

Development of a Selenium Standard for the Open Waters of Great Salt Lake

Great Salt Lake Water Quality Studies

Science Panel Recommended Guidelines

1. Laboratory studies with mallards provide the best available data for relating bird exposure and effects of selenium and will be used to set the basis for the Water Quality Standard.
2. A selenium water quality standard that prevents impairment for aquatic wildlife of Great Salt Lake lies within the following range: 6.4 – 16 mg Se/kg for bird eggs.
3. Corresponding waterborne and diet selenium concentrations will be back-calculated using the Bioaccumulation Model.

Mallards do not use the open waters of Great Salt Lake; so why is mallard toxicity data being used to develop a water quality standard for Great Salt Lake?

Best Data Available

Best available data that links egg selenium concentrations to reproductive success is from six laboratory studies that used mallards, a species of duck. This data was summarized by Ohlendorf 2003.



Build Conservatism into the Water Quality Standard

Mallard data provides a conservative basis, or a safety factor, for the water quality standard.

1. Mallards as a species are more sensitive to selenium than other bird species that commonly nest on Great Salt Lake.
2. Field studies show that birds that typically use saline, or salt-water, non-marine habitats (e.g., avocets and snowy plovers) seem to be less sensitive than closely related species typical of freshwater habitat (e.g., stilts and killdeer); USDI NIWQP. Mallards are a freshwater species, thus a more conservative species to use.
3. The laboratory studies used a form of selenium in the diets of the mallards that is “absorbed” by the mallards easier than what is found in Great Salt Lake. Selenium uptake by birds on Great Salt Lake would be expected to be less than represented by mallard studies.

