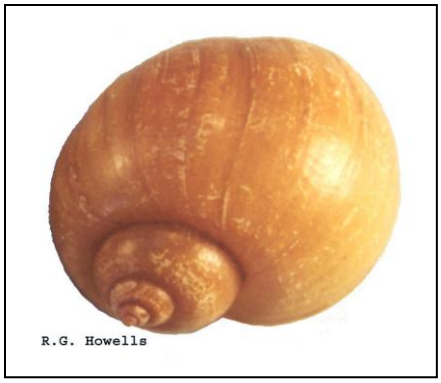
CHANNELED APPLESNAILS:
Recommendations to Prevent Their Spread



Channeled applesnail and some relatives can grow to the size of a baseball and display a variety of different banding patterns.

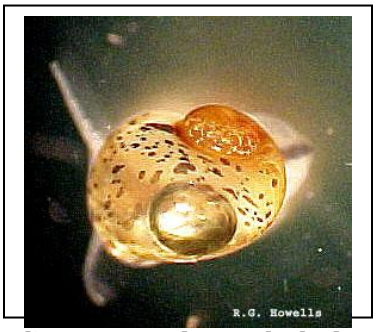
OVERVIEW: Channeled applesnails (*Pomacea canaliculata* and apparently several related species) have invaded the Indo-Pacific from Hawaii to Southeast Asia since about 1979 and have caused massive damage to rice and taro crops. Applesnails with channeled shells have also been illegally released in Texas and now occur in at least six southeastern counties (Brazoria, Chambers, Fort Bend, Harris, Galveston, and Waller) and in the Fort Worth area (Tarrant County). These baseball-sized (4-6 inches in diameter) snails from South America display different color and banding patterns. They consume both aquatic and terrestrial plants, and pose major threats to aquatic and wetland ecosystems, as well as some agricultural crops. They can also carry harmful parasites, some of which can infect humans. Adult snails are large and easily recognized. They can burrow into soft mud to hide or avoid excessive heat and cold. Applesnails have a trap door (operculum) that protects the opening to their shells when they withdraw. They lay easily-recognized, bright pink egg masses on solid objects above the water line. However, hatchlings are only about 1/25th inch (1 mm) in diameter, are relatively transparent, and can be easily overlooked. Because of the potential threats these snails pose, efforts should be made to avoid transporting them to new locations.

Adults, juveniles, and egg masses, may be present on boats, equipment, and vegetation, but are usually large enough to be seen and removed. However, tiny hatchlings may occur on mud on boots or equipment, among wet nets and ropes, aquatic vegetation and trash tangled on gear and boat trailers, water-holding areas in boat bilges and cooling systems, in bait buckets and live wells, within dead mollusk shells, and even on trash gathered during waterbody clean-up efforts.

TO PREVENT SPREAD OF APPLESNAILS: Thus far, no guidelines have been established regarding the best methods to avoid transporting applesnails to other waters. Some methods used in waters containing zebra mussels should be helpful against applesnails as well. These include:

1) Visually inspect and remove larger snails and eggs from boats, trailers, nets, and other gear.
2) Remove mud, vegetation, and trash from equipment that has been in or near water inhabited by applesnails.
3) Drain water-holding bilges, live-wells, bait buckets, pumps, and cooling systems.
4) Use high-pressure, hot-water (140^{o} F) washes to clean boats, trailers, and equipment.
5) Dry equipment (especially in the sun) for several days before using in uncontaminated waters.

OTHER METHODS TO CONSIDER: Several possible approaches have not been examined, including: Soaking in a concentrated table salt (sodium chloride) solution for several hours or days may help destroy unwanted snails. Additionally, soaking in copper sulfate or copper acetate solutions (0.1-2.0 ppt) may also be useful. Note that while copper has not been registered for use against snails, use for algae control is permitted, suggesting a significantly reduced environmental impact over many pesticides. Grapefruit seed extract used in organic gardening may have some value against applesnails as well. Note that because applesnails are able to use their trap doors to seal themselves within their shells for extended periods and exposure times needed to eliminate applesnails remain unstudied. Soaking or washing equipment in strong bleach solutions can certainly help eliminate applesnails, but safely and legally disposing of the bleach-water itself can become an environmental problem. Similarly, a number of pesticides can be used against applesnails, but, in addition to cost, also create disposal and environmental contamination problems.



Pink egg masses are easily recognized, but tiny hatchlings at 1/25 inch (1 mm) in diameter may be overlooked.

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