

Florida Integrated Science Center

## Publication Brief for Resource Managers

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# Black Salty: Implications of survival of non-native live salt-water bait

Nonindigenous species are a major concern in aquatic habitats across the country. Once introduced into an area, they may become established, move between ecosystems, and compete with or consume native species. But what are the limits to movement and species success? Schofield, Brown and Fuller examined salinity conditions that may limit survival of goldfish (*Carassius auratus*) which are native to East and Central Asia. Goldfish have a wide diet that includes vegetation, plankton, crustacean, insects, mollusks and small fishes. Additionally, the species can be found in a variety of habitats such as lakes, ponds, streams, swamps, and floodplains. The black salty is a variety of goldfish that was developed and marketed for sale as salt-water live bait in the United States. The purpose of Schofield et al.'s laboratory experiment was to determine whether the goldfish could potentially expand into low-salinity (brackish-water) areas, and if the black salty is actually more salt tolerant.

Schofield et al. conducted laboratory trials to determine levels of acute and chronic salinity tolerance for both the black salty and standard goldfish. Acute salinity trials were nearly equivalent between black saltys and standard goldfish. Fish were transferred from fresh-water to one of six treatments (salinities of 5, 10, 15, 20, 25, and the 0.2 ppt control). Both goldfish varieties showed good survival over the 72-hour trial at salinities up to 15 ppt; however, when fish were transferred to salinities of 20 and 25 ppt, all individuals were dead within 8 hrs. Chronic trials exposed both varieties to progressively increasing salinity of 2 ppt every 2-3 days, until target salinities (5, 10, 15 and 20 ppt) were reached. Both varieties exhibited very good survival

### Management Implications:

- The black salty is simply a variety of goldfish. Goldfish are non-native fishes from Asia that can disrupt natural habitats by interfering with feeding and reproduction of native fishes. Non-native fishes may compete with the young of game species that use estuaries as nurseries. Once a population of non-native fish is introduced and reproducing in a natural habitat, they are very difficult or impossible to eliminate.
- Many unwanted introductions of non-native fishes have occurred by their use as live bait. Goldfish can tolerate low salinities ( $\leq 10$  ppt) for extended periods. Thus using any variety of goldfish as a live bait in brackish-water or estuarine habitats may pose a threat of accidental introduction.
- The ability of the goldfish to persist at low levels of salinity indicates that it may be able to invade estuarine areas, and gain access to new river systems.

for at least 30 days at salinities up to 10 ppt. However, at 15 ppt survival was much lower over the 30-day period (black salty: 11%; standard goldfish: 8%).

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*Schofield, P.J., M.E. Brown, P.L. Fuller. (2006). Salinity tolerance of goldfish Carissius auratus L., a non-native fish in the United States. Florida Scientist 69(4) 258-268.*

