Key Site 82: Upper Chesapeake Bay, Maryland

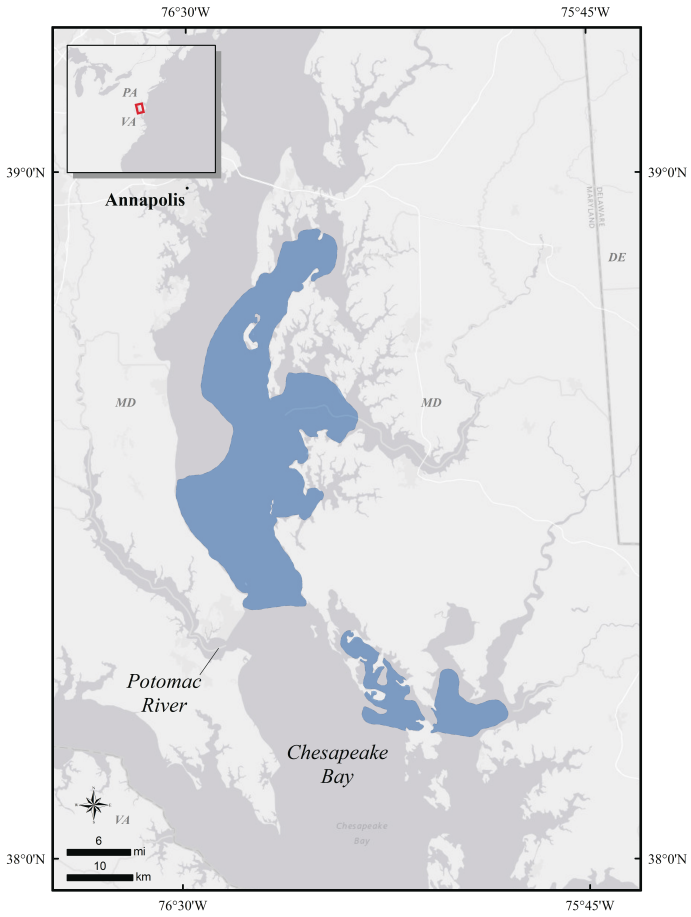
Location: 38°34'14"N, 76°21'29"W

Size: 963 km^2

Description: Chesapeake Bay is the largest estuary in the United States and the third largest in the world. It is more than 320 km long, stretching from Havre de Grace, Maryland, to Virginia Beach, Virginia (Schubel and Pritchard 1986). The bay can be subdivided into upper and lower Chesapeake Bay, because benthic communities and salinity regimes differ substantially. The upper portion of the Bay is located within Maryland and stretches to approximately the confluence of the Potomac River (Schubel and Pritchard 1986). Large islands such as Hart-Miller Island, Pooles Island, and Kent Island dot the upper reaches of the bay. The bay is relatively shallow with an average depth of 6.46 m. Annapolis, a major port city and a naval shipyard, is located on the western bank of the upper bay. The bay is fed by three large rivers: the Susquehanna, Potomac, and James, which provide more than 80% of the fresh water to the bay. This is a highly populated area, with major cities such as Washington, D.C., and Baltimore, Maryland, lying within the watershed. Salinities range from 0 to 15 ppt in the upper bay where many eelgrass beds are found. Average water temperatures in the bay range from a mean of 4°C in the winter to a mean of 24°C in the summer.

Precision and Correction of Abundance Estimates Presented: Abundance estimates are based on data from the Atlantic Coast Wintering Sea Duck Survey (see Silverman et al. 2012 for methods; also see Methods section in this atlas) and related surveys (Mid-Winter Survey [MWS; Eggeman and Johnson 1989] or Atlantic Marine Assessment Program for Protected Species [AMAPPS 2015]). Abundance estimates presented for this key habitat site have not been adjusted to account for incomplete detection or other biases. Abundance estimates should, therefore, be treated as minimum estimates.

Biological Value: Extensive grass beds (e.g., eelgrass) support a huge diversity of bivalves and crustaceans (Seitz et al. 2006), which are an important food source for scoters (*Melanitta* spp.) and Long-tailed Ducks (*Clangula hyemalis*) (Cottam 1939). Millions of waterfowl use the Chesapeake Bay as



their migration stopover and wintering site; the most prominent sea duck species are scoters and Long-tailed Duck. Silverman et al. (2012; see Methods section in this atlas) estimated a minimum of 19,300 sea ducks, including 4400 wintering scoters and more than 5000 wintering Long-tailed Ducks in the upper reaches of the bay. Eastern Bay, the lower Choptank and Nanticoke Rivers, and Fishing Bay are especially important to sea ducks at this site.

Sensitivities: Chesapeake Bay is a major commercial shipping and naval cruiser waterway. Heavy commercial traffic can disturb local wildlife and their habitats. Areas around Chesapeake Bay are highly populated, and the expansion of urban landscapes increases incidents of pollution, nutrient runoff, and sedimentation in the bay. Eutrophication can be a serious problem with adverse effects on fisheries and oyster reefs (Kemp et al. 2005). Climate change may also have drastic impacts on the health of the bay. Extensive tidal marshes, which have served as effective nutrient buffers along the bay margins, are now being lost with rising sea level. In addition, in drier

years the decreased inflow of fresh water from rivers can drastically alter the salinity gradients, causing a decline in certain species of submerged aquatic vegetation (Kemp et al. 2004). Warming water temperatures can cause massive die-offs of eelgrass beds and oyster reefs (Cook et al. 1998). Introduction of invasive species such as zebra mussels is also more common as this is a high-traffic shipping channel and tourist location; their spread is exacerbated by increasing water temperatures (Setzler-Hamilton et al. 1995) as a result of climate change.

Potential Conflicts: There are many potential conflicts in the upper reaches of the Chesapeake Bay because this area is highly populated. There is an increasing demand for more boat ramps and waterway access areas, which can increase incidence of invasive species introductions that may alter the prey base for sea ducks. Commercial fishing, crabbing, and oyster economies have seen significant declines due to overharvest since the early nineteenth century (Rothschild et al. 1994, Sharov et al. 2003). Declining bivalve communities due to eutrophication, warming water temperatures, and competition with invasive species can decrease the quality of habitat for wintering sea ducks.

Status: There is a significant amount of protected land in the upper Chesapeake Bay. Most of the land is private and under conservation easement, but there are also federal and state lands such as the Chesapeake Marshlands National Wildlife Refuge Complex, Elk Neck State Park, and Susquehanna State Park, and numerous state wildlife areas (Chesapeake Bay Program 2019). Land and water below the mean high-tide mark is owned and managed by the State of Maryland, with a few exceptions. There are also significant efforts to identify and protect watersheds that are critical to the water quality of the bay. Among the most critical of these is the area surrounding Chesapeake Marshlands National Wildlife Refuge Complex (Chesapeake Bay Program 2019). The Southern Dorchester County Important Bird Area is within this key site. The protection and health of the Chesapeake Bay is closely monitored by the Chesapeake Bay Program (2019).

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