments that may be moved to other bodies of water. The directives set out in this document focus on prevention, the first step in limiting the introduction and propagation of AIS into new environments.

The following table summarizes the main ecological and socio-economic impacts of the introduction and establishment of AIS in an aquatic ecosystem.

**Table 1. Main ecological and socio-economic impacts following the introduction and establishment of an AIS in an aquatic ecosystem**

| <b>Examples of the impact of aquatic invasive species (AIS)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ECOLOGICAL</b>                                               | <ul style="list-style-type: none"> <li>■ Degradation of ecosystems.</li> <li>■ Changes to the structure and composition of communities of aquatic organisms (predation or competition with native species).</li> <li>■ Loss of ecosystem functions of benefit to humans (ecological services).</li> <li>■ Introduction of vectors for parasites and pathogens.</li> <li>■ Erosion and the disturbance of sediments, increasing water turbidity.</li> </ul>                                                                 |
| <b>ECONOMIC</b>                                                 | <ul style="list-style-type: none"> <li>■ Costs associated with AIS: <ul style="list-style-type: none"> <li><u>Worldwide</u><br/><b>Impact:</b> US\$1400 billion, or 5% of worldwide GDP.</li> <li><u>United States</u><br/><b>Impact:</b> US\$137 billion each year.</li> <li><u>Canada</u><br/><b>Impact:</b> US\$5.5 billion each year.</li> </ul> </li> <li>■ Reduction in the value of waterside properties.</li> <li>■ Collapse of sport and commercial fisheries, recreation and tourism activities, etc.</li> </ul> |
| <b>SOCIAL</b>                                                   | <ul style="list-style-type: none"> <li>■ Threat to human health and the health of native species harvested or used by the human population.</li> <li>■ Reduction in water quality.</li> <li>■ Loss of enjoyment, as users can no longer use a body of water for activities or the harvesting of resources.</li> </ul>                                                                                                                                                                                                      |

## 1.3 Why is the cleaning of watercraft recommended?

### 1.3.1 Precautionary principle

To ensure the success of actions to combat AIS, the **precautionary principle** must be applied. Under the precautionary principle, measures must be implemented to prevent risk when scientific and technical knowledge cannot provide certainty, mainly in the fields of environment and health.

When the precautionary principle is applied to the fight against AIS, the body of water used must be considered to be “contaminated”, just as the body of water that the person will visit next must be considered to be free of AIS. By inspecting and cleaning their watercraft, trailer and equipment as a matter of course, users will reduce the risk of contaminating another body of water.

If the watercraft and equipment are used only on one body of water, the risk of AIS introduction and propagation will be low or non-existent. On the other hand, if the watercraft and equipment are used on **several different bodies of water**, the risk of transporting AIS is far greater.

Not all watercraft and equipment present the same risk of propagation. For example, a motor vessel is more likely to transport an AIS than a sailboard, because its tanks and hard-to-access components increase the number of places where fragments of plant matter or living organisms can be lodged. AIS can be carried in the water contained in a live well or in the engine, or can stick to the hull, the anchor rope, etc.

### 1.3.2 AIS adaptability

One of the reasons why AIS become successfully established and are then difficult to eradicate in their new ecosystem is that they are highly adaptive and resilient to adverse and changing environmental conditions. For example, the juvenile stages of some species of mussels can survive in standing water for 24 days at temperatures of 10°C, 8.5 days at temperatures of 15°C, and 4.5 days at temperatures of 30°C. The eggs of the spiny water flea, a small invasive exotic crustacean, can survive in the digestive tract of fish and be excreted, alive, in a different body of water (for example, if they are present in baitfish). These eggs may then remain dormant in the sediment for several months, or even years, until they hatch once conditions become favourable.

Fortunately, there are simple and effective actions that can reduce the risk of introducing and spreading AIS in bodies of water. This includes the inspection and cleaning of watercraft and equipment used in aquatic environments. This guide presents the basic rules that must be followed to effectively inspect and clean watercraft and equipment.

## 2 GENERAL RECOMMENDATIONS

The decontamination of watercraft, trailers and equipment used in aquatic environments is a recognized practice to slow the introduction and spread of AIS from one body of water to another by human vectors.

To do this, it is imperative to follow the four steps of best cleaning practices. The steps are inspection, drainage, cleaning and drying.

In general:

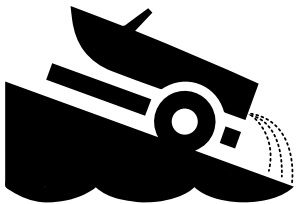
1. All watercraft and equipment must be **inspected**; all living organisms, accumulated plant matter and mud must be removed. Any water contained in the watercraft or in its equipment must be **drained** on site or at a distance from any other body of water or storm sewer system;
2. If a fixed cleaning station equipped with a pressure washer is available for users, it is recommended that you **clean** the watercraft and equipment that has been in contact with water. If this is not possible on site, you should complete the **cleaning** later on and before visiting a new body of water, either at home or at another place where cleaning is possible;
3. In order to enhance the decontamination of watercraft and equipment, a **drying** period of at least 5 days is necessary;
4. You must ensure that the treatment used to decontaminate the watercraft, trailer and equipment is safe, both for the people carrying out the cleaning and for the items being cleaned. For example, you should check to ensure that the equipment being cleaned can withstand pressure and hot water and that measures are in place to prevent injury to the person doing the cleaning;
5. These rules must be applied each time you plan to visit another body of water. This ensures compliance with the precautionary principle, helping to reduce the risk of AIS introduction and dissemination between bodies of water.

## 2.1 Steps in the cleaning process: general guidelines

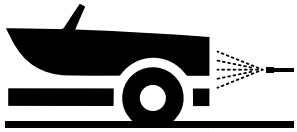
There are four quick, simple and effective steps in the cleaning process.



**INSPECT AND REMOVE:** inspect the watercraft, trailer and equipment and remove any accumulation of plant matter, any visible living organisms and any mud. Pay special attention to any filters attached to various components of the watercraft, such as the engine, that come into contact with the water, since living organisms may be attached. It is important to dispose of all this residue in a safe place, taking care to ensure that it cannot be carried by the wind to another body of water, including a stream, pond, storm sewer inlet, etc.

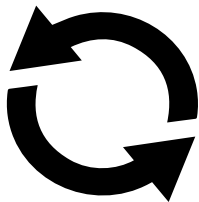


**DRAIN:** drain any water found on board or in any part of the watercraft, including the hold, the bilges, the live wells, the engine, the tanks, etc., and from all containers, compartments and equipment used to hold water or that may have absorbed water, such as coolers, soaked clothing, etc. The water should be drained into the body of water from where it came or into a place from where it cannot drain into another body of water. This point is important, especially if the water is drained at a distance from the original body of water or near another body of water.



**CLEAN AND DRY:** once the inspection is complete, the watercraft, trailer and equipment used in an aquatic environment must be cleaned. The use of a pressure washer (2600 psi pressure) is recommended. Cold water can be used, but hot water at a temperature of 60°C (140°F) will also kill any living organisms dislodged by the pressure washer jet.

If you do not plan to visit another body of water immediately, or if you store your equipment for the rest of the season, the watercraft, trailer and equipment may be left to dry naturally, after ensuring that all water in the watercraft and equipment is removed. For effective drying, it is recommended that it be done over a period of 5 consecutive days at a moisture level of 65% or less. Temperatures below zero during winter storage also promote decontamination. On the other hand, if you plan to visit another body of water in the near future, it is highly recommended that you clean the watercraft and equipment.



**REPEAT:** repeat these four steps each time you plan to visit another body of water.

## 2.2 Details about cleaning with water

### 2.2.1 Cleaning using a pressure washer

Several cleaning techniques can be used. However, cleaning with a pressure washer is highly recommended. The water pressure exerted on the various parts of the watercraft and equipment makes it possible to dislodge living organisms more effectively, and the cleaning operation is quicker than using, for example, a garden hose fed by the municipal water system at a lower pressure.

Even though cold water can be used for cleaning, the use of hot water has the advantage of killing living organisms. The higher the temperature of the water used during pressure cleaning, the faster the cleaning can be done. For example, cleaning a watercraft that does not have a significant accumulation of living organisms on its hull takes about ten seconds at a pressure of 2600 psi and a temperature of 60°C (140°F). Aquatic living organisms, after being dislodged, cannot survive long at this temperature. At the same pressure, but this time using cold water, the cleaning process will be at least 30 seconds longer per treated surface. In this case, decontamination can only dislodge living organisms and not kill them. This is why it is important to perform the cleaning process at least 30 meters away from a body of water or storm sewer system.

The use of water at a temperature of 60°C (140°F) for a treatment time of 10 seconds is a recognized way to remove 100% of zebra and quagga mussels from the treated surface. This treatment is also effective for several other AIS, such as Eurasian water-milfoil (*Myriophyllum spicatum*), New Zealand mud snail (*Potamopyrgus antipodarum*), spiny waterflea (*Bythotrephes longimanus*) and fishhook waterflea (*Cercopagis pengoi*). It should be noted that the New Zealand mud snail is not currently considered to be present in Quebec. The use of hot water at a maximum temperature of 60°C kills living organisms, without generally damaging the structure of watercraft, trailers, vehicles and some equipment used in aquatic environments. However, you should read the manufacturer's instructions to ensure this is the case.

The use of brushes and cloths is also recommended to effectively dislodge living organisms, especially in places where living organisms, mud or plant debris can accumulate. See section **2.3. Disinfectants for procedure** on how to use and decontaminate the brushes and cloths used for cleaning purposes.



### 2.2.2 Use of a steam cleaner

Decontamination using hot steam is considered to be the most effective way to kill the aquatic organisms present on a watercraft, trailer or equipment that have been in contact with water.

For steam decontamination to be effective, the water vapour must be at a temperature of 60 °C or more. Aquatic organisms cannot survive these high temperatures. At this temperature, a treatment time of less than 10 seconds will eliminate zebra mussels, quagga mussels and spiny waterfleas. The treatment time also varies according to the number of visible organisms that have accumulated on the treated surface: the thicker the layer of living organisms on the surface to be treated, the longer the treatment needed to ensure that no organisms survive. The steam treatment kills the living organisms, but does not dislodge them from the treated surface. Rinsing using a pressure washer or brush will be needed to remove the organisms from the treated surface. A steam cleaner is particularly useful to reach places where access is more difficult, such as live wells, or places that cannot be treated using a pressure washer, such as certain components of a watercraft or equipment that are sensitive to pressure.

Steam cleaning, in addition to a shorter treatment time, also reduces the volume of water used during cleaning. Household steam cleaners can be used by individuals, but industrial cleaners should be used for more intensive work, such as at a fixed cleaning station with high traffic.

It is important to ensure that the treated materials can withstand high temperatures by checking with the equipment manufacturer or by testing a small area first. In addition, you must be careful not to apply hot steam jets to decals or stickers on the watercraft hull, since hot water vapour at temperatures above 60°C could remove them. It is important to ensure that the steam cleaner is used safely, to avoid the risk of injury. The operating instructions must always be followed, and the spray must always be directed downwind.

### 2.2.3 Cleaning without a pressure washer using a brush

If it is impossible to clean the watercraft, trailer or equipment using a pressure washer, cleaning with running water, at low pressure, is always possible. However, this technique requires a longer cleaning time. Low pressure, below 2600 psi, will not dislodge living organisms as easily. Generally, water pressure from a municipal water system is about 40 psi.

Just like cleaning with a pressure washer, the use of hot water at 60°C is preferable, in order to kill any living organisms. A cold water treatment, without using a pressure washer, takes around 30 minutes, depending on the degree of visible contamination, i.e. the accumulation of living organisms on various parts of the watercraft, trailer or equipment.

This is why the use of a brush is strongly recommended to help dislodge AIS. However, after brushing each area must be rinsed thoroughly to avoid spreading AIS to other parts of the watercraft. Again, it is important to clean at least 30 meters from any body of water to avoid the percolation of water from the cleaning process, since it can carry living organisms that are still alive, especially if cold water is used for cleaning.

In addition to being rinsed, the brush and any other equipment used during cleaning (cloth, sponge, etc.) must be disinfected to avoid cross contamination when living organisms are removed from the watercraft or equipment. Refer to section **2.3. Disinfectants** to find out how to use and decontaminate brushes and cloths used during cleaning.

## 2.3 Disinfectants

For several different reasons, the Ministère recommends using disinfectants with great care when cleaning watercraft, trailers and other equipment used in aquatic environments. When disinfectants are used, it is essential to follow the instructions and to ensure that



their use will not have unwanted side effects. For example, a failure to follow product use guidelines could result in:

- Damage to equipment and various components of the watercraft;
- Degradation of water quality and damage to aquatic ecosystems;
- The risk of injury and possible impacts on human and animal health;
- Ineffective treatment and unnecessary expense.

### 2.3.1 Solution of 10% bleach, chlorine or vinegar in water

Bleach, chlorine and white vinegar are products frequently used in disinfectant solutions. They should be diluted in water (1 volume in 9 volume of water) to decontaminate a brush or cloth used in cleaning watercraft or equipment. The items should then be rinsed thoroughly with plenty of water before being used to clean another watercraft or other equipment. Some materials can be damaged by these disinfectants. Bleach is corrosive, especially for metal and rubber. In addition, bleach, even when diluted, should not come into contact with some parts of a watercraft, such as a live well. Some more permeable materials can trap the disinfectant solution, and the presence of disinfectant solution in the live well walls can damage the health of fish placed in the well.

The recommended treatment time is 10 minutes for a bleach or chlorine solution and 20 minutes for a white vinegar solution.

As with all decontamination methods, it is important to ensure that the equipment and the various parts of the watercraft can withstand treatment with the disinfectant solution used. It is also important to read the recommendations and safety guidelines for the use of the products. For example, if the product is sprayed, it should be sprayed downwind, the disinfectant solution should not be inhaled to prevent irritation of the respiratory system, the products should be used in a ventilated area, and they should never be mixed with other household products. More specifically, bleach and chlorine must never be mixed with vinegar. Once cleaning is complete, the remaining disinfectant solution must also be diluted with a large quantity of water before being discharged into a sewer, onto the ground, etc.

## 2.4 Drying

For a successful decontamination treatment, drying time should be added to eliminate any living organisms that may remain on the watercraft, trailer or equipment. If it has not been possible to decontaminate the watercraft, trailer or equipment using the methods outlined above, drying is also the best way to reduce the risks of AIS propagation between two bodies of water.

A minimum drying time of 5 consecutive days should be scheduled to ensure the elimination of living organisms. The weather conditions must also be suitable for drying: no rain and a humidity level not exceeding 65% during the 5-day period is necessary. It is also important to ensure that any pooled water is drained from the watercraft and equipment. If the weather is unfavourable (rain or high atmospheric humidity), the drying time should be extended.

When a watercraft or equipment remains in contact with water for a long period of time, a thick film can form on its surface. This film is composed of various living organisms, both plants and animals, some of which may be AIS. In this case, the services of experts in the field of watercraft cleaning will be needed for an intensive and effective cleaning. If, however, the watercraft or equipment is removed from the water to be stored for winter, the living organisms that make up the film will not survive below-freezing temperatures.

## 2.5 Freezing

Freezing is also a recognized treatment for killing aquatic organisms. When watercraft and equipment are stored for the winter, the living organisms attached to them cannot survive in the open air when temperatures are below zero for a long period of time. For effective treatment, it is recommended to expose the watercraft and equipment to temperatures between -9°C and 0°C over a period of 24 consecutive hours; for temperatures below -9°C, the exposure time is 8 consecutive hours. However, as dead living organisms are always present on the treated surface, it will be necessary to rinse them off with a pressure washer or brush.

## 2.6 Summary of decontamination methods

The table below summarizes the various decontamination methods.

**Table 2: Summary of the decontamination methods proposed in this guide**

| Method                                        | Concentration       | Pressure     | Treatment time on each surface to dislodge living organisms |
|-----------------------------------------------|---------------------|--------------|-------------------------------------------------------------|
| <b>Steam cleaning*</b>                        | Steam > 60 °C       | 2600 psi     | 5 -10 seconds                                               |
| <b>Hot water*</b>                             | 60 °C               | Low pressure | 10 minutes                                                  |
|                                               | 60 °C               | 2600 psi     | 5 -10 seconds                                               |
| <b>Cold water</b>                             | < 40 °C             | 2600 psi     | 30 seconds                                                  |
| <b>Chlorine or bleach (not concentrated)*</b> | 100 ml/l            | -            | 10 minutes                                                  |
| <b>White vinegar (100%)*</b>                  | 75 ml/l             | -            | 20 minutes                                                  |
| <b>Air drying*</b>                            | Humidity < 65%      | -            | 5 consecutive days                                          |
| <b>Freezing*</b>                              | Between -9 and 0 °C | -            | 24 hours                                                    |
|                                               | Below -9 °C         | -            | 8 hours                                                     |

\* Helps kill aquatic organisms if the guidelines are followed.

## 3 RECOMMENDATIONS FOR THE ESTABLISHMENT OF A FIXED WATERCRAFT CLEANING STATION

The use of fixed cleaning stations is strongly recommended in order to clean watercraft before accessing a body of water, or after leaving the water. In addition to providing quick access to cleaning equipment, the station can help distribute information on AIS, including information on ways to prevent the spread of AIS, cleaning guidelines, the identification of AIS, regulations concerning AIS and personal safety, and the organizations to contact if AIS are observed or to obtain information.

A watercraft can be cleaned before or after access to a body of water. The most important point is to ensure that the watercraft, trailer and equipment are decontaminated before accessing a new body of water. However, compliance with the guidelines is important in order to promote the use of the cleaning station by users of the body of water.

### 3.1 Site of the fixed cleaning station

Some sites will require only slight modifications to house a watercraft cleaning station. Others will need major modifications, such as excavation work and professional services.

#### 3.1.1 Choosing a site

The choice of site for the cleaning station site will have a major influence over its successful use. The site must be large and accessible enough to allow a vehicle and trailer to be manoeuvred into place. The more accessible and user-friendly a station is, the more it will be used. The flow of vehicles to the watercraft cleaning station must not obstruct local traffic, just as traffic on the site of the cleaning station must remain fluid.

The station should be located at or near the boat launching ramp or marina, while respecting the minimum 30 metre distance from any body of water (including streams, ditches, etc.) and storm sewer systems. This distance prevents wastewater from percolating into bodies of water and sewer systems. This is especially important when watercraft are cleaned before accessing the body of water.

However, if it is not possible to install a cleaning station near the boat launching ramp, the station should be located as close to the boat ramp as possible to encourage users to clean their watercraft. The more remote or difficult a station is to access, the less likely users will be to use it.

If there are several launching ramps and marinas in the same area, it may be preferable to build a single fixed cleaning station with the capacity to meet the needs of all the places providing access to the water.

#### 3.1.2 Recovery of waste water

The station should be installed on flat ground or on ground that slopes slightly away from the body of water, allowing waste water to drain towards an area where it can be collected, where it can evaporate, or where it can be treated if facilities are available. In some situations, a strong waterproof membrane may be used to contain the waste water, which can then be recovered and treated using a water filtration and purification system. Here is an example.



Use of a membrane to recover waste water from a watercraft decontamination station © Parcs Canada

### 3.1.3 Soil characteristics of a fixed station site

Ideally, the cleaning station should be installed on ground that has the capacity to absorb the waste water. For this purpose, the ground should be made up of gravel of various grades to confine the cleaning water and allow it to evaporate. Cleaning can also take place on a hard surface, such as concrete, with a structure to collect the cleaning water such as a channel or a water recovery tarpaulin. The cleaning water can then be directed either to the municipal sewer system for further treatment, or to a septic tank or leaching field adjacent to the station.

Other options may be considered, such as an area of grass. However, the grass must be maintained and cut regularly to ensure that vehicles and trailers do not tear it up as they pass and transport it elsewhere. A platform made of wood or a strong mesh, large enough to receive a vehicle and a trailer, is also a possibility. The ground under the platform may be gravel or grass, following the same recommendations as above.

## 3.2 Equipment needed

A minimum amount of equipment is needed to effectively clean the watercraft, trailers and equipment used for activities in aquatic environments.

### 3.2.1 Pressure washer

It is strongly recommended that a pressure washer be used to ensure effective decontamination. The pressure must be 2600 psi. A pressure of less than 2600 psi may not dislodge all living organisms. On the other hand, if the pressure is higher than 2600 psi, the pressure may damage the materials that make up the watercraft, trailer, vehicle and equipment.

**If it is impossible to use a pressure washer**, the use of a brush and running water is recommended. Care should be taken to decontaminate the brush several times during cleaning and between cleaning operations to prevent cross-contamination. Cleaning without a pressure washer will take longer. The brush can be decontaminated with a 10% solution of bleach in water. Care must

be taken to rinse the brush thoroughly in fresh water after decontamination to avoid transferring the disinfectant solution to parts of the watercraft or equipment (e.g., live wells) that could be damaged.

### 3.2.1.1 Water temperature

Although cold water can be used for cleaning, hot water has the advantage of killing living organisms. The use of hot water with a temperature of 60 °C is recommended. This temperature kills living organisms, without damaging the structure of the watercraft, trailer, vehicle and equipment used in aquatic environments.

A steam cleaner allows a shorter treatment time, in addition to reducing the volume of water used during cleaning. For a fixed high-traffic cleaning station, industrial steam cleaners are recommended. Domestic steam cleaners cannot withstand intensive use, and should only be used by individuals utilisation.

However, it is preferable to check whether the treated materials can withstand the temperatures involved by checking with the equipment manufacturer or by testing a small area.

For more information on decontamination methods, please refer to Section 2 of this guide.

### 3.2.2 Water and power supplies

In order to make the cleaning station efficient, water and power supplies are necessary. This can influence the cost of constructing and managing the station, but can also increase the station's success and rate of use.

- Cleaning cannot be done without water. Access to cold water, at least, is a necessity;
- Water can be supplied from the municipal water mains or from tanks. If necessary, in order to use the pressure washer, the water tanks should be raised to generate a the required pressure;
- A power supply must be planned to operate the pressure washer. The use of a generator could be considered, depending on the situation;
- Assistance from an electrician, plumber or contractor may be required to renovate existing facilities or to build a new fixed cleaning station.

## 3.3 Waste recovery

Equipment will be needed to recover all plant residue, mud and aquatic organisms as well as any other waste from the cleaning of the watercraft that requires disposal. The equipment must be

- Accessible and clearly visible;
- Closable, to prevent waste from blowing away towards a watercourse and to prevent animals from gaining access;
- Easy to use.

## 3.4 Warning signs, cleaning instructions and rates

### 3.4.1 Warning signs

Warning signs placed in strategic locations such as boat ramps, marinas and cleaning stations can inform users of the risk of introducing and propagating AIS through activities in aquatic environments. Examples of AIS and their impacts on local biodiversity as well as excerpts from the regulations governing activities that may introduce and propagate AIS can also be included on the sign.

### 3.4.2 Cleaning instruction signs

A simple explanatory sign about the steps in the cleaning process, placed at the cleaning station, can provide instructions and serve as a reminder. Pictograms for each step and the various parts of the watercraft and trailer that need to be inspected, drained and cleaned will ensure effective cleaning and decontamination.

### 3.4.3 Signage and identification of the cleaning station

The cleaning station identification signs direct users to the cleaning station. The signs can be used both to locate the cleaning station and to direct traffic in and out of the station.

## 3.5 Human resources

The cleaning of watercraft as a way to curb the introduction and propagation of AIS is not yet anchored in the habits of the users of the bodies of water in Québec. This is why it is important to instil this habit by using attendants to provide and supervise cleaning activities. These attendants must first be informed of the recommendations made by the Ministère with respect to watercraft cleaning to ensure that cleaning activities are effective. In addition, they will be able to inform users about the risks of introduction that arise when watercraft and equipment are used in different bodies of water.

## 3.6 Authorizations and permits

Some applications for authorizations will be needed for the construction of a watercraft cleaning station. Be sure to check with all the authorities that may be involved. The authorizations may include:

- Authorization to allow landowners to use their land for construction, access and use of a cleaning station;
- Building permits;
- Zoning permits.

## 3.7 Operation and maintenance of a cleaning station

The maintenance of a cleaning station is essential to ensure its proper operation and service life. A well maintained station will not only function and last longer, but will also attract more users. Proper winter storage or closure of the cleaning station is equally important.

## 3.8 Technical recommendations for the establishment of a fixed cleaning station

As mentioned previously, the ground on which a fixed station is built must have the capacity to absorb the water that drains from the different parts of a watercraft as well as waste cleaning water. Care must be taken to prevent the drainage of cleaning water to a body of water or storm drain.

### 3.8.1 Dimensions of a cleaning station

The dimension of a fixed cleaning station vary according to several criteria, including number of users, location, and available financial and human resources. The guidelines and dimensions below are for a single station, in other words a station with a single cleaning bay, and are provided as an indication only.

- **Dimensions of the cleaning station:** the recommended dimensions for a cleaning station are 5.50 metres (18 feet) wide by 11 metres (36 feet) long.
- **Excavation and addition of gravel** (if needed, the ground must be prepared to ensure better absorption of the cleaning water):
  - An area 5.50 metres wide by 11 metres long and 0.3 metres (1 foot) deep must be excavated;
  - If the soil is permeable, the centre of the excavated area should be filled with small-sized rock, such as gravel. If the soil is not permeable, the entire excavated area should be filled with rock of various sizes, from 19 to 38 mm (3/4 to 1 1/2 in.);
  - If the soil is very permeable, for example if it is composed of sand or coarse gravel, it may not be necessary to excavate the centre of the area. A drainage ditch 45 centimetres (18 inches) deep and 1 metre (3 feet) wide may be excavated around the outside. The centre of the area will then measure 3.6 metres (12 feet) by 9.14 metres (30 feet). The drainage ditch should be filled with 19 and 38 mm (3/4 in and 1 1/2 in) gravel. Appropriate measures must be applied to avoid erosion during the excavation work.

### 3.8.2 Drainage capacity of the cleaning station

- The access roads to the station must be made up with gravel to provide a stable base with good drainage, which will prevent erosion if the roads are not paved. Grass-covered access roads should be avoided, except for cleaning stations where traffic is occasional or light;
- Depending on traffic levels, some stations may require additional wastewater drainage;
- Good drainage for the station can also prevent erosion in the cleaning area in the event of flooding, for example following heavy rainfall. Good drainage will also prevent contaminated water from draining towards any nearby body of water;
- PVC drainage pipes can be used to improve the drainage capacity of the cleaning station. The pipes are placed in the centre of the drainage ditch, with 90-degree fittings at each corner, to form a rectangle around the station. The water collected by this drainage system may be discharged at a distance into a wooded area or field from where it may evaporate. At all times, the minimum 30-meter limit from any body of water must be respected. Several water outlets can be added in series to prevent an excessive flow at the final outlet of the evacuation system.

### 3.8.3 Water and power supplies

As mentioned previously, a power supply is a major asset for the proper operation of a cleaning station. Power is needed, among other things, to supply the pressure washer, the water pump, the station lighting, etc.

It is also possible to use a gasoline generator to provide electricity. However, it is preferable to restrict its use to stations used occasionally or sporadically, set up during events such as fishing tournaments, fishing parties or an awareness-raising activity.

In some situations, the use of a pump may also be considered. Water can be pumped from a tank provided for this purpose or from a body of water adjacent to the cleaning station. However, if the water comes from a body of water where nautical activities are practised, the cleaning must always be done when the watercraft leave the body of water, and not before they enter the water. If watercraft are cleaned before they enter the water, it is even more important to respect the minimum 30 meter distance from any body of water. In this way, living organisms that are on the watercraft will be dislodged and will drain into the cleaning area and not into the body of water.

### **3.8.4 Building or shelter**

A building or shelter may be useful for the cleaning attendants, to provide shelter on rainy or sunny days.

In addition, the cleaning equipment, pump, pressure washer, electrical panel, and educational and informational materials equipment on AIS watercraft cleaning can be stored there.

The walls of the building or shelter can be used to hang informational and educational signs about the steps in the watercraft cleaning process and other relevant information.



## APPENDIX 1: INFORMATION SHEETS FOR SPECIFIC ACTIVITIES

### Specific advice about cleaning for each activity

1. Sport fishing activities without a watercraft
2. Sport fishing activities with a watercraft
3. Nautical activities with a watercraft
4. Diving and snorkelling
5. Waterfowl hunting with or without a watercraft
6. Floatplane use

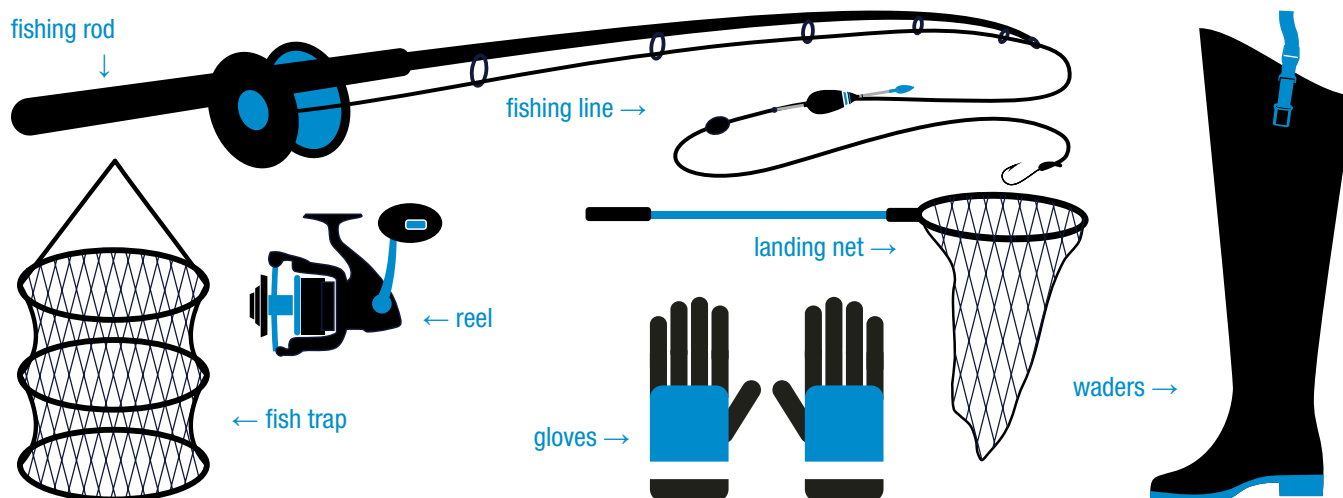


## AIS PREVENTION: INSTRUCTIONS FOR THE CLEANING OF EQUIPMENT

### Sport fishing activities without a watercraft

## INSPECT AND REMOVE

- **Inspect** the equipment and **remove** any accumulation of aquatic plants or residue, mud or living organisms visible to the naked eye;
- In addition, **inspect** boots, waders, nets and landing nets, fishing lines and fishing rods and any other equipment that has come into contact with the water before leaving the body of water;
- It is important to dispose of the living organisms, accumulations of plant matter or mud removed during the inspection in a safe place such as a closed garbage container, where there is no risk of them being blown into a body of water by the wind;
- Fishers who use a watercraft should refer to the information sheet **Sport fishing with a watercraft** in this document.



## DRAIN

- **Drain** any water found in equipment such as containers, coolers, boots, etc.;
- The water must be drained into the body of water you visited, before leaving that body of water. If this is not possible, the water must be drained to a point at least 30 metres from any body of water (such as a stream, lake, river, storm drain, etc.) and onto an absorbent surface (such as grass, gravel, etc.) to prevent the waste water from draining towards the nearest body of water.

## CLEAN AND DRY

- **Clean** equipment using a pressure washer with the pressure set at 2600 psi. Cold or hot water can be used for cleaning. Cleaning using a pressure washer and cold water will dislodge living organisms, but will not kill them. On the other hand, cleaning with a pressure washer using hot water will both dislodge and kill living organisms. However, the temperature must be between 50 °C and 60 °C. Equipment must be cleaned at least 30 metres from any body of water or storm drain system to prevent any living organisms that are still alive from reaching another body of water;
- It is important to check the resistance of each material before using a pressure washer and hot water for cleaning. **Cleaning** using a pressure washer (at a pressure of 2600 psi) and water at a high temperature may damage some types of material;
- A brush may be used to remove all residue from some equipment parts and components. The brush must be disinfected using a solution of 10% bleach in water, left to soak for around 10 minutes, and then rinsed in fresh water. The brush must be disinfected after every cleaning. It is important to check the resistance of each materials before cleaning it using a brush;
- The water used to **clean** equipment must be drained onto absorbent ground, or into the **sanitary sewer** system to be treated by the municipality. **Close attention** must be paid to ensure that the contaminated water does not flow towards a **storm sewer**. The contaminated water could quickly reach another watercourse without being treated and AIS could be introduced into a new environment. This is why it is safer to drain contaminated water onto absorbent ground (such as grass or gravel, etc.) at least 30 metres from any watercourse;
- Drying the equipment is the last step in the cleaning process and ensures complete decontamination. The equipment should be left to dry in the open air for a period of 5 consecutive days, at a humidity level of no more than 65%. It is important to check the resistance of each material before drying it in full sunlight. Some types of equipment may be damaged by prolonged exposure to sunlight. Exposure to the open air at temperatures of 0 °C and colder can also be used to decontaminate equipment. Living organisms cannot survive for long during extended exposure to below-zero temperatures. However, since dead organisms will still be present on the treated surface, they must be dislodged by rinsing using a pressure washer or brush.

## REPEAT

- Repeat these steps each time you plan to visit a new body of water.

### OTHER

If possible, fishing boots with non-slip felt soles should not be used. Felt absorbs and retains water, risking the introduction and propagation of AIS between bodies of water. However, if felt-soled boots are used, they should be rinsed, cleaned and dried according to the instructions above;

**Never release** fish and other living organisms into a body of water if they did not come from that body of water, including authorized bait (worms, leaches, etc.).



## AIS PREVENTION: INSTRUCTIONS FOR THE CLEANING OF EQUIPMENT

### Sport fishing activities with a watercraft

Covering all types of watercraft: rowboat, canoe, motor boat, kayak, etc.

## INSPECT AND REMOVE

- Inspect the watercraft, trailer and equipment and remove any accumulation of aquatic plants or residue, mud or living organisms visible to the naked eye;
- In addition, **inspect** the engine, boots, waders, anchors, nets and landing nets, fishing lines, ropes and any other equipment before leaving the waterside;
- It is important to dispose of the living organisms, accumulations of plant matter and mud removed during the inspection in a safe place such as a closed garbage container, where there is no risk of them being blown into a body of water by the wind;
- Fishers not using a watercraft should refer to the information sheet **Sport fishing activities without a watercraft** in this document.



## DRAIN

- **Drain** all the water that may have accumulated in the engine, live wells, the bilges of the watercraft, coolers, and in any other container and any other structure that may contain standing water;
- The water must be drained into the body of water you visited, before leaving that body of water. If this is not possible, the water must be drained to a point at least 30 metres from any body of water (such as a stream, lake, river, storm drain, etc.) and onto an absorbent surface (such as grass, gravel, etc.) to prevent the waste water from draining towards the nearest body of water.

## CLEAN AND DRY

- If possible, **clean** equipment using a pressure washer with the pressure set at 2600 psi. Cold or hot water can be used for cleaning. Cleaning using a pressure washer and cold water will dislodge living organisms, but will not kill them. On the other hand, cleaning with a pressure washer using hot water will both dislodge and kill living organisms. However, the temperature must be between 50 °C and 60 °C. Equipment must be cleaned at least 30 metres from any body of water or storm drain system to prevent any living organisms that are still alive from reaching another body of water;
- It is important to check the resistance of each material before using a pressure washer and hot water for cleaning. **Cleaning** using a pressure washer (at a pressure of 2600 psi) and water at a high temperature may damage some types of material;
- A brush may be used to remove all residue from some equipment parts and components. The brush must be disinfected using a solution of 10% bleach in water, left to soak for around 10 minutes, and then rinsed in fresh water. The brush must be disinfected after every cleaning. It is important to check the resistance of each materials before cleaning it using a brush;
- The water used to **clean** equipment must be drained onto absorbent ground, or into the **sanitary sewer** system to be treated by the municipality. **Close attention** must be paid to ensure that the contaminated water does not flow towards a **storm sewer**. The contaminated water could quickly reach another watercourse without being treated and AIS could be introduced into a new environment. This is why it is safer to drain contaminated water onto absorbent ground (such as grass or gravel, etc.) at least 30 metres from any watercourse;
- Drying the watercraft and equipment is the last step in the cleaning process and ensures complete decontamination. The watercraft and equipment should be left to dry in the open air for a period of 5 consecutive days, at a humidity level of no more than 65%. It is important to check the resistance of each material before drying it in full sunlight. Some types of equipment may be damaged by prolonged exposure to sunlight. Exposure to the open air at temperatures of 0 °C and colder can also be used to decontaminate equipment. Living organisms cannot survive for long during extended exposure to below-zero temperatures. However, since dead organisms will still be present on the treated surface, they must be dislodged by rinsing using a pressure washer or brush.

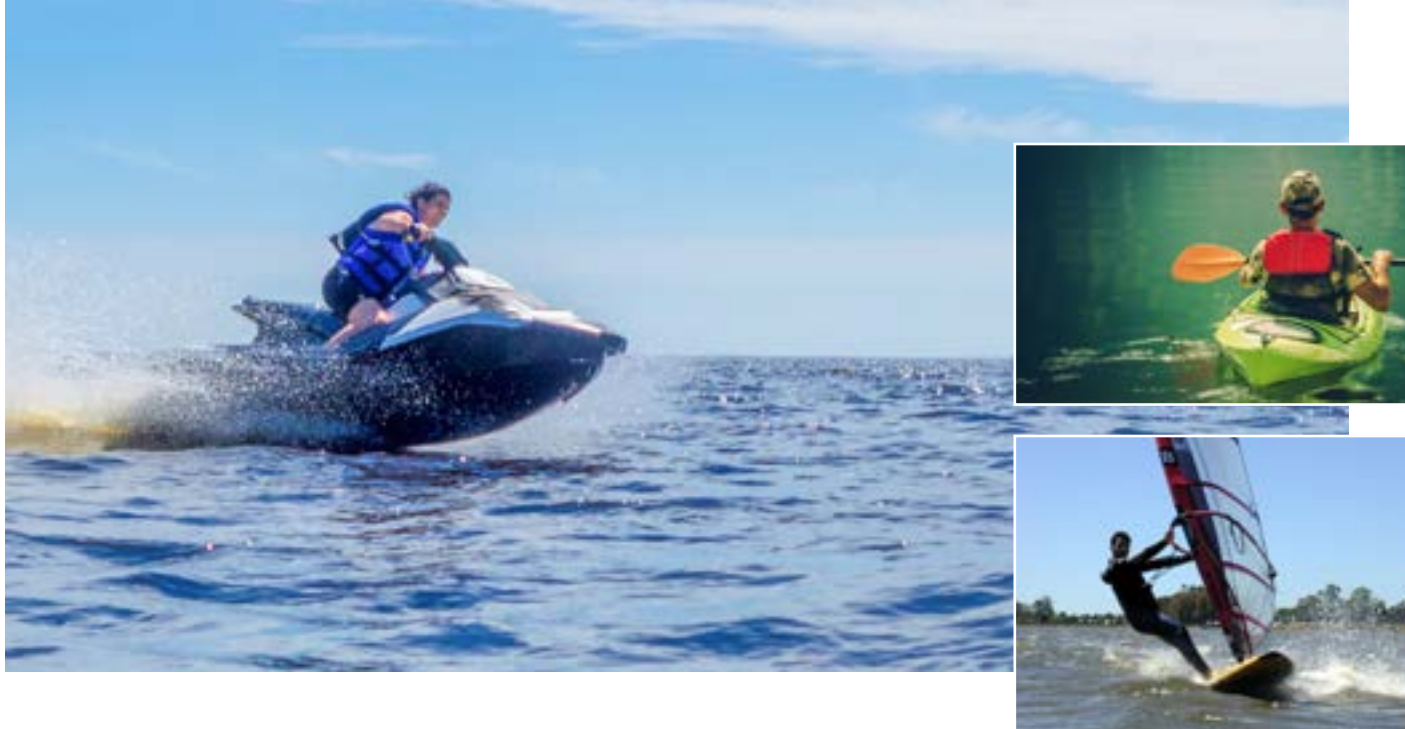
## REPEAT

- Repeat these steps each time you plan to visit a new body of water.

### OTHER

If possible, fishing boots with non-slip felt soles should not be used. Felt absorbs and retains water, risking the introduction and propagation of AIS between bodies of water. However, if felt-soled boots are used, they should be rinsed, cleaned and dried according to the instructions above;

**Never release** fish and other living organisms into a body of water if they did not come from that body of water, including authorized bait (worms, leaches, etc.).



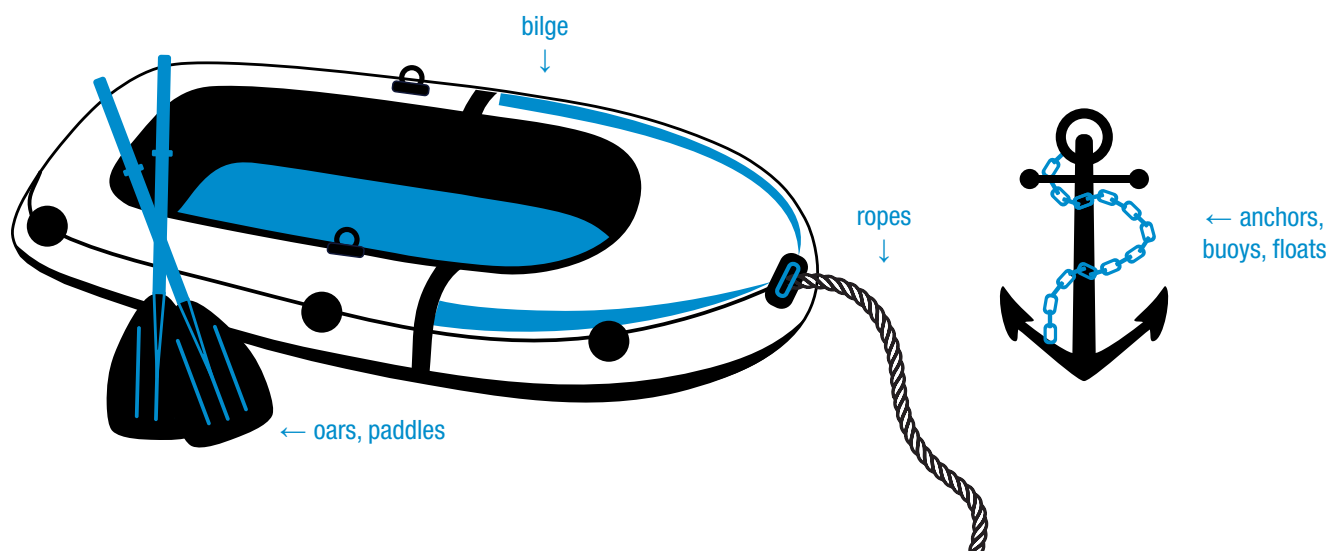
## AIS PREVENTION: INSTRUCTIONS FOR THE CLEANING OF EQUIPMENT

### Nautical activities with a watercraft

Jet ski, water skis, wakeboard, kayak, canoe, kiteboard, etc.

## INSPECT AND REMOVE

- **Inspect** the equipment and **remove** any accumulation of aquatic plants or residue, mud or living organisms visible to the naked eye;
- In addition, **inspect** the engine, trailer and equipment used during nautical activities, such as anchors, sails, ropes, paddles and other items before leaving the waterside;
- It is important to dispose of the living organisms, accumulations of plant matter and mud removed during the inspection in a safe place such as a closed garbage container, where there is no risk of them being blown into a body of water by the wind;



## DRAIN

- **Drain** all the water that may have accumulated in the various parts and components of your watercraft and equipment (engine, tank, coolers, etc.);
- The water must be drained into the body of water you visited, before leaving that body of water. If this is not possible, the water must be drained to a point at least 30 metres from any body of water (such as a stream, lake, river, storm drain, etc.) and onto an absorbent surface (such as grass, gravel, etc.) to prevent the waste water from draining towards the nearest body of water.

## CLEAN AND DRY

- If possible, **clean** equipment using a pressure washer with the pressure set at 2600 psi. Cold or hot water can be used for cleaning. Cleaning using a pressure washer and cold water will dislodge living organisms, but will not kill them. On the other hand, cleaning with a pressure washer using hot water will both dislodge and kill living organisms. However, the temperature must be between 50 °C and 60 °C. Equipment must be cleaned at least 30 metres from any body of water or storm drain system to prevent any living organisms that are still alive from reaching another body of water;
- It is important to check the resistance of each material before using a pressure washer and hot water for cleaning. **Cleaning** using a pressure washer (at a pressure of 2600 psi) and water at a high temperature may damage some types of material;
- A brush may be used to remove all residue from some equipment parts and components. The brush must be disinfected using a solution of 10% bleach in water, left to soak for around 10 minutes, and then rinsed in fresh water. The brush must be disinfected after every cleaning. It is important to check the resistance of each materials before cleaning it using a brush;
- The water used to **cleaning** equipment must be drained onto absorbent ground, or into the **sanitary sewer** system to be treated by the municipality. **Close attention** must be paid to ensure that the contaminated water does not flow towards a **storm sewer**. The contaminated water could quickly reach another watercourse without being treated and AIS could be introduced into a new environment. This is why it is safer to drain contaminated water onto absorbent ground (such as grass or gravel, etc.) at least 30 metres from any watercourse;
- Drying watercraft and equipment is the last step in the cleaning process and ensures complete decontamination. The watercraft and equipment should be left to dry in the open air for a period of 5 consecutive days, at a humidity level of no more than 65%. It is important to check the resistance of each material before drying it in full sunlight. Some types of equipment may be damaged by prolonged exposure to sunlight. Exposure to the open air at temperatures of 0 °C and colder can also be used to decontaminate equipment. Living organisms cannot survive for long during extended exposure to below-zero temperatures. However, since dead organisms will still be present on the treated surface, they must be dislodged by rinsing using a pressure washer or brush.

## REPEAT

- Repeat these steps each time you plan to visit a new body of water.



## AIS PREVENTION: INSTRUCTIONS FOR THE CLEANING OF EQUIPMENT

### Diving and snorkelling With or without a watercraft

#### INSPECT AND REMOVE

- **Inspect** all the equipment used and **remove** any accumulation of aquatic plants or residue, mud or living organisms visible to the naked eye;
- In addition, **inspect** the diving suit, mask, snorkel, flippers, stability vest, regulator, diving cylinders, harness, belt and any other equipment used during your diving activities;
- If a watercraft has been used, it must also be inspected and cleaned (refer to the information sheet **Nautical activities with a watercraft**);
- It is important to dispose of the living organisms, accumulations of plant matter and mud removed during the inspection in a safe place such as a closed garbage container, where there is no risk of them being blown into a body of water by the wind;

#### DRAIN

- **Drain** all the water that may have accumulated in the various parts and components of your equipment (stability vest, regulator, harness, etc.) and any other equipment that may contain water;
- If a watercraft has been used, it must also be inspected and cleaned (refer to the information sheet **Nautical activities with a watercraft**);
- The water must be drained into the body of water you visited, before leaving that body of water. If this is not possible, the water must be drained to a point at least 30 metres from any body of water (such as a stream, lake, river, storm drain, etc.) and onto an absorbent surface (such as grass, gravel, etc.) to prevent the waste water from draining towards the nearest body of water.

#### CLEAN AND DRY

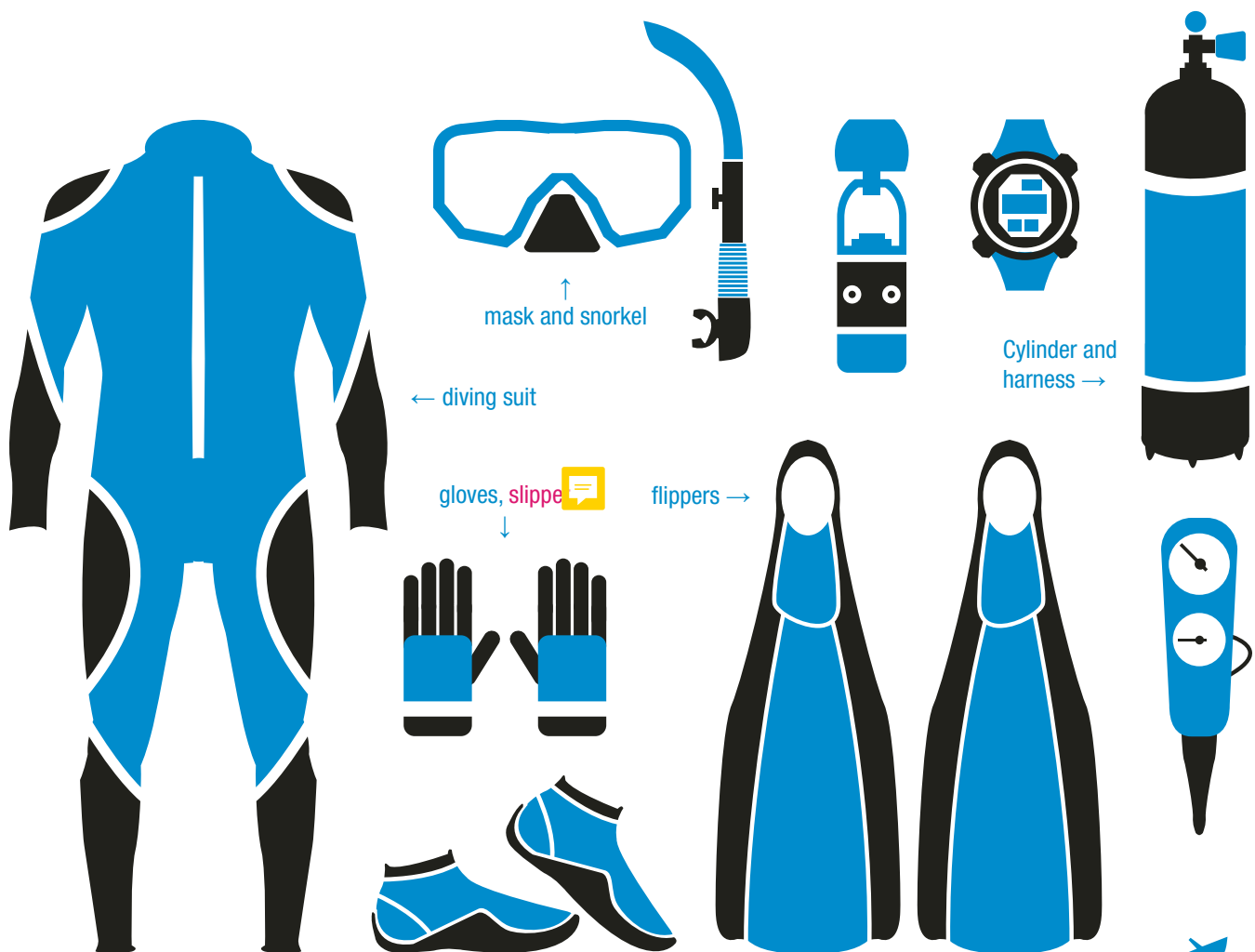
- If possible, **clean** the watercraft, trailer and equipment using a pressure washer with the pressure set at 2600 psi. Cold or hot water can be used for cleaning. Cleaning using a pressure washer and cold water will dislodge living organisms, but will not kill them. On the other hand, cleaning with a pressure washer using hot water will both dislodge and kill living organisms. However, the temperature must be between 50 °C and 60 °C. Equipment must be cleaned at least 30 metres from any body of water or storm drain system to prevent any living organisms that are still alive from reaching another body of water;
- It is important to check the resistance of each material before using a pressure washer and hot water for cleaning. **Cleaning** using a pressure washer (at a pressure of 2600 psi) and water at a high temperature may damage some types of material;
- A brush may be used to remove all residue from some equipment parts and components. The brush must be disinfected using a solution of 10% bleach in water, left to soak for around 10 minutes, and then rinsed in fresh water. The brush must be disinfected after every cleaning. It is important to check the resistance of each materials before cleaning it using a brush;
- The water used to **clean** equipment must be drained onto absorbent ground, or into the **sanitary sewer** system to be treated by the municipality. **Close attention** must be paid to ensure that the contaminated water does not flow towards a **storm sewer**. The contaminated water could quickly reach another watercourse without being treated and AIS could be introduced

into a new environment. This is why it is safer to drain contaminated water onto absorbent ground (such as grass or gravel, etc.) at least 30 metres from any watercourse;

- Drying watercraft and equipment is the last step in the cleaning process and ensures complete decontamination. The watercraft and equipment should be left to dry in the open air for a period of 5 consecutive days, at a humidity level of no more than 65%. It is important to check the resistance of each material before drying it in full sunlight. Some types of equipment may be damaged by prolonged exposure to sunlight. Exposure to the open air at temperatures of 0 °C and colder can also be used to decontaminate equipment. Living organisms cannot survive for long during extended exposure to below-zero temperatures. However, since dead organisms will still be present on the treated surface, they must be dislodged by rinsing using a pressure washer or brush.

## REPEAT

- Repeat these steps each time you plan to visit a new body of water.





## AIS PREVENTION: INSTRUCTIONS FOR THE CLEANING OF EQUIPMENT

### Waterfowl hunting with or without a watercraft

## INSPECT AND REMOVE

- **Inspect** the watercraft, trailer and equipment and remove any accumulation of aquatic plants or residue, mud or living organisms visible to the naked eye;
- In addition, **inspect** all guns, boots, waders, decoys, bags and other equipment before leaving the waterside;
- If you are accompanied by a hunting dog, inspect its fur, harness and life jacket and remove all traces of mud, residue and plant matter;
- If a watercraft has been used, it must also be inspected and cleaned (refer to the information sheet **Nautical activities with a watercraft**);
- If you used a portable hunting blind, remove all mud, residue and plant matter when you dismantle it;
- It is important to dispose of the living organisms, accumulations of plant matter and mud removed during the inspection in a safe place such as a closed garbage container, where there is no risk of them being blown into a body of water by the wind;

## DRAIN

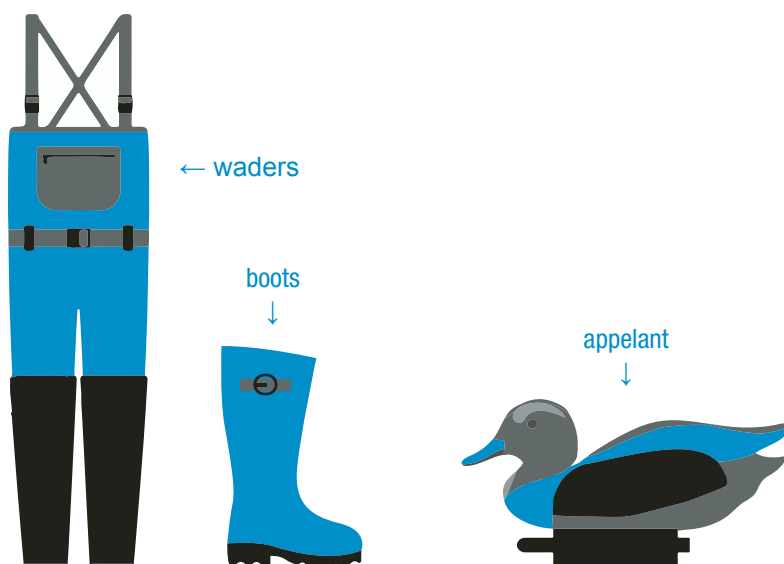
- **Drain** all the water that may have accumulated in the various parts and components of your watercraft and equipment (engine, tank, coolers, etc.);
- The water must be drained into the body of water you visited, before leaving that body of water. If this is not possible, the water must be drained to a point at least 30 metres from any body of water (such as a stream, lake, river, storm drain, etc.) and onto an absorbent surface (such as grass, gravel, etc.) to prevent the waste water from draining towards the nearest body of water.

## CLEAN AND DRY

- If possible, **clean** equipment using a pressure washer with the pressure set at 2600 psi. Cold or hot water can be used for cleaning. Cleaning using a pressure washer and cold water will dislodge living organisms, but will not kill them. On the other hand, cleaning with a pressure washer using hot water will both dislodge and kill living organisms. However, the temperature must be between 50 °C and 60 °C. Equipment must be cleaned at least 30 metres from any body of water or storm drain system to prevent any living organisms that are still alive from reaching another body of water;
- It is important to check the resistance of each material before using a pressure washer and hot water for cleaning. **Cleaning** using a pressure washer (at a pressure of 2600 psi) and water at a high temperature may damage some types of material;
- A brush may be used to remove all residue from some equipment parts and components. The brush must be disinfected using a solution of 10% bleach in water, left to soak for around 10 minutes, and then rinsed in fresh water. The brush must be disinfected after every cleaning. It is important to check the resistance of each materials before cleaning it using a brush;
- The water used to **clean** equipment must be drained onto absorbent ground, or into the **sanitary sewer** system to be treated by the municipality. **Close attention** must be paid to ensure that the contaminated water does not flow towards a **storm sewer**. The contaminated water could quickly reach another watercourse without being treated and AIS could be introduced into a new environment. This is why it is safer to drain contaminated water onto absorbent ground (such as grass or gravel, etc.) at least 30 metres from any watercourse;
- Drying watercraft and equipment is the last step in the cleaning process and ensures complete decontamination. The watercraft and equipment should be left to dry in the open air for a period of 5 consecutive days, at a humidity level of no more than 65%. It is important to check the resistance of each material before drying it in full sunlight. Some types of equipment may be damaged by prolonged exposure to sunlight. Exposure to the open air at temperatures of 0 °C and colder can also be used to decontaminate equipment. Living organisms cannot survive for long during extended exposure to below-zero temperatures. However, since dead organisms will still be present on the treated surface, they must be dislodged by rinsing using a pressure washer or brush.

## REPEAT

- Repeat these steps each time you plan to visit a new body of water.





## AIS PREVENTION: INSTRUCTIONS FOR THE CLEANING OF EQUIPMENT

### Floatplane use

## INSPECT AND REMOVE

- **Inspect** the floatplane and **remove** any accumulation of aquatic plants or residue, mud or living organisms visible to the naked eye;
- In addition, **inspect** all ropes, cables, floats and other equipment before leaving the waterside;
- **Before taking off**, avoid taxiing over aquatic plants, and raise and lower the rudders several times to dislodge any fragments of aquatic plants;
- **After taking off**, raise and lower the rudders several times to dislodge any fragments of aquatic plants while still over the body of water you have just left;
- If a trailer is used when the floatplane enters or leaves the water, it must be inspected in accordance with the instructions above.

## DRAIN

- **Drain**, before taking off, any water that may have accumulated in the parts of the floatplane that have been in contact with the body of water or that may contain water from the body of water, such as the floats, engine and other equipment;
- The water must be drained into the body of water you visited, before leaving that body of water.

## CLEAN AND DRY

- If possible, **clean** the floatplane and equipment using a pressure washer with the pressure set at 2600 psi. Cold or hot water can be used for cleaning. Cleaning using a pressure washer and cold water will dislodge living organisms, but will not kill them. On the other hand, cleaning with a pressure washer using hot water will both dislodge and kill living organisms. However, the temperature must be between 50 °C and 60 °C. Equipment must be cleaned at least 30 metres from any body of water or storm drain system to prevent any living organisms that are still alive from reaching another body of water;

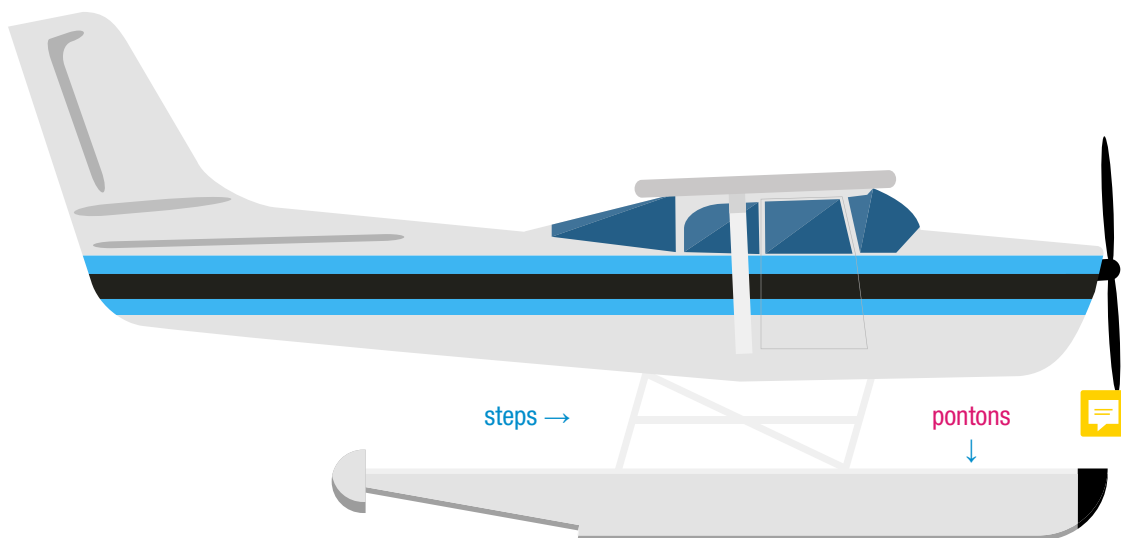
- It is important to check the resistance of each material before using a pressure washer and hot water for cleaning. **Cleaning** using a pressure washer (at a pressure of 2600 psi) and water at a high temperature may damage some types of material;
- When the floatplane is taken out of the body of water to be cleaned, the water used to **clean** equipment must be drained onto absorbent ground, or into the **sanitary sewer** system to be treated by the municipality. **Close attention** must be paid to ensure that the contaminated water does not flow towards a **storm sewer**. The contaminated water could quickly reach another watercourse without being treated and AIS could be introduced into a new environment. This is why it is safer to drain contaminated water onto absorbent ground (such as grass or gravel, etc.) at least 30 metres from any watercourse;
- A brush may be used to remove all residue from some equipment parts and components. The brush must be disinfected using a solution of 10% bleach in water, left to soak for around 10 minutes, and then rinsed in fresh water. The brush must be disinfected after every cleaning. It is important to check the resistance of each materials before cleaning it using a brush;
- Drying the equipment may also be chosen as a decontamination method. It is the last step in the cleaning process and allows full decontamination. The watercraft and equipment should be left to dry in the open air for a period of 5 consecutive days, at a humidity level of no more than 65%. Some types of equipment may be damaged by prolonged exposure to sunlight. It is important to check the resistance of each material before drying it in full sunlight. Exposure to the open air at temperatures of 0 °C and colder can also be used to decontaminate equipment. Living organisms cannot survive for long during extended exposure to low temperatures. However, since dead organisms will still be present on the treated surface, they must be dislodged by rinsing using a pressure washer or brush.

## REPEAT

- Repeat these steps each time you plan to visit a new body of water.

### OTHER

Floatplanes anchored for a long period of time must be cleaned regularly to prevent the accumulation of aquatic organisms on the parts that are in contact with the water and their propagation to another body of water.





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