Executive Summary (Patuxent SAV planting)

This report details the methods, results, and conclusions from the MD-DNR 2004-2005 large scale eelgrass restoration efforts on the Patuxent River. Because of the essential functions that SAV serve in maintaining a healthy Chesapeake Bay ecosystem: producing oxygen, providing food for a variety of animals and waterfowl, providing shelter and nursery habitat for juvenile fish and crabs, and reducing pollution and improving water quality by absorbing nutrients and trapping sediments, the U.S. Environmental Protection Agency's (EPA) Chesapeake Bay Program (CBP) adopted a goal seeking to increase SAV acreage in the Chesapeake Bay to 185,000 acres by 2010, with an additional goal to plant 1,000 acres by 2008. In order to meet the latter goal, large scale SAV restoration efforts were initiated. This project was initiated to conduct large scale restoration of eelgrass in the Patuxent River, MD by dispersing seeds using two methods: spring seed bags and fall seed broadcasts.

- For the spring seed bag method, eelgrass reproductive material harvested from healthy donor beds in the lower bay was deployed within a few days using a buoy-deployed seeding system (BuDSS) allowing seeds to fall out naturally in suitable shallow water habitat.
- For the fall seed broadcasts, reproductive shoots were held throughout the summer to allow seeds to separate from reproductive material as they matured for later broadcast.

At five restoration locations in the Patuxent River, 23.75 acres have been seeded using both methods since the start of this project in 2003. In addition to seed dispersal, adult

eelgrass shoots were planted in test plots to monitor the survival of adult plants at the seeding areas.

Some technical problems were encountered with the seed processing and storage procedures, and the germination and survival rates of the planted seeds were both low. High mortality of seeds held over the summer limited the acres that could be planted using fall seed broadcasts. Although no seedlings germinated (recruited) from the fall seed broadcast method, 874 total seedlings were recruited using the spring seed bag method. Increases in turbidity and temperature during the 2005 eelgrass growing season appear to be responsible for the demise of all of the recruited plants (seedlings) and adult test plot plants in the late summer.

Despite the problems in seed processing and storage, and the loss of all recruited seedlings that occurred, our understanding of the physical and chemical processes that affect eelgrass growth and survival in this river has increased significantly. Since seeds have so little stored energy, planting SAV using seeds may only be successful in years that have near-optimal conditions for germination and establishment of seedlings. Since we are currently unable to predict which years these will be, we may need to plant eelgrass seeds for several years at the same sites to have one successful year. Once we have a few successful years with planting seeds, we will be better able to predict when these years are likely to occur, and increase our SAV planting from seed efforts in those years.