Zebra Mussel *(Dreissena polymorpha* (Pallas, 1771)

The zebra mussel, *Dreissena polymorpha*, was originally described by the famous Russian scientist and explorer Pyotr Simon Pallas from a population in a tributary of the Ural River in the Caspian Sea Basin (Pallas 1771). The common name of these mussels is derived from the zebra-like stripes on their shells. Once adult mussels (sexually mature) are attached to a substrate by their byssal threads, they generally remain there for life; this is particularly true for larger mussels.

Aided by the expansion of commercial boat traffic through newly constructed canals, this species spread west from Russia into most of Europe during the 19th century. Zebra mussels were found for the first time in North America in 1988 in Lake St. Clair - the waterbody connecting Lake Huron with Lake Erie (Hebert et al. 1989). Estimated to be 2-3 years old, they were likely transported there as planktonic (i.e., floating) larvae or as attached juveniles or adults in the freshwater ballast of a transatlantic ship. Since their introduction, zebra mussels have spread throughout all the Great Lakes, the Hudson, Ohio, Illinois, Tennessee, Mississippi and Arkansas rivers, as well as other streams, lakes and rivers, which altogether cross 21 states and the provinces of Quebec and Ontario.

The zebra mussel has become the most serious non-indigenous biofouling pest ever to be introduced into North American freshwater systems. It has the ability to tolerate a wide range of conditions and is extremely adaptable. It has the potential to significantly alter the ecosystem in any body of water it inhabits. To facilities that depend upon water intake, zebra mussel fouling can have a serious economic impact. Industry and utility plants have experienced clogged or blocked intakes, clogged or blocked distribution piping throughout the facilities, an increase in the corrosion of iron or steel piping and riveting, as well as the fouling of pumps, forbays, and holding tanks, trash-racks, and condenser units. Boaters and recreational facilities experienced the fouling of boat hulls and engines, heavy fouling of navigational buoys, which rendered many of them useless, the accumulation of windrows of mussel shells along beaches and shorelines and the encrusting of docks and gear with colonizing mussels. Ecologists and biologists have recognized the potential for the alteration and destruction of existing habitats, elimination or decline of various indigenous species, and changes in water quality due to infestations of zebra mussels.

There are many ways that zebra mussels are able to spread from place to place. There are naturally occurring vectors of dispersal and there are human-mediated means. Human-mediated means of dispersal tend to occur on a larger scale and over a longer period of time. If a boat has been in an infested body of water, it may have adult mussels attached to it. Mussels may be on the bottom, in the intake pipes for the engines, in the bilges, or on any other surface that is wet and comes into contact with raw lake water. Once the boat is transported to an uninfected body of water, the mussels may migrate off the boat and into the new habitat. Even if adult mussels are not visible on a boat or other piece of equipment that has been in contact with infected water, very small juvenile mussels (1-3 mm) may be attached. Any exchanges of water between an infected area and an uninfected area (i.e., ballast exchange, pumping of bilge or pumps, bait buckets) can potentially transfer larval mussels. It's a good idea to rinse any equipment thoroughly with fresh water when leaving an infected area.

Additionally, adult zebra mussels will settle on and colonize submerged aquatic plants. If plants are transported from an infected lake to an uninfected body of water, it is likely that adult zebra mussels may well be transported, too. Some possible means of unintentional transport include plants attached to boat trailers and plants in or on bait buckets or other fishing gear. Larval zebra mussels are free-swimming, microscopic, and planktonic. These factors contribute to their rapid spread. Any body of water downstream of an infected area has a high probability of being infected if there is continuous water flow from the upstream area. Migrating waterfowl may carry larval or juvenile mussels in their feathers or on their feet, but it is highly unlikely that they disperse mussels from one waterbody to another. Crustaceans (such as crayfish) can be the site of zebra mussel settlement. If they are moved from an infected area to an uninfected area after settlement, but prior to their molting event, it is possible that they could transport mussels.

Information courtesy of the Zebra Mussel Information System (http://el.erdc.usace.army.mil/zebra/zmis/cdinfo.html)