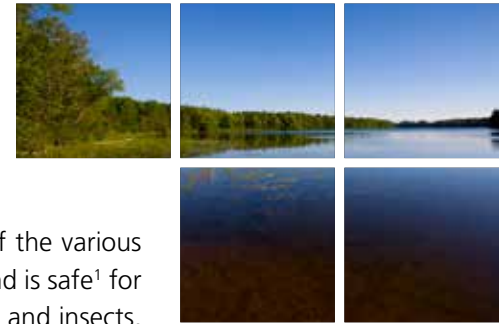


This document provides a listing of the toxicology studies that have been conducted with Zequanox® for the purpose of ensuring its selectivity to zebra and quagga mussels (*Dreissena* species). The studies were performed, or are being performed, by Marrone Bio Innovations, certified contracted laboratories, and a number of research organizations, including New York State Museum and the U.S. Geological Survey. To date the findings of the various studies demonstrate that Zequanox is highly selective towards zebra and quagga mussels and is safe<sup>1</sup> for many aquatic species, including fish, native freshwater unionids, plants, algae, crustaceans, and insects, as well as, mallard ducks. In addition, the U.S. EPA described the active ingredient in Zequanox as follows, “*Pseudomonas fluorescens* strain CL145A (Zequanox) has low toxicity and presents little risk to non-target organisms” [U.S. EPA Biopesticide Registration Action Document (BRAD) July 29, 2011].



## FISH

Bluegill Sunfish (*Lepomis macrochirus*)<sup>3</sup>

Channel Catfish (*Ictalurus punctatus*)<sup>3</sup>

Chinook Salmon (*Oncorhynchus tshawytscha*)<sup>4</sup>

Coaster Brook Trout (*Salvelinus fontinalis*)<sup>3</sup>

Common Carp (*Cyprinus carpio*)<sup>5</sup>

Fathead Minnow (*Pimephales promelas*)<sup>3, 4, 5</sup>

Klamath Suckers (*Catostomus sucker spp*)<sup>4</sup>

Lake Sturgeon (*Acipenser fulvescens*)<sup>3</sup>



Largemouth Bass (*Micropterus salmoides*)<sup>3</sup>

Rainbow Trout (*Oncorhynchus mykiss*)<sup>3, 5</sup>

Sacramento Splittail (*Pogonichthys macrolepidotus*)<sup>4</sup>

Smallmouth Bass (*Micropterus dolomieu*)<sup>3</sup>

Striped Bass (*Morone saxatilis*)<sup>4</sup>

Walleye (*Sander vitreus*)<sup>3</sup>

Yellow Perch (*Perca flavescens*)<sup>3</sup>

## MOLLUSCS

Blue Mussel (*Mytilus edulis*)<sup>2, 5</sup>

Freshwater Mussel - Duck Mussel (*Anadonta*)<sup>2</sup>

Freshwater Mussel - Black Sandshell (*Ligumia recta*)<sup>3</sup>

Freshwater Mussel - Fatmucket (*Lampsilis siliquoidea*)<sup>3, 6</sup>

Freshwater Mussel - Pink mucket (*Lampsilis abrupta*)<sup>5, 6</sup>

Freshwater Mussel - Hickorynut (*Obovaria olivaria*)<sup>3</sup>

Freshwater Mussel - Higgins Eye (*Lampsilis higginsii*)<sup>3</sup>



Freshwater Mussel - Mucket (*Actinonaias ligamentina*)<sup>3</sup>

Freshwater Mussel - Plain Pocketbook (*Lampsilis cardium*)<sup>3</sup>

Freshwater Mussel - Washboard (*Megalonaias nervosa*)<sup>3, 6</sup>

Freshwater Mussel - Western Pearlshell (*Margaritifera falcata*)<sup>6</sup>

Freshwater Snail (*Lymnaea peregra*)<sup>2</sup>

<sup>1</sup> At application rates that produced high zebra mussel mortality (76%–100%), no bacteria-induced mortality was recorded among any of the nontargets.

<sup>2</sup> Study performed by Institute of Technology, Sligo, Ireland.

<sup>3</sup> Study performed by NYSM and USGS; to be completed in 2014.

<sup>4</sup> Study performed by U.S. Bureau of Reclamation.

<sup>5</sup> Study performed by a Certified Good Laboratory Practices (GLP) Lab.

<sup>6</sup> Study performed by Missouri State University.



## PLANTS AND ALGAE

Algae <sup>2</sup>

Bindweed (*Convolvulaceae*) <sup>3</sup>

Common Water Plantain (*Alisma subcordatum*) <sup>3</sup>

Curly Dock (*Rumex crispus*) <sup>3</sup>



Mallow (*Malvaceae*) <sup>3</sup>

Nightshade (*Solanaceae*) <sup>3</sup>

Smallflower Umbrella Sedge (*Cyperus difformis*) <sup>3</sup>

## OTHER

Mallard Duck <sup>2</sup>

Midge (*Chironomidae*) <sup>1</sup>

Mayfly (*Baetis*) <sup>1</sup>

Amphipod (*Hyaella azteca*) <sup>2</sup>



European Freshwater Crayfish (*Austropotamobius pallipes*) <sup>1</sup>

Freshwater Crustacean (*Asellus aquaticus*) <sup>1</sup>

Freshwater Water Flea (*Daphnia magna*) <sup>2</sup>



<sup>1</sup> Study performed by Institute of Technology, Sligo, Ireland.

<sup>2</sup> Study performed by Certified Good Laboratory Practices (GLP) Lab.

<sup>3</sup> Study performed by MBI.