

Aquatic Weed Problems In Estuarine Areas

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Estuaries with their blends of water from the land and the sea, are highly productive areas. They are the incubators and nursery grounds essential for commercial and sport fisheries and they also serve as harvest areas for seafood—including shrimp, crabs, oysters, clams, and mussels as well as finfish. These areas also are of major importance to waterfowl and furbearers. Superimposed upon this productive region of land and water are the multiple overlapping uses resulting from concentrated human populations: water transportation, major industrial complexes, housing and recreational use of the shoreline, and dumping of refuse.

These multiple uses are aggravated by many problems among which undesirable aquatic vegetation is one of the most important. Tampering with the natural plant growth sometimes can cause more serious problems. Alteration of saltmarsh cordgrass (*Spartina* spp.) communities often results in invasion of feathergrass (*Phragmites communis*) which is larger and more vigorous than the cordgrass. Deliberate or accidental introduction of exotics such as: alligatorweed (*Alternanthera philoxeroides*), Eurasian watermilfoil (*Myriophyllum spicatum*), and an Asian marine algae (a *Codium* spp., commonly referred to as green spaghetti grass) further contributes to the weed problem.

Eutrophication or over-enrichment resulting from sewage effluent and other sources of nutrients have stimulated plant growth, particularly algae.

The problem of estuarine weeds can be better understood by considering representative species of the following plant groups: (1) upright emerged, (2) floating-mat and padleaf, (3) submersed, and (4) algae.

Phragmites, or feathergrass, is an example of the upright emerged group. It is a highly adaptable species of world wide distribution and can grow in fresh to saline water. It aggressively invades and dominates disturbed situations such as fill areas resulting from dredging. This large dense grass can present a serious fire hazard. Near airports, the stands of phragmites furnish roosts for blackbirds whose flights are hazardous to jet planes. When this plant completely dominates marshes, it destroys wildlife values. However, like other problem plants, it has its place. The "riprap" growth of its rootstocks prevent erosion of roads, dikes, and fills. When interspersed with open water and other kinds of vegetation, it can provide valuable cover for wildlife.

Alligatorweed, an exotic from South America, and waterchestnut (*Trapa natans*), from Asia, are major problem plants of the floating mat and padleaf group. These species have generally low salinity tolerance. Waterchestnut is injured by salinity as low as 1 percent sea strength. Both species are obnoxious because they can completely dominate the water in which they grow. Alligatorweed is a problem of the South occurring into North Carolina, while waterchestnut is a problem in more northern areas such as Chesapeake Bay and in the Hudson River.

Eurasian watermilfoil, another exotic, is a major weed of the submersed group. It can grow in fresh to brackish water up to 40 percent of sea salinity. It is a severe problem because it can grow a blanket-like growth, sometimes over 7 feet thick, that completely dominates the water. Navigation, commercial and sport fishing, and other recreational uses of water have been harmed. Biotic balance of estuaries has been disrupted. Waterfowl habitats have been damaged

by the crowding out of native duck food plants. The abundance of Eurasian watermilfoil in the Chesapeake Bay fluctuates (the last period of acute abundance lasting some 10 years, 1955-1965). It is a problem along the North Carolina coast.

The fresh and brackish water algae of estuaries are extremely sensitive to nutrient enrichment. This is particularly so in areas of heavy population where their response to sewage effluent caused severe problems. In the Potomac River, sewage effluent is responsible for excessive production of green algae (mainly plankton) diatoms, and blue greens. This has caused a progressive loss of seed bearing submersed aquatic plants over a distance of some 40 miles since 1930. In more saline situations, particularly in the Connecticut River estuaries, spaghetti grass is a major problem. Water lettuce (*Ulva* sp.) produces a thin, tablecloth-like thallus which often breaks away, and is eventually deposited along the shore. Here the anaerobic decay releases hydrogen sulfide. There has been considerable complaint from this type of situation at Barnagat Bay on the New Jersey coast and Chesapeake Bay.

Estuaries, with their multiple uses, provide an opportunity for a coordinated approach to problem plant management. Such operations can result in considerable mutual gains for different interests. For example, control of Phragmites along the Chesapeake and Delaware Canal creates "edge-effect" and an interspersed with other vegetation for wildlife as well as firelane protection of the canal installations. Control of waterchestnut in the tidal Hudson River and upper Chesapeake Bay is essential for small boat travel, other recreational uses of water, and fish and wildlife habitat. The same holds for Eurasian watermilfoil control. It is also beneficial to commercial fisheries, particularly shellfish. Control of eutrophication by better management of sewage effluent falls in the category of preventive weed control. Such procedures curtail phosphate and nitrate enrichment and thereby restrict over-aggressive growth of vegetation, particularly algae.