

## WELLS HARBOR SALT MARSH RESTORATION STUDIES

**Client:** Town of Wells and U.S. Army Corps of Engineers

**CHANGES IN STREAM CHANNEL** morphology have been monitored and the extent of salt marsh habitats within the Webhannet River estuary system in Wells have been mapped by Woodlot since 1996. For this work, our scientists have mapped vegetation and community types, identified tide channel and habitat fluctuations, produced maps and cross sections of the project area using state-of-the-art laser rangefinder and GPS technology, and produced GIS maps and data files for the U.S. Army Corps of Engineers (Corps) and other regulatory agencies. The purpose of our monitoring efforts has been to graphically depict physical marsh characteristics at representative monitoring points to document change in bank and channel configuration.

During initial review of the harbor dredge application, questions were raised regarding erosion along the margins of the back barrier salt marshes of the Webhannet River and Drakes Island estuaries. In January 1998, the Town of Wells



entered into a memorandum of agreement with Maine Audubon, U.S. Fish and Wildlife Service, the Corps, the State of Maine, and Save Our Shores that included a 5-year monitoring program for measuring incremental changes in the marsh due to processes of erosion and accretion.

Woodlot identified 42 areas within the Webhannet River marsh that appeared to be actively eroding, accreting, or stable. Each of these areas was visited to verify the condition of the marsh, establish a monitoring location, and take a preliminary GPS position for dredge permit application purposes. Monitoring locations were chosen to sample areas of accretion, areas of bank erosion, and areas that appeared relatively stable (no apparent signs of accretion or erosion).

Although the identification of physical marsh features seems straightforward, each monitoring point presented subtleties that

required biological field interpretation. For the purposes of data replication, we developed parameters to aid in mapping marsh features. Botanical and community data collected at each point included the edge of the high marsh community, the outer limits of vegetation near the tidal channel, and the bottom of pronounced cut banks along the tidal channel.

Monitoring locations were located with a Trimble™ 4800 GPS total station to achieve centimeter accuracy in three dimensions. Each of the GPS positions was then used to geo-reference survey data collected for marsh. Woodlot also used a Laser Technologies, Inc.™ Impulse LR laser range finder with an attached MapStar electronic fluxgate compass to capture feature data in relation to the rebar stake. By linking the laser survey data to the GPS data, we create a geo-referenced three-dimensional map of the features of each survey area.