

Zebra & Quagga Mussel Research Program

RESEARCH NOTE

Investigations to Assess Fish Predation on Quagga Mussels

Background

Quagga mussels are now widespread in Lakes Mead, Mohave and Havasu and other lakes in the lower reaches of the Colorado River system where they threaten water related resources and facilities. Several fish species have been observed to consume zebra mussels in the Eastern U.S. (Malloy, *et al.*, 1997) and a number of previously introduced resident species to the Colorado River system are known to feed on these invasive mussels including redear sunfish, bluegill sunfish, channel catfish, and red swamp crayfish all from the Eastern U.S. and common carp from Eurasia. Redear sunfish are present in the river below Davis Dam, but not in Lakes Mead and Mohave. These studies are a preliminary assessment of the potential for resident fish and crayfish predation on quagga mussels in the Southwestern U.S.

Project Description

Laboratory studies with redear and bluegill sunfish confined in aquaria with quagga mussels at Reclamation's Multi Species Conservation Program (MSCP) fish laboratory in Boulder City, Nevada began in 2009. Parallel field studies looking at stomach contents of captured fish are also being conducted to further evaluate resident fish predation on quaggas.

Preliminary Findings

During laboratory studies, single fish (123mm – 300mm length) were confined for 48 hours in 10 gallon aquaria with 20 quagga mussels ranging from 3.6mm – 24.9mm (length). Of 24 fish tested, 83.3% consumed mussels with some indication of size preference (Pearson correlation coefficient $r = 0.7$, $P = 0.0003$). Most of the consumed mussels were crushed and shell fragments were regurgitated or retained in the fish's digestive tract. No damage to the digestive tract due to mussel consumption was observed. Feeding behavior of redear and blue gill sunfish on quagga mussels was also recorded using video. During field studies, mussels were found in the stomachs of redear and bluegill sunfish, common carp, and channel catfish from Lakes Havasu and Mohave.

Future Direction

Reclamation plans to continue studies on predation, including tests to determine whether quagga mussels are a preferred food source. Field enclosure studies are also scheduled to begin in 2011 to evaluate the potential for predators to reduce quagga mussel densities. Studies will take place only in areas where mussels and predatory species already exist.



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