

PROTOCOL FOR DISINFECTING BOATS IN MASSES OF WATER INFECTED WITH THE ZEBRA MUSSEL (*Dreissena Polymorpha*)



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A. MOTOR BOATS

General Recommendations

At the sampling location, the remains of the ballast water, live tanks containers, bilge piping will all be emptied of water, as well as equipment that has been in contact with the water.

Using hot water under pressure, any individual mussels will be removed along with remains of vegetation which has stuck to the hull or engine.

If disinfection at the place of departure of the vessel is not possible, the nearest disinfecting station must be used. However, if the boat is not going to be used for five days, it must be left to dry in the sun for a period of at least 5 days. This period may be extended to 10 days if the temperature and relative humidity at the location requires it. The boat will then be able to be used in another body of water.

Refill the engine coolant circuit with clean water. Before doing so, it is recommended to rev the engine just before stopping it to increase the movement of water and temperature of the engine, thereby killing any larvae. The engine is subsequently removed from the water and rinsed with clean water.

Disinfectant solution (at a concentration of 1 mL of 5% bleach per litre, ie about 20 drops per litre) should then be sprayed in less accessible areas of the vessel.

Special care and attention should be taken with those parts that may unexpectedly contain mussels, such as the ridges in the soles of boots, hooks, screws, etc.

Fishing gear (nets, traps, etc) should be disinfected, either by immersion in or spraying with disinfectant solution. The disinfectant will be a dilute bleach solution, made by adding 20 drops of bleach (of 4-5% concentration) to 1 litre of water. Special care must be taken to prevent the used disinfectant solution from entering the aquatic environment, thereby preventing damage to other organisms.

The organisers of any sporting competition, in an area infested with zebra mussel larvae, will have to have a high pressure water jet facility available (a steam cleaner or similar) and ensure that all participating boats receive proper treatment.



Cleaning the exterior parts of the boat, trailer and vehicle

All parts of the boat, trailer and vehicle that have been in contact with the water must be cleaned, as well as vessels or containers used as live tanks for the storage of waste water or water from the river.

The minimum temperature of the wash water should be 60°C, and preferably be a bleach solution.

The water used for cleaning the boat must not enter any water courses or sewage systems. It must be collected in containers or poured directly on filter beds.

High pressure washers with the following features are recommended:

- **Pressure:** 160 bar minimum.
- **Working temperature:** 60°C minimum. Instantaneous heating.
- **Flow rate:** 600 - 1200 L/hr
- A **hose** long enough to comfortably reach all parts to be washed

- Supply: preferably diesel, to ensure operation in any location without the need of an electric generator.

Cleaning the engine cooling system

This must be carried out with a system that ensures hot water circulation (60°C) through the engine's cooling system. There are two main methods:

- **Immerse the engine in a container of hot water:** for small engines.
- **Circulate hot water under pressure through the cooling circuit.** Directly, if possible, or with the help of special parts to make this task easier.

B. VESSELS WITHOUT AN ENGINE

Before putting the boat in the river, it must be ensured that the boat or canoe is completely dry and clean, to prevent the transfer of mussel larvae and adults.

At the landing location, all water inside the boat or canoe must be emptied. If the canoe cannot be submerged, the inside of the hull must also be emptied.

Carefully inspect the vessel to remove any individual zebra mussels and visible remnants of vegetation.

Boats in quarantine

- Dry the inside and outside with a sponge or a cloth.
- If the boat is not going to be used for five days, it must be left to dry in the sun for a period of at least 5 days. This period may be extended to 10 days if the temperature and relative humidity at the location requires it. The boat will then be able to be used in another body of water.

Disinfecting boats

- If the canoe or boat cannot be quarantined, the inside and outside of the boat must be thoroughly cleaned with a bleach solution from a pressure hose. It must then be emptied and dried carefully, so that there is no remnant of moisture where zebra mussel larvae can survive and be transported to another body of water.



- Disinfectant solution (at a concentration of 1 mL of 5% bleach per litre, ie about 20 drops per litre) should then be sprayed in less accessible areas of the vessel.

Disinfecting equipment

- The rest of the sporting equipment that has been in contact with the water (helmet, oars, lifejackets, etc) must be disinfected, either by soaking, immersion or



spraying with a disinfectant solution (at a concentration of 1 mL of 5% bleach per litre, ie about 20 drops per litre). Special care must be taken to prevent the used disinfectant solution from entering the aquatic environment, thereby preventing damage to other organisms.

- Special care and attention should be taken with those parts that may unexpectedly contain mussels, such as the ridges in the soles of boots, hooks, screws, etc.

Competitions

The organisers of any sporting competition, such as canoeing or rowing, in an area infested with zebra mussel larvae, will have to have a high pressure water jet facility available (a steam cleaner or similar) and ensure that all participating boats receive proper treatment using the second type.

Surfing

All different types of surfboards, including other methods of flotation, will be subjected to disinfection and cleaning in a similar manner to rowing boats.

C. SAILING BOATS

The process of disinfection and cleaning of sailing boats will be the same as that for a rowing boat. If it has an auxiliary engine available, this will be cleaned as the engine in motor boats.

The species is currently spreading, and so may actually be present in places where it has not yet been officially detected. Therefore, always act as if it is present.

If you see something which is similar to a zebra mussel or suspect that it is present, contact the Basque Water Agency. (TEL.: 945 01 1898/945 01 1700)

Protocol for disinfecting equipment in water bodies infected with the zebra mussel (*Dreissena polymorpha*)

After fishing, sampling or aquatic activities in water bodies known or suspected to contain the zebra mussel, in any of its life cycle phases, all equipment that has entered the water body must be inspected and disinfected before being used in another location.

When planning any type of sampling, it is recommended to first sample unaffected water bodies to avoid accidentally infecting them.

Sampling equipment (boots, neoprene protective gear, wading gear, nets, containers, disposable gloves, sensors, etc).

Bathing accessories (surfboards, inflatable floats, etc)

Fishing equipment (different nets, rods, wading equipment, etc)

I. Removing water. Visual inspection and waste disposal

- In the same location as the sampling, fishing or bathing has taken place, the remnants of the water must be meticulously removed from all equipment and bathing gear.
- All equipment must be visually inspected to remove any zebra mussels seen and remains of vegetation.
- Gloves and disposable materials must be stored in a bag, to be subsequently deposited in an appropriate container.

2. Cleaning and disinfection

- The in situ measuring equipment sensors in the measuring spot, must be cleaned in the sampling location with plenty of distilled water to remove all dirt.
- Fishing equipment (nets, traps, etc), sampling equipment and all bathing accessories must be disinfected by soaking, immersing or spraying with a disinfectant solution of 5 mg free chlorine / L. Both the water emptied and that used for washing may contain zebra mussel larvae and must in no circumstances be disposed of in water courses or sewage systems. It must be collected in special containers or disposed of directly on filter beds.

Quantities of bleach to add to water to prepare a solution with 5 mg of free chlorine / L:

Volume of treated water / Litres	Volume of bleach
10	0.25 mL or 25 drops
100	2.5mL or half a glass *
1000 (1 m3)	25 mL or 5 glasses *

* A glass with a volume of 250mL (a quarter of a litre)

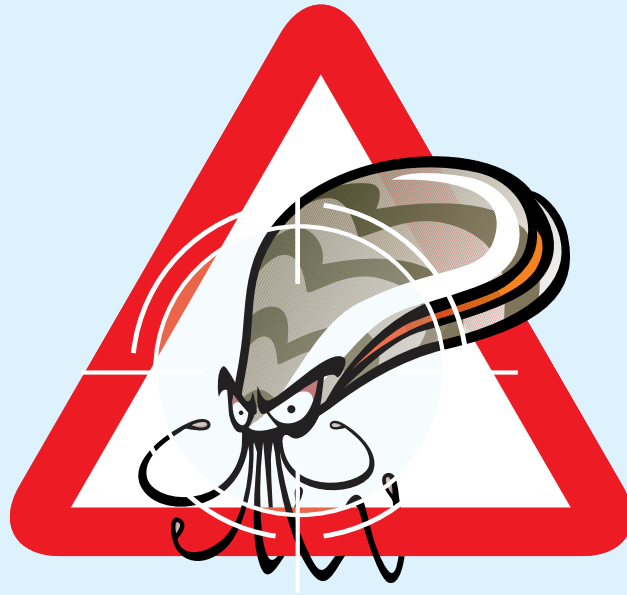
Special care and attention should be taken with those parts that may inadvertently contain mussels, such as the ridges in the soles of boots, hooks, screws, etc.

If disinfection in the sampling location is impossible, the nearest disinfection station must be used.

3. Drying

If the equipment is not going to be used for at least ten days, it can be dried manually and left to dry in the sun for at least 10 days. This may be extended to 20 days if the location temperature and relative humidity conditions require, before being re-used in another water body.





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