

## Marsh Periwinkle

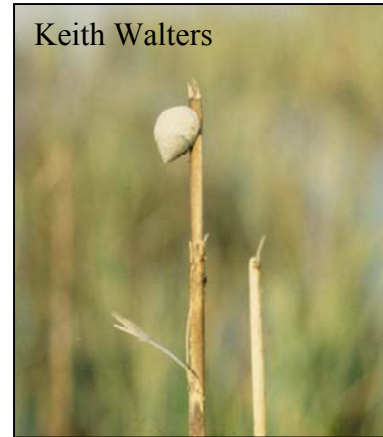
*Littoraria irrorata*

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### DESCRIPTION

#### Taxonomy and Basic Description

The marsh periwinkle was first described in the United States by Say in 1822 from specimens collected along the Atlantic shoreline (Say 1822). This gastropod, in the order Mesogastropoda, belongs to an important genus of common marsh snails. They can reach a size up to 30 mm (1.25 inches) in total length. Individual snails are hermaphroditic and capable of reproduction throughout the summer. In South Carolina, maximum settlement of young typically occurs in early to late spring with shell growth to maximum length taking approximately two to three years. Adult snails can range in color from dark brown to an almost bleached white.

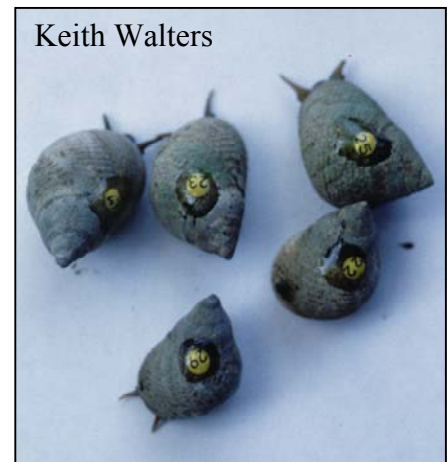


#### Status

Although the marsh periwinkle is not a threatened or endangered species, it is an important component of the intertidal salt marsh community. Periwinkles may be a major participant in the decomposition of cordgrass, *Spartina alterniflora*, leaves (Bärlocher and Newell 1994; Silliman and Newell 2003) through a mutualistic association with leaf fungi (Silliman and Newell 2003). Marsh periwinkle can serve as an indicator species of the health of salt marsh habitat, a type that is critical for many species of marine invertebrates and migratory birds.

### POPULATION DISTRIBUTION AND SIZE

The marsh periwinkle is distributed from New England to the Gulf Coast of Texas. In South Carolina, it can be found within vegetated landscapes, from the low water line all the way to the terrestrial scrub community in most estuarine salt marshes. Although it is an apparently abundant and common species (pers. obs), little is known in South Carolina regarding long-term population trends and related information. Seasonal densities in the mid-marsh can range from 50 to 300 individuals per square meter, with greater densities observed during winter months (pers. obs.).



### HABITAT AND NATURAL COMMUNITY REQUIREMENTS

The marsh periwinkle is an obligate salt marsh resident in which cordgrass may be considered a critical habitat. Individuals can be found inhabiting high-marsh areas around freshwater seeps and low-marsh stems submerged in full strength seawater (greater than 25 parts per thousand). Short-term studies (less than 2 years) indicate densities within the low marsh zone tend to be lower (less than 100 per square meter) compared to mid-marsh elevations (over 300 per square

meter). Snails are also commonly found above the high water line on the stems of marsh plants; evidence suggests this climbing behavior is in response to blue crab predators (Hamilton 1976; Vaughn and Fisher 1992). Marsh periwinkles feed on microalgae and detritus; they may also graze and consume fungal decomposers found on the surface of marsh plants (Silliman and Newell 2003).

## CHALLENGES

Major challenges to conservation of the salt marsh periwinkle include the loss of habitat and dramatic alterations to predator populations. Recently, marsh periwinkle has been implicated as a critical consumer of cordgrass and increased snail densities may be responsible for observed declines in intertidal cordgrass coverage (Silliman and Bertness 2002). Increased marsh periwinkle densities are attributed to reductions in a major predator, the blue crab, *Callinectes sapidus* (Silliman and Bertness 2002). Reductions in marsh acreage or quality will also affect snail foraging and survival. Snails appear to have an obligatory relationship with cordgrass and the loss of cordgrass habitat would suggest a negative effect on snail populations. However, snails also appear to have a reciprocal negative effect on cordgrass in the absence of “natural densities” of predators. The cause of what appears to be an out of balance predator/prey dynamic between blue crabs and marsh periwinkle needs to be determined.

## CONSERVATION ACCOMPLISHMENTS

The marsh periwinkle has received little or no attention in terms of past conservation efforts, likely in part because of the species ubiquitous distribution within coastal salt marshes.

## CONSERVATION RECOMMENDATIONS

- Further investigate the theory of top-down regulation of cordgrass biomass by marsh periwinkle.
- Determine whether blue crab predation is capable of regulating the distribution and abundance of periwinkles.
- Determine the preferred food(s) of marsh periwinkles.
- Determine whether recruitment is responsible for the initial distribution and abundance of marsh periwinkle in the marsh.
- Determine dispersing capabilities of marsh periwinkle.
- Determine whether cordgrass characteristics and/or environmental conditions determine snail consumption.
- Determine the fraction of the overall productivity of a marsh that is processed by snails.
- Determine the role of marsh periwinkle in observed declines of cordgrass.
- Determine factors other than predation and cordgrass quality that may account for the patchy distribution of marsh periwinkle in the field.

## MEASURES OF SUCCESS

A better understanding of the role of cordgrass/marsh periwinkle/blue crab dynamics is one measure of success. Conservation of blue crab populations would presumably restore balance to the salt marsh systems, which would be another measure of success.

## LITERATURE CITED

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