Essential Fish Habitat project status report

Reporting date: Oct. 29, 2009

Project number: 2008-03, 2009-05

Title: Contrasting predation intensity and distribution in 2 rock sole nursery areas: a principle factor controlling nursery productivity - Component A: Contrasting predation.

PIs: Ryer, Laurel, Knoth

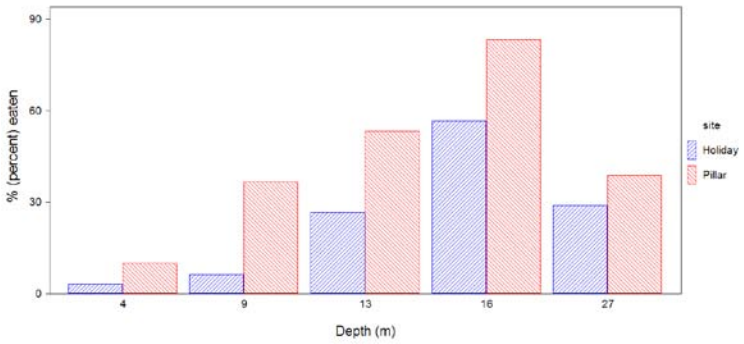
Funding year: 2009

Funding amount: $20,000

Status: ☒ Complete ☐ Incomplete, on schedule ☐ Incomplete, behind schedule

Planned completion date if incomplete:

Reporting: Have the project results been reported? If yes, state where the results were reported and attach an electronic copy of the report. Thus far, one manuscript derived from this project has been submitted for publication to Marine Ecology Progress Series (see attached manuscript). We anticipate submitting either 3 or 4 additional manuscripts, supported in part by this and prior HEPR funding, during the course of the next 24 months.



Results: What is the most important result of the study? As in 2008, worm turf constituted a dominant habitat feature at Pillar Creek Cove, and to a lesser extent at Holiday Beach. However, unlike 2008, when the turf was extremely dense and contiguous, during 2009 the turf was less dense and more patchy. In 2008, fish were aggregated along the edge of the turf. In 2009 fish were most abundant within the sand patches within the turf. Tethering (15 min sets) revealed increasing predation risk with increasing depth at both sites. This was particularly evident as depth increased from 4 to 16m. Sixteen m corresponded to the shoreward edge of the worm turf, which then extended out to approximately 50m depth. Importantly, predation decreased significantly at 27m, at depth at which tethers were set in the worm turf proper. These result support one of our principle theories regarding use worm turf habitat by juvenile flatfish; worm turf provides protection from predators, but is avoided

when it becomes so dense as to preclude unfettered access to the bottom and interferes with movement and burial.

A second important finding was that predation was uniformly lower at Holiday Beach than at Pillar Creek Cove. These results are consistent with our prediction stated in our original proposal to HEPR for 2008 funding. We had previously documented comparable predation rates at these 2 sites (see attached manuscript). These results suggest that the nursery value of these sites may vary from year to year. The significance of this data may become more clear as video survey data of predator abundance from 2002 – 2009 in completed this winter.

Lastly, as expected, predation upon juvenile flatfish was much lower at night than during the day.

Essential Fish Habitat project status report

Reporting date: Oct. 29, 2009

Project number: 2009-11

Title: Contrasting predation intensity and distribution in 2 rock sole nursery areas: a principle factor controlling nursery productivity - Component B: Monitor worm turf recovery and seasonal changes.

PIs: Ryer, Laurel, Knoth

Funding year: 2009

Funding amount: $13,000

Status: ☐ Complete ☒ Incomplete, on schedule ☐ Incomplete, behind schedule

Planned completion date if incomplete:

Reporting: Have the project results been reported? If yes, state where the results were reported and attach an electronic copy of the report. We anticipate submitting a manuscript for peer-reviewed publication during the next 12 months.

Results: What is the most important result of the study? We are still analyzing video footage. However, disturbance of the worm turf habitat attributable to our simulated bottom trawling activity appears to have been relatively minor compared to the seasonal pattern of benthic disturbance driven by winter storm activity. Initially, scrape marks where worms were removed by our gear were readily evident along our disturbance tracts. Also, consistent with our results from component A, juvenile flatfish abundance increased in these disturbed tracts. However, within several months wave action began to erode away sections of the worm turf, so that by late winter/spring, the formerly contiguous turf had be reduced to a patchwork of turf habitat, and trawl disturbed tracts were no longer recognizably different from control areas. We suspect that excavations attributable to sea stars and/or sea otters constituted initial disturbances, which were subsequently expanded by bottom surge (much in the same way wave action expands small holes in mussel mats caused by log impacts in the inter-tidal). We will finish data analysis in the next 6 months and anticipate submitting a manuscript this year.