EXECUTIVE SUMMARY

Penobscot Bay, Maine is one of the most productive lobster (*Homarus americanus*) fishing grounds in the species' range. The Bay is also host to the Rockland Disposal Site, a 0.25 nmi^2 area that periodically accepts dredged sediment from regional harbors. This study was conducted in response to fishing industry and state marine resources agency concerns that late-autumn dredged material disposal at the Rockland Disposal Site could negatively impact lobster migration.

We applied a trap-based mark-recapture methodology to assess the impact on local lobster catch, abundance and movements during a period of disposal beginning in late autumn 2002. We set 72 lobster traps in a geo-referenced, 1.7 by 0.9 km array over the disposal area. The array was divided into three equal areas: a treatment area, impacted by dredged material, flanked by two control areas. Sampling began on November 1, 2002 prior to onset of disposal on November 18, and continued until December 19. We counted lobsters and crabs (*Cancer irroratus*) in each trap haul, tagged all lobsters and released them at the same trap location.

From the onset of disposal to the end of our sampling there were 81 disposal events, totaling 57,105 m^3 of material. Pre- and post-disposal side-scan sonar surveys revealed a new mound of soft sediment covering 7-18% of the treatment area (44,170 - 108,881 m^2). Lobster catch rates declined over the full course of the study, and the decline at the impacted area largely paralleled those in the control areas. Preliminary mark-recapture analysis supports patterns observed in catch rates, reflecting a decline in abundance and not merely a decline in the propensity to enter traps.

No statistically significant impact of disposal on lobster abundance or movement was detected. Declines in the disposal area were more likely the result of the regular fall migration of lobsters out of the Bay than of dredged material disposal. Recapture of tagged lobsters outside the study area by harvesters reflects this seasonal pattern of lobster movements. However, the abundance of emigrating lobsters at the disposal site in mid-November suggests that direct impacts to lobsters may be minimized when disposal occurs after the autumn emigration period. The quantitative data collected by this study provides a basis by which to assess potential impacts for future projects.

In contrast, the overall catch of rock crabs (*Cancer irroratus*) increased dramatically in the treatment area relative to the control areas within a few weeks of the onset of disposal. Moreover, crab catches were highest at traps nearest the newly deposited sediment. Thus, while we did not detect an effect of disposal on lobsters, crabs aggregated around the disposal site possibly because it provided a richer source of food than the surrounding area.