

Plastic (used for flotation)

Plastic has become a common building material for docks, particularly for flotation. Most plastic materials will not affect water quality. They are tough and float well when sealed but can deteriorate over time from exposure to wind, waves and ultraviolet light. Visit your local building supply outlet to determine the best type of plastic for your project. Plastic flotation materials are available in many shapes, sizes and colours and are ideal for making floating docks and swimming platforms.

Plastic may also be used for the decking of a dock. Although it lacks strength, when supported by a wooden foundation, plastic decking can be appropriate given its waterproof and decay-resistant properties.



Dock under construction using untreated wood and blue polystyrene for flotation.

Polystyrene

Polystyrene (plastic foam) has little effect on water quality. However, some forms of polystyrene, particularly white expanded polystyrene, break down over time. This can be hazardous for fish and other aquatic organisms as they may try to ingest small pieces, mistaking them for food.

For flotation devices in docks, boathouses or swimming platforms, the blue or pink closed-cell extruded polystyrene billets are recommended. The billets should be wrapped in polyethylene sheeting to protect them from accidental gasoline spills.

Working together to protect fish habitat

Help maintain the quality of fish habitat in our lakes and streams. Please contact agency staff before beginning any work in or around water.

For further information or to obtain copies of other fact sheets in this series, contact:

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Working Around Water?

WHAT YOU SHOULD KNOW ABOUT FISH HABITAT AND BUILDING MATERIALS

This fact sheet provides information about the use of different building materials for in-water works.

Recently there have been a number of changes in the way proposals for in-water works are reviewed. These changes are outlined in the introductory fact sheet, *Working Around Water? What You Should Know About Fish Habitat*. This introductory fact sheet introduces the entire *Working Around Water?* series of fact sheets that are designed to help in the planning of different types of in-water works.

Be aware of the Fisheries Act and other legislation

The federal Fisheries Act provides for the protection of fish habitat. Under this Act, no one may carry out any work that harmfully alters, disrupts or destroys fish habitat, unless authorized by Fisheries and Oceans Canada. The Act also states that no one is permitted to deposit a deleterious (harmful) substance into water containing fish. Violations can result in substantial fines, the risk of imprisonment and a requirement to cover the costs of returning the site to its original state. Other legislation that may be relevant is outlined in the introductory fact sheet: *Working Around Water? What You Should Know About Fish Habitat*.



This fact sheet provides information for property owners planning to use building materials for construction projects in or around water. Certain materials can adversely affect water quality and are harmful to fish or fish habitat. Others can reduce natural habitat diversity by replacing natural shorelines and substrates with less diverse man-made structures. This fact sheet contains a number of tips for selecting "fish friendly" materials for construction in or around water.

In addition, it is a good idea to talk to local contractors, engineers and building supply outlets to ensure that all aspects of your project are completed properly. Most contractors can usually recommend building materials that are attractive, long-lasting and will not harm fish, fish habitat or water quality.

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Soft structures (Bioengineering)

Bioengineering is an approach to stabilizing exposed soils using natural materials (logs, rocks, live stakes, live brush bundles etc.) in combination with plants.

It is used to stabilize banks and shorelines, enhance habitat and other similar applications. A bioengineered structure has a natural appearance and can provide additional habitat for fish. In general, any approach that uses natural materials such as wood, rocks and shrubs when building structures in or near water is better than hard approaches using materials such as concrete, steel or plastics. Avoid using concrete, steel and plastics to stabilize slopes as these materials provide little habitat for fish and other aquatic organisms.



Uncrushed concrete and refuse do not make good shorelines.

Reused and recycled materials

While efforts to reduce, reuse and recycle materials can generally provide environmental benefits, old materials (e.g. creosote treated railway ties, old metal drums, tires, or car parts) are not recommended for any shoreline or in-water works. These materials are known to release poisons, oils, grease or other chemical substances that are toxic to humans, fish and other forms of wildlife.

Untreated wood

Wood is a common material for docks, swim platforms, etc. It's relatively easy to work with, reasonably priced, and has some "give," allowing it to bend slightly under duress. Types of wood to consider are western red cedar, redwood, cypress, and eastern white cedar (in that order), which all offer reasonable longevity and beauty. These woods have natural preservatives that protect them from the rotting that results from repeated water exposure and air-drying.

For dock cribs and permanent piles, stronger woods, such as Douglas fir, hemlock, and tamarack (in that order) are good choices. Unfortunately, this group is not as resistant to rot as the first. For permanent piles, western larch, pine, and even spruce can be used if fir, hemlock or tamarack is not available.

The standard methods for preserving wood—paint and stain—are not the answer for projects in and around water. For example, any coating put on a dock will fade, blister and peel. These damaged coatings then trap water, creating an ideal spot for wood-destroying fungi. The alternative to scraping and re-coating the dock every few years is to use a preferred wood species and let the wood go naturally grey.

Treated wood

Pressure-treated pine or spruce is considerably less expensive than the preferred decking species, such as cedar, but because the grades of lumber set aside for treatment are usually low, pressure-treated wood is typically more susceptible to warping and cracking when exposed to weather than the preferred untreated species.

Because pressure-treated wood can leach chemicals into the environment, the use of these products should be used with caution and avoided if possible. Working with pressure-treated wood is more difficult, the sawdust is considered toxic, and each cut end must be sealed with an approved preservative. Organic wood preservatives (e.g. creosote, PCP) should not be used on structures placed in or near water. Efforts should be made to buy products that are manufactured according to Best Management Practices (wood products will bear a BMP stamp).

All wood preservatives used today contain compounds that are poisonous to fungi and should be used with care. If you use treated wood or apply preservatives yourself, be sure to read the label carefully and take all precautions suggested by the manufacturer.

Metals

Steel structures are generally not recommended for use in or near water, particularly where they form solid, vertical structures. Solid vertical structures provide little in the way of habitat for fish and other aquatic organisms. In some situations however, they may be the only appropriate material to use. Unpainted steel can rust and detract from the appearance of your shoreline although it has little effect on water quality. Painted steel should be avoided for use in the water because paint flakes can be toxic to aquatic organisms, such as fish. Where metal retaining walls extend below the average annual high-water mark, approvals are required. Contact Fisheries and Oceans Canada and your local Saskatchewan Environment and Resource Management field office. Stainless steel, galvanised steel or bronze fittings are often more expensive than steel, but last longer.



Solid vertical structures provide little in the way of fish habitat.

Concrete

Solid, vertical concrete structures provide little or no habitat for fish and other aquatic organisms and are generally not recommended for use in or near water. However, concrete may be the only appropriate material for use in some situations. If you must use concrete in your structures you will find it difficult to get approvals. It is recommended that you get professional advice during the construction and planning of concrete structures.

If concrete is used for walls in contact with water, watertight forms should be constructed so that concrete is poured into a dry cavity and does not spill into the water. As concrete cures it changes the water chemistry and may result in a fish kill. When it has set, concrete is not harmful to water quality and can be used for structures such as blocks for anchoring floating docks and swimming platforms. Where concrete is covering areas below the average annual high-water mark of any waterbody, approvals are required. Contact Fisheries and Oceans Canada.