Mute Swan Impact on Chesapeake Bay Grasses

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A mute swan fitted with a customized GPS PTT just after release

Native to Europe and Asia, mute swans were transported to North America in the late-nineteenth century by European immigrants for display on estates. Some mute swans eventually escaped, while others were deliberately released into the wild. Maryland's current population of about 3,600 birds was established when five swans escaped captivity along the Miles River during a storm in 1962. During the 1970s and early 1980s the population grew slowly, remaining at less than 500 birds. When the population rapidly increased in numbers and greatly expanded its range during the late 1980s and 1990s, their ecological impacts began to surface (Figure 1).

Submerged aquatic vegetation (SAV) or "bay grasses" have long been recognized as critical to the health and well being of myriad Chesapeake Bay organisms. Not only does this SAV protect water quality and prevent erosion, it also provides food and shelter for fish, shellfish, invertebrates and waterfowl. For example, research has shown that the density of juvenile blue crabs is 30 times greater in SAV beds than in unvegetated areas of the Bay. However, today only about 10 percent of the historic levels of SAV beds remain. Although the primary cause of SAV decline has been attributed to elevated levels of nutrients and sedimentation, shoreline property owners and resource managers are also increasingly troubled by the mute swan population's impact on SAV.

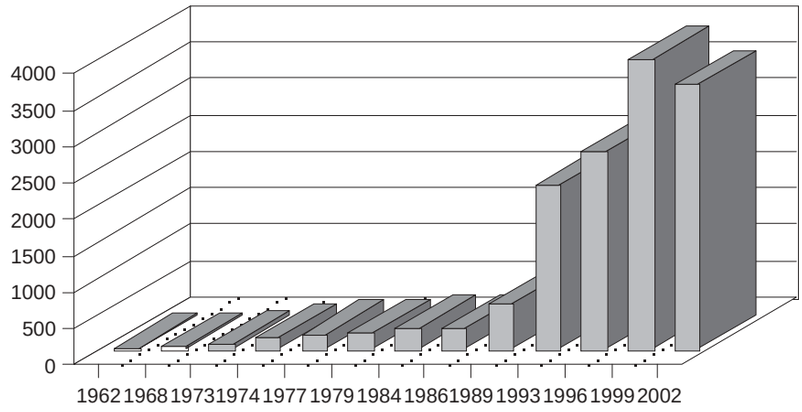

Fig. 1. Number of Mute swans in Maryland 1962-2002

Mute swans feed extensively on SAV, such as widgeon grass and eelgrass. Each bird consumes about eight pounds of SAV each day, accounting for the removal of about 10.5 million pounds of valuable bay grasses each year. Mute swans also feed on SAV during the plants' reproduction cycle, interrupting seed production and dispersal. At high densities, mute swans overgraze an entire area, leaving the Bay's bottom completely barren. Mute swan grazing reduces the amount of SAV in the Chesapeake Bay, thus reducing the Bay's capacity to support healthy wintering waterfowl populations that also use SAV. In fact, several wintering duck populations including redhead, canvasback, American widgeon, and black ducks have declined in Maryland's portion of Chesapeake Bay region attributed, in part, to the reduced availability of SAV.

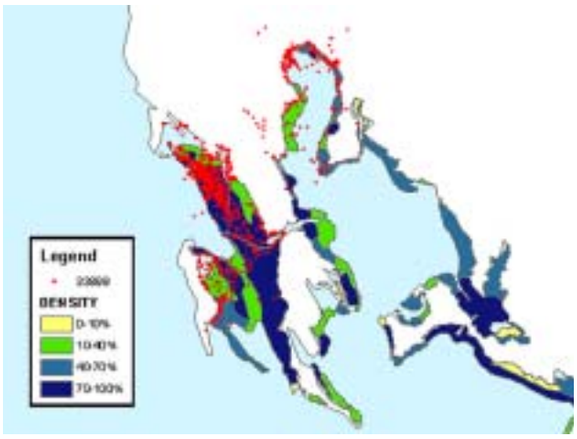

Fig. 2. GPS locations of a mute swan's movement overtop bay grass beds in the Hooper Island area of Maryland's Eastern Shore. The legend indicates density of SAV vegetation.

Photos courtesy of Larry Hindman

Rich Malecki, with the USGS Wildlife Research Unit in New York, attaches a special GPS transmitter on an adult mute swan.

Many questions regarding the ecological impacts of mute swans on SAV remain unanswered. It is clear that a large mute swan population is incompatible with native wildlife and SAV resources in Chesapeake Bay. To increase the understanding of mute swan impacts on SAV, movements of a small sample of male swans (members of large nonbreeding swan flocks that concentrate on large SAV beds) are being tracked using unique GPS satellite transmitters attached to the swans. The GPS satellite transmitters provide an exact location of the marked swans 24/7. Preliminary movement information gathered during the fall and winter of 2002/2003 demonstrates that swans spend nearly all their time in areas where bay grasses occur (Figure 2). This study will be expanded in the coming months and the new information gained from the use of this technology will aid wildlife managers to better understand the daily and seasonal movements of swans in relationship to SAV resources, water depth, and salinity. ❖

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