

Research on the Stock Enhancement of Alaska King Crab

Alaska Sea Grant Project OF/07-02

Quarterly Progress Report: 9-20-07 to 12-20-07, as required by the NOAA Fisheries, Aquaculture Program

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Introduction:

Stock enhancement has the potential to be an effective tool for rehabilitation of depleted stocks and for fishery management and is currently in progress for crab and lobster species in the US and worldwide. However, before implementation, research is needed to assess the feasibility, effectiveness, and possible consequences of a stock enhancement program. The Alaska King Crab Research and Rehabilitation and Biology (AKCRRAB) Program was created in 2006 as a partnership between the University of Alaska Fairbanks, Alaska Sea Grant, the Alutiiq Pride Shellfish Hatchery (APSH), NOAA Fisheries, and several community-based groups, to begin the necessary research to assess the feasibility of stock enhancement for king crabs in Alaska. Commercial harvest of Alaskan king crab was for decades active and lucrative. However, many stocks declined drastically over 20 years ago and have not rebounded, even in the absence of fishing. Work is being done to study the early life history of red and blue king crab species to develop methods and determine feasibility of hatchery rearing. This project addresses methods for culture of larvae and juveniles in the Alutiiq Pride Shellfish Hatchery in Seward, Alaska.

Outline:

The AKCRRAB project currently has 2 primary phases. The first phase focuses on hatchery scale cultivation of red and blue king crab larvae and evaluates effects of stocking density, diet, and other water parameters on growth and survival. The second phase focuses on hatchery scale cultivation of juvenile red and blue king crab and evaluates effects of stocking density, diet, substrate type and other culturing parameters. Juvenile experiments also aim to investigate tagging techniques in order to track hatchery crabs in the wild and perform simulated releases in large tanks.

The long term vision on the AKCRRAB project hopes to conduct field studies to address questions regarding habitat preference, predator/prey interaction and tagging. There are hopes to do genetic work will determine a genetic base line of wild stocks and assess any potential genetic risks of releasing hatchery crabs. There are also long term plans to look at disease history of wild stocks and the pathology of individuals to be out planted.

Work Completed during 9-20-07 to 12-20-07

September

Fine tuned logistics for the second year of larval rearing experiments.

Improved tank design.

Logistics for an improved hatchery set up were laid out.

Flow rates and temperature controls addressed.

The specifics in filtration and water delivery were designed.

Parts were ordered to assemble the filtration system, new experimental tanks, and various lab supplies.

Preparations were made for field work in Kodiak.

October

Arrived in Kodiak on Oct 1st and worked at the Kodiak NMFS lab with various biologists on field related studies.

Built a working relationship and facilitated collaboration with NMFS biologists in Kodiak on future field studies looking at habitat use of early juvenile red king crabs.

Conducted preliminary, exploratory king crab surveys via scuba.

Sampling methods/tools were explored including a scuba suction dredge as a way of studying 0-1 year old red king crab.

Prepared broodstock collection, transportation, and holding permits with ADF&G.

Presentated to the Kodiak public on the AKCRRAB program.

Conducted extensive literature reviews and searches on king crab ecology.

November

Prepared the Alutiiq Pride Shellfish Hatchery for upcoming larval rearing experiments.

Installed an entirely new water treatment and delivery system including sand filters, bag filter, UV sterilizers and carbon filters.

Installed additional experimental tanks with new water delivery.

Plumbed hatchery production tanks with the capability to control water temperature.

Cold water alage (*Thalassiosira nordenskioldii*) cultures begun.

Broodstock transportation to Seward from Anchorage.

Broodstock care.

December

Prepared the Alutiiq Pride Shellfish Hatchery for upcoming larval rearing experiments.

Broodstock care and developing husbandry techniques.

Cold water algae culture.

Plumbing of hatchery tanks.

Fine tuning of water delivery system.

Presentation at crab conference in AK.

Work Forecast

In 2008, we plan to investigate effects of stocking density on small and large scales with modifications to water flow, water filtration, and tank aeration to improve larval survival. Broodstock are expected to release larvae in spring 2008. With a successful larval run, we plan to conduct juvenile rearing production trials to investigate effects of diet and stocking density on survival. As juvenile crabs grow, we also plan to investigate growth rates and try various physical and genetic tagging methods. The following is work planned to be done broken down by report period for 2008.

1-1-08 to 3-31-08

Duties will include:

Broodstock care.

Broodstock isolation

Artemia culture

Algae culture

Flow experiments

Large scale king crab larval rearing experiments

Small scale king crab larval rearing experiments

Hatchery maintenance

Broodstock permitting

Data recording

Data analysis

Blue king crab broodstock acquisition

4-1-08 to 6-31-08

Duties will include:

Broodstock Care.

Broodstock pathology sampling

Artemia culture

Algae culture

Large scale king crab larval rearing experiments

Small scale king crab larval rearing experiments

Hatchery maintenance

Broodstock permitting

Data recording

Data analysis

7-1-08 to 9-31-08

Duties will include:

Broodstock Care.

Broodstock pathology sampling

Artemia culture (if needed)

Algae culture (if needed)

Large scale king crab larval rearing experiments (depending on timing of larval release)

Small scale king crab larval rearing experiments (depending on timing of larval release)

Hatchery maintenance

Broodstock permitting

Data recording

Data analysis

Juvenile production experiments (depending on timing of larval release)

Potential field work in Kodiak

10-1-08 to 12-31-08

Duties will include:

Broodstock Care (if needed)

Broodstock pathology sampling (if needed)

Hatchery maintenance, improvement

Broodstock permitting

Data recording

Data analysis

Juvenile production experiments (depending on timing of larval release)

Report writing

Broodstock permitting

Potential field work in Kodiak

