

[Fisheries and Oceans Canada](#)

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Measures to avoid causing harm to fish and fish habitat including aquatic species at risk

If you are conducting a project near water, it is your responsibility to ensure you avoid causing serious harm to fish in compliance with the Fisheries Act and avoid contravening SARA prohibitions. The following advice will help you avoid causing harm and comply with both Acts.

PLEASE NOTE: This advice applies to all project types and replaces all "Operational Statements" previously produced by DFO for different project types in all regions. Projects near water must also comply with the pollution prevention provisions of the Fisheries Act.

Measures

► Project planning

► Erosion and sediment control

► Shoreline/bank re-vegetation and stabilization

▼ Fish protection

- Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows, or result in the stranding or death of fish.
- Retain a qualified environmental professional to ensure appropriate protocols are applied, and applicable permits for relocating fish are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site.

SARA-listed aquatic species

Any capture and relocation of an endangered or threatened aquatic species at risk will require approval from DFO. See the protocols for [the detection and relocation of certain aquatic species at risk](#).

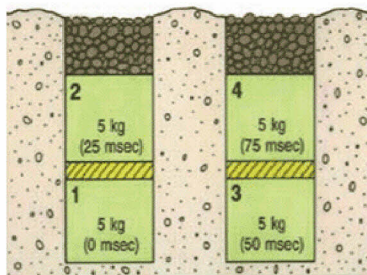
- Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.
 - In freshwater, follow these measures for design and installation of intake end of pipe fish screens to protect fish where water is extracted from fish-bearing waters:
 - Screens should be located in areas and depths of water with low concentrations of fish throughout the year.
 - Screens should be located away from natural or artificial structures that may attract fish that are migrating, spawning, or in rearing habitat.
 - The screen face should be oriented in the same direction as the flow.
 - Ensure openings in the guides and seals are less than the opening criteria to make "fish tight".
 - Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.
 - Structural support should be provided to the screen panels to prevent sagging and collapse of the screen.
 - Large cylindrical and box-type screens should have a manifold installed in them to ensure even water velocity distribution across the screen surface. The ends of the structure should be made out of solid materials and the end of the manifold capped.
 - Heavier cages or trash racks can be fabricated out of bar or grating to protect the finer fish screen, especially where there is debris loading (woody material, leaves, algae mats, etc.). A 150 mm (6 in.) spacing between bars is typical.
 - Provision should be made for the removal, inspection, and cleaning of screens.
 - Ensure regular maintenance and repair of cleaning apparatus, seals, and screens is carried out to prevent debris-fouling and impingement of fish.
 - Pumps should be shut down when fish screens are removed for inspection and cleaning.
- Avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.

SARA-listed aquatic species

Do not use explosives where SARA-listed aquatic species, their residences or critical habitat occur, without review by DFO.

- If explosives are required as part of a project (e.g., removal of structures such as piers, pilings, footings; removal of obstructions such as beaver dams; or preparation of a river or lake bottom for installation of a structure such as a dam or water intake), the potential for impacts to fish and fish habitat should be minimized by implementing the following measures:
 - Time in-water work requiring the use of explosives to prevent disruption of vulnerable fish life stages, including eggs and larvae, by adhering to appropriate fisheries timing windows.
 - Isolate the work site to exclude fish from within the blast area by using, for example, bubble/air curtains (i.e., a column of bubbled water extending from the substrate to the water surface as generated by forcing large volumes of air through a perforated pipe/hose), cofferdams or aquadams.
 - Remove any fish trapped within the isolated area and release unharmed beyond the blast area prior to initiating blasting
 - Minimize blast charge weights used and subdivide each charge into a series of smaller charges in blast holes (i.e., decking) with a minimum 25 millisecond (1/1000 seconds) delay between charge detonations (see Figure 1).
 - Back-fill blast holes (stemmed) with sand or gravel to grade or to streambed/water interface to confine the blast.
 - Place blasting mats over top of holes to minimize scattering of blast debris around the area.
 - Do not use ammonium nitrate based explosives in or near water due to the production of toxic by-products.
 - Remove all blasting debris and other associated equipment/products from the blast area.

Figure 1: sample blasting arrangement



Per Fig. 1: 20 kg total weight of charge; 25 msecs delay between charges and blast holes; and decking of charges within holes.

► **Operation of machinery**

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