Essential Fish Habitat project status report

Reporting date: 10/26/11

Project number: 2009-3, 2010-1, 2011-2

Title: Recruitment and response to damage of an Alaskan gorgonian coral

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Funding year: 2011

Funding amount: FY2009 $38,000, FY2010 $32,900, FY2011 $16,700

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

Planned completion date if incomplete: This is a multi-year study that required several site visits and observations. Scheduled field operations finished August 2011. Laboratory analyses of settlement substrata were completed September 2011. Video processing from scuba observations will be completed during the winter of 2011. A draft manuscript shall be completed in 2012. Additional site visits are not planned for 2012. However, a site visit in 2013 or 2014 may be advisable to examine longer-term recruitment processes and responses to damage.

Reporting: No reporting has occurred yet.

Results: In August 2009, a team of four divers located and tagged 48 *Calcigorgia spiculifera* colonies in Kelp Bay, Southeast Alaska. Of that total, 9 colonies were fitted with settlement rings equipped with natural rock tiles. The settlement rings were epoxied to the seafloor and on subsequent site visits, a subsample of the tiles were collected and inspected for adhesion of coral planulae, i.e., recruitment. Where tiles were removed, new tiles were installed. The remaining 39 tagged colonies were ascribed to three damage treatment groups and a control group to assess the sensitivity and recovery of disturbed coral. The damage treatments were designed to mimic actual damage that can occur from passing fishing gear. These treatments were performed *in situ* and included deflection, gorgonin excision, and branch severance. Video of each colony was recorded before and after the treatments were performed to establish baseline coral characteristics and to identify immediate treatment effects. The deflection treatment was completed by passing a simulated trawl footrope over each colony. This resulted in immediate dislodgement of one coral colony.

In June and September of 2010 and August of 2011, tagged colonies of *Calcigorgia spiculifera* were revisited in Kelp Bay. Video of each colony was recorded to identify treatment effects at 10, 13 and 24 months post-disturbance. Although thorough analyses of video observations are not scheduled to be complete until late in 2011, preliminary observations of damaged corals revealed a surprising level of resiliency. For example,

the colony broken from its holdfast during the deflection treatment still had living tissue despite the fact that it had been laying on the seafloor for two years. Furthermore, some colonies that had gorgonin (soft tissue) excised during the treatment process showed signs of tissue regeneration. Overall though, the treatments have had negative effects on most colonies. Many have necrotic tissues or have shed branches and a few colonies have disappeared completely.

Additionally, on each site visit since settlement rings were installed, we collected 16 tiles (48 total) and inspected them for adhesion of coral planulae, i.e., recruitment. Although we did not find coral recruits on the tiles, we have seen colonization by many other organisms including anemones, bryozoans, tunicates, and hydroids. Recruitment of *C. spiculifera* is likely sporadic and rare rather than periodic and seasonal so it is not surprising that we did not observe recruitment over the two years of monitoring. However, the fact that we observed recruitment onto our tiles by other organisms is encouraging that the substrates we have selected will be suitable for coral adhesion if and when the corals eventually release planulae.

The remaining damaged colonies of *C. spiculifera* may persistent for some time and the ultimate fate of these colonies may not be known for several years. Therefore, subsequent monitoring of the damaged corals could provide further details on the long-term effects of disturbance on coral survival and growth. Also, 128 settlement tiles remain on the seafloor. These tiles were placed on various dates and additional collections will increase the odds of finding new colonies and establishing a rate of recruitment for this little known species. Additional site visits are not planned for 2012. However, a site visit in 2013 or 2014 may be advisable to examine longer-term recruitment processes and responses to damage.