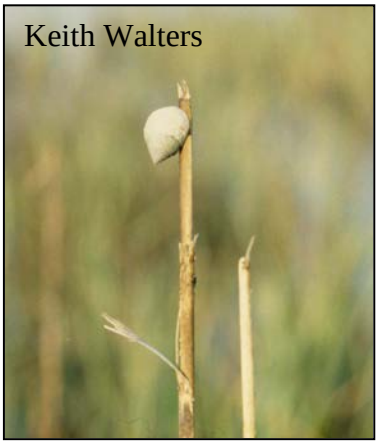
Marsh Periwinkle
Littoraria irrorata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DESCRIPTION

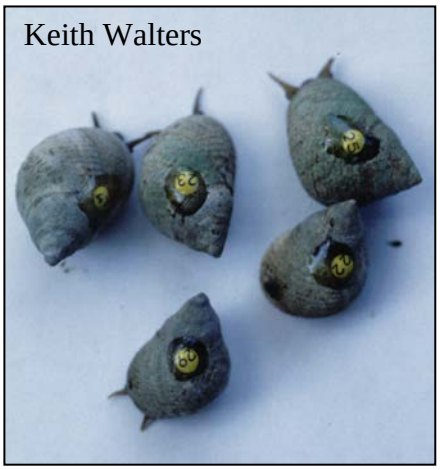
Taxonomy and Basic Description

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 of up to 30 mm (1.25 in.) in shell height. 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 2 to 3 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 periwinkles can serve as an indicator species of the health of saltmarsh habitat, a type that is critical for many species of marine invertebrates and migratory birds.

POPULATION SIZE AND DISTRIBUTION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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 up to the terrestrial scrub community in most estuarine saltmarshes. Although it is an abundant and common species, 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 m^2 with greater densities observed during winter months.

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

The marsh periwinkle is an obligate saltmarsh 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 or ppt). Short-term studies (less than 2 years) indicate densities within the low marsh zone tend to be lower (less than 100 per m^2) compared to mid-marsh elevations (over 300 per m^2). 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 garden and consume fungal decomposers found on the surface of marsh plants (Silliman and Newell 2003).

CHALLENGES

Major challenges to the conservation of saltmarsh periwinkle populations include the loss of habitat and dramatic alterations to predator populations. Recently, the marsh periwinkle has been implicated as a critical consumer of cordgrass and increased snail densities may be responsible for observed declines in intertidal cordgrass, (*Spartina alterniflora*) coverage (Silliman and Bertness 2002). Increased marsh periwinkle densities are attributed to reductions in a major predator, the blue crab (*Calinectes sapidus*) (Silliman and Bertness 2002). Reductions in marsh acreage or quality will also affect snail foraging and survival. Periwinkles appear to have an obligatory relationship with *S. alterniflora*, and the loss of *S. alterniflora* habitat would suggest a negative effect on snail populations. Periwinkles, however, also appear to have a reciprocal negative effect on *S. alterniflora* 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 the 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 ubiquitous distribution of this species within coastal saltmarshes.

CONSERVATION RECOMMENDATIONS

- Further investigate the theory of top-down regulation of *Spartina alterniflora* biomass by the 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 periwinkles.
- Determine the dispersal capabilities of the marsh periwinkle.
- Determine whether *Spartina alterniflora* characteristics and/or environmental conditions determine diet preferences of the marsh periwinkle.
- Determine the fraction of the overall productivity of a marsh that is processed by marsh periwinkles.
- Determine the role of the marsh periwinkle in observed declines of *Spartina alterniflora*.
- Determine factors other than predation and *Spartina alterniflora* quality that may account for the naturally patchy distribution of the marsh periwinkle.

MEASURES OF SUCCESS

A better understanding 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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