
ENVIRONMENTAL Fact Sheet



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Beach Construction – Water Quality Impacts of Dumping Sand

The creation and maintenance of a sandy beach is often an objective that shore-front residents desire along the shoreline of their lake property. Creating a sandy beach, however, can negatively impact water quality and requires permits for sand dumping or replenishing in or around the bank and borders of state waters.

Sand Dumping Regulations

The construction and replenishment of beaches are regulated by the New Hampshire Department of Environmental Services Wetlands Bureau. A wetlands permit or complete permit by notification is required before any sand can be dumped or any work started. Work completed without a permit may result in a removal and restoration order and quite possibly fines. Civil or criminal penalties may apply for repeat offenders.

Physical Impacts

Lakes act as settling basins for surrounding watersheds, collecting and accumulating materials that drain into them. Over long periods of geologic time, as a lake ages, it gradually fills in with sediment. A lake then becomes a marsh and eventually upland. Any activity that adds material to a lake, in addition to the natural supply, will increase the rate of lake filling. The regular addition of sand to a lake or shoreline where it can erode into the lake, accelerates the process.

If a shoreline does not have a natural beach, a constructed beach will probably not remain without sand added over time. The dumped sand will either drift away with shoreline currents or slowly settle through the soft, mucky bottom sediment. Although the sand disappears from view, it does not leave the lake. The sand is added to the natural sediment load to the lake and hastens the filling-in process.

Chemical Impacts

The mineral composition of sand is not consistent. Although clean, washed beach sand is primarily quartz, which is relatively inert, sand can contain other materials. In New Hampshire, iron is a common component of sand and gravel. Iron-rich sand can encourage the growth of [iron bacteria](#), that create rust-colored slime deposits and oil-like films on the sand as they oxidize the iron. Iron bacteria are not a health hazard, but the resulting deposits are aesthetically displeasing.

Sand may also contain contaminants other than iron, all of which have the potential to wash out of the sand and into the water. Clay is a material that, if present in the deposited sand, can cause reduced water clarity, or turbidity, problems in the pond. If [phosphorus](#) is contained in the dumped sand, it will contribute to increased plant growth in the pond, similar to lawn fertilizer.

Biological Impacts

Dumping sand along the shore of a lake can smother bottom dwelling algae and invertebrates, causing a disruption in the food chain of higher organisms including fish. Deposited sand may also destroy spawning or nesting sites for fish. Turbidity from the deposited sand may clog gills and interfere with normal fish behavior.

The physical process of filling-in a lake with deposited sand has two major biological impacts. First, a shallower lake has a lesser volume of water to dilute and assimilate in-coming contaminants, including phosphorus. At a given level of phosphorus loading, a lake's productivity ([algae growth](#)) will increase as the lake's mean depth decreases. Second, as a lake becomes shallower, more of the bottom enters the sun-lit zone and thus the potential for increased rooted plant growth occurs.

Permits for Beach Construction or Maintenance

Recent studies have found beach sand to be a breeding ground for bacteria. Beach sand itself is often more contaminated with bacteria than beach water. Please consider maintaining the natural shoreline on your property. If you find yourself still wanting a sandy beach, please consider a minimum impact perched beach like the one shown.



Local Protection Activities

Local residents and lake association members can help protect a lake from excessive sand dumping by:

- Educating residents, association members, and town officials about the requirement for a state permit to create or enhance a beach, and about the negative impacts of such activities.
- Encouraging association members to minimize the use of sand dumping by adopting an association policy to that effect.
- Working with town officials to adopt a local ordinance to prohibit or restrict the use of sand dumping along lake shores.
- Reporting illegal sand dumping incidents to the DES Wetlands Bureau.

For More Information

For information about obtaining a permit for beach replenishment or the construction of a perched beach, contact the DES Wetlands Bureau at (603) 271-2147 or wetmail@des.nh.gov. For information about sand dumping and beach construction, contact the DES Limnology Center at (603) 271-4793.