Essential Fish Habitat project status report

Reporting date: 10/21/2009

Project number: 2009-08

Title: Productivity, habitat utilization and recruitment dynamics of Pacific cod

PIs: Laurel, Ryer, Stoner, Knoth, Parrish, Urban

Funding year: 2009

Funding amount: $41,600

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

Planned completion date if incomplete:

Reporting: Project has been fully reported. Results and details are found in the following manuscript submitted for peer-review:

Copeman LA, Laurel BJ, Parrish C (submitted) Effect of temperature on rates of terrestrial short chain PUFA uptake in two juvenile gadids: Pacific cod (*Gadus macrocephalus*) and walleye pollock (*Theragra chalcogramma*). Canadian Journal of Fisheries and Aquatic Sciences.

Results: What is the most important result of the study?

1) Age-3 cod were observed on the baited camera for the first time, suggesting high survival from the abundant 2006 year class.

2) Fatty acid (FA) biomarker experiments were successfully completed using both juvenile Pacific cod and walleye pollock (see above submitted manuscript). Experiments were conducted at two temperatures using both a marine and terrestrial signal. Dietary biomarkers showed high temporal sensitivity across temperatures, and were evident in all fish tissues after only one wk of feeding. Cod held at 9ºC had a significantly higher rate of terrestrial biomarker uptake in the liver, but this effect diminished from wk 1 to wk 8 as fish tissue reached FA saturation. The proportion of terrestrial biomarker uptake was also significantly higher in liver than in heart tissue or flesh.

   Together, the differential uptake of terrestrial polyunsaturated fatty acids (PUFAs) among tissues (e.g., FA in liver:FA in heart) provide two important pieces of information: 1) they provide a signature for linking juvenile fish to nursery regions and 2) they provide a means of determining the timing of offshore-inshore nursery migrations (both to and from).

3) Stomachs from age 1+ Pacific and saffron cod were also collected and frozen for the ongoing examination of cannibalism in these species. Three years of stomach data are now collected and archived at the KFRC and will be used in future syntheses led by co-PI Knoth.