COMPARISON OF MORTALITY RATES OF HATCHERY-REARED AND WILD JUVENILE QUEEN CONCH IN NATURAL HABITATS

L. S. MARSHALL JR.,
R. N. LIPCIUS,
and
C. COX

[Converted to electronic format by Damon J. Gomez (NOAA/RSMAS) in 2003. Copy available at the NOAA Miami Regional Library. Minor editorial changes were made.]

COMPARISON OF MORTALITY RATES OF HATCHERY-REARED AND WILD JUVENILE QUEEN CONCH IN NATURAL HABITATS

L.S. MARSHALL, JR., R.N. LIPCIUS AND C. COX

Caribbean Marine Research Center
Lee Stocking Island, Exuma Cays, Bahamas
and
The College of William and Mary
Virginia Institute of Marine Science
Gloucester Point, Virginia 23062

Progress Report

During the past decade, efforts to enhance natural populations of *Strombus gigas* by transplanting hatchery-reared conch into the field has received much attention. Chief among the factors to be considered in making such efforts successful are the placement of transplanted animals into the appropriate microhabitats and an increased understanding of the activities of key queen conch predators.

Recent reports indicate that release of hatchery-reared animals into the wild is not a viable strategy. However, experimental tests of such hypotheses are non-existent. Thus we provide the first manipulative experimental test of the utility of releasing hatchery-reared animals in nature.

Specifically, we tested the hypothesis that hatchery-reared and wild juvenile conch exhibit different predation-induced mortality rates in nature. Field experiments were conducted in two different seagrass beds (one with and one without resident conch) at Lee Stocking Island, Exuma Cays, Bahamas. Hatchery-reared and wild juvenile conch ranging in size from 60-80 mm in shell length were tethered during the late summer through early fall, 1988.

Results of statistical analyses on data collected to date indicate the following:

(1) A significant difference in proportional mortalities between experimental sites, with proportional mortality rates in the seagrass site without a natural conch population showing the highest predation-induced mortality rates.

(2) A significant difference in stock type, with hatchery-reared juveniles experiencing slightly higher proportional mortality rates than

wild juveniles,

(3) Both hatchery-reared and wild juveniles appeared to exhibit generally higher proportional mortality rates compared to those observed for 80-100 mm shell length wild juveniles (from tethering experiments during summer 1987 and 1988). High rates of predation-induced mortalities for hatchery-reared and wild juveniles (60-80 mm shell length) also appeared to extend well beyond the end of the summer high-intensity predation period, and

(4) Dominant benthic predators on this particular size range of hatchery-reared and wild juveniles appear to be hermit crabs, apple murex and the tulip snail. Infrequently observed crushed shells also suggests the presence of pelagic and epibenthic predators such as turtles, rays, sharks and spiny lobster.

Interpretation of the above results does suggest that hatchery-reared animals are slightly more susceptible to predation-induced mortalities in nature than wild animals. However, the specific habitat type into which hatchery-reared animals are outplanted is important. Our data suggest that hatchery-reared survival is increased when these animals are outplanted into moderate to low density seagrass beds containing resident conch populations. More importantly, our findings suggest that hatchery-reared animals can be used to enhance depleted conch populations in nature.