

Performance Progress Report - NA10NMF4270214

Title: **Enhancing Sea Scallop Stocks in Eastern Maine through Applied Aquaculture Research and Technology Transfer**

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Project Period: **June 1, 2010, through June 30, 2013**

Report Period: **December 1, 2011 through May 31, 2012 (Fourth Progress Report)**

Original Project Objectives:

1) To determine the most cost effective methods of producing sea scallop spat for stock enhancement (collection of wild spat using collectors similar to those used successfully in Japan and Canada versus hatchery culture of scallop larvae and juveniles);

2) To determine effects of stocking density of wild/cultured sea scallop spat on growth and survival in three intermediate nursery culture scenarios (floating surface trays vs. suspended pearl nets vs. submerged bottom trays);

3) To determine how spat size affects growth and survival in bottom plots over a 10-month period; and,

4) To determine how the interactive effects of predator deterrence and habitat modification influence scallop spat growth and survival in bottom plots over a 10-month period.

We have abandoned the collection of wild spat as a valid mechanism to produce sea scallop spat for stock enhancement because of the high variability of in numbers of wild spat using the techniques bags and other devices that have been used in similar applications in Canada and the U.S. We now have four years of data on wild spat collection, and the number of spat per bag in the field areas we have set bags averaged less than 10 individuals – much lower than what would be considered a commercial application for successful stock enhancement.

We are unable to focus on the third and fourth objectives until we have arrived at a consistent and successful technique to grow sea scallops under hatchery conditions. No opportunities for successful stock enhancement using spat will be available to the state of Maine or other entities until hatchery techniques can be developed to produce massive quantities of sea scallop spat.

We have continued to spawn conditioned sea scallop broodstock during this report period; however, we are unable to report consistent results at this time. We have produced 100's of juveniles, but our goal is millions. Given that we were not able to focus on objective 3, it

became clear in early February that we should focus our complete attention on hatchery production.

Recently, we requested a no-cost extension for the project through 6/30/2013. In addition, we requested a re-budgeting of our existing funds that would enable us to use the remaining resources for hatchery production trials.

We submitted the following information to NMFS in hopes that they would agree with our new approach:

To date, we have drawn down \$51,705.95 of the original grant of \$165,175.13, or approximately 30%. We have kept expenses to a minimum, with most of the funds spent on equipment for the wild spat collection trials, constructing and equipping a “boreal culture room” at the Downeast Institute where we can control air and seawater temperatures (a crucial aspect for sea scallop culture), and salaries/fringe. This leaves \$113,469.18 remaining from the original grant.

We propose to focus full attention during the next 12 months (to June 2013) on developing culture techniques in both the hatchery environment and our field nursery site to create repeatable, effective methodologies for mass culture of sea scallop spat and juveniles. This re-focus of objectives is necessary prior to any on-bottom growth/survival field experiments because without commercial quantities of sea scallop spat, any reasonable stock enhancement effort cannot proceed.

We presented the following detailed budget to accompany the re-focusing of objectives.

Detailed Budget Narrative

a. Personnel - Salary

1) DEI production manager (6 months @ \$3,205.83/mo.)	\$19,235.00
2) Hatchery technician (12 months @ \$2,375.00/mo.)	\$28,500.00
3) Beal (1 month)	\$ 7,009.00
4) Four work-study students (each @ \$10/hr * 448 hrs)	<u>\$17,920.00</u>
Subtotal (Salaries)	\$72,664.00

b. Personnel – Fringe¹

1) DEI production manager	\$ 8,136.00
2) Hatchery technician	\$12,055.00
3) Beal	<u>\$ 2,965.00</u>
Subtotal (Fringe)	\$23,156.00

c. Supplies ²	\$ 8,000.00
d. Other Costs ³	<u>\$ 9,649.18</u>
Total	\$17,649.18

¹ Fringe includes FICA, Worker’s Compensation, Unemployment Compensation, Health Insurance. Rate = 42.3% for all personnel.

²Supplies include materials for culturing scallop larvae – sieves, tanks, lights, nutrients, hoses, algal cultures, glassware, tubing, etc.

³Other costs include utilities, telephone, bookkeeping and payroll services, etc.

We propose to collect broodstock regularly throughout the upcoming year and to condition animals to spawn every two months. Batches of larvae will be monitored and fed daily and tanks cleaned every other day. We will track growth, survival, and development from fertilization through metamorphosis. We will incorporate several experimental variables into our larval culture (phytoplankton species and feeding density). In addition, we will examine the effectiveness of several different settlement devices such as window screening, spat bags, plastic mesh netting, and frizzy ropes. Once animals have settled onto screening, bags, netting and/or ropes, the juveniles will be cultured at DEI until they reach ca. 3 mm in shell height. At that time, we will transfer them to our field nursery site so that we can examine our original second objective (see above).

In re-focusing our efforts to produce commercial quantities of sea scallop spat, we plan to develop repeatable culture methodologies so that stock enhancement efforts may proceed and that our original objectives (3 & 4 – see above) can be assessed.

The request for the no-cost extension has been granted. We now await approval of our re-programming and re-budgeting.