

Alaska King Crab Research, Rehabilitation and Biology (AKCRRAB)
Program
Progress Report
May 2007

Introduction

Launched in 2006, The Alaska King Crab Research, Rehabilitation and Biology (AKCRRAB) Program is an Alaska Sea Grant partnership of regional fishermen's groups, coastal communities, NOAA Fisheries, the Alutiiq Pride Shellfish Hatchery and Chugach Regional Resources Commission, and the University of Alaska Fairbanks School of Fisheries and Ocean Sciences, to conduct a research program aimed at hatching and rearing wild red and blue king crabs in a large-scale hatchery setting. This coalition of state, federal, and stakeholder groups views the effort as important to the region's long-term economic development and sustainability.

Mission

To understand the large-scale culturing needs of wild red and blue king crab stocks, and to perfect strategies for hatching and rearing king crab to a stage where they can be released into the wild and contribute to reversing low wild stock abundance in Alaska.

Goal

To rehabilitate depressed king crab populations around Kodiak Island and the Pribilof Islands, Alaska.

Funding:

Permanent funding for the AKCRRAB Program in Alaska is currently being sought. An initial annual funding proposal of \$2.5 million over three years starting in FY08 has been developed, primarily to support the cost of scientific research aimed at culturing/rearing king crab larvae at the Alutiiq Pride Shellfish Hatchery.

The non-federal program organizers have presented this request for funding to the Alaska Congressional delegation, where it has active support. The funding request also includes support for University of Alaska faculty and graduate student research through contracts with Alaska Sea Grant. A funding request for \$120,000 from the Alaska

Legislature was recently approved.

During 2006-2007, the AKCRRAB Program partners committed approximately \$326,000 to the program's wild stock collection and research efforts.

Following the March 2007 AKCRRAB Steering Committee meeting, the NOAA Aquaculture Program agreed to support a 1.5 FTE position through Alaska Sea Grant. This \$175,000 support will allow the hiring of a research biologist (a 1.5 year position starting in June 2007) to be responsible for blue king crab husbandry, but will also be available to assist in red king crab husbandry and data collection associated with phase 1 and 2 of the science plan. The NOAA funding is in addition to the ongoing support provided by Alaska Sea Grant to the program, and NOAA Fisheries for involvement of Sara Persselin and Al Stoner of the NOAA Northwest Fisheries Science Center's Newport (Oregon) Research Station.

Funding Summary FY07

1. NOAA

a. Alaska Sea Grant (ASG): Funding during FY06 was \$75,000; while expenditures in FY07 are anticipated at the \$200,000 level. Funding has supported one summer intern, one graduate student, and one research technician. In addition, ASG supported one month's salary for two faculty advisors, purchase of equipment, computers, instruments, supplies, travel, and news media and outreach materials.

b. Alaska Fisheries Science Center: Approximately 10% of Al Stoner's time will be made available to provide additional oversight for phase III of the science plan in FY07. In addition, 40% of Sara Persselin's time has been made available to the AKCRRAB Program, as has support for her travel to and from Kodiak and \$4,000 in supplies.

c. NOAA Aquaculture: \$175,000 has been allocated to the program for a research biologist position. Approximately \$153,000 of this sum will support crab husbandry and research, with the remainder available for outreach and travel. NOAA's estimated total allocation in FY07 is approximately \$240,123.

2. Alutiiq Pride Shellfish Hatchery: \$75,000 was provided in FY06. The hatchery has provided in-kind support for tanks, water supply aerators, and other equipment needs. The Alaska Legislative approved

\$120,000 for the program in May 2007.

3. Industry partners: The United Fishermen's Marketing Association (UFMA) and the Gulf of Alaska Coastal Communities Coalition have provided funding to the workshop, in addition to funding the time of Jeff Stephan UFMA. The Alaska Crab Coalition has provided money to the workshop as well.

4. Coastal Community Support: Community Development Quota organizations including the Aleutian Pribilof Island Community Development Association and the Central Bering Sea Fishermen's Association each have provided \$45,000, for a total of \$90,000, to help fund brood stock acquisition, hatchery equipment, and care for the red and blue king crabs. The City and Borough of Kodiak together provided \$20,000 to support the March 2006 workshop in Kodiak. The Gulf of Alaska Coastal Communities Coalition also provided funding for the workshop.

Science Planning

The AKCRRAB Steering Committee, at its March 2007 meeting, formed a Scientific Advisory Committee to develop a science plan and guide research efforts of the program. The immediate focus of the science plan would be to guide studies related to large-scale culturing needs and larval development. The need for additional studies related to release trials is recognized.

The Scientific Advisory Committee and Steering Committee also are engaged in discussions to establish an Independent Scientific Advisory Panel to provide additional scientific oversight and review.

The AKCRRAB Scientific Advisory Committee presently consists of Co-Chairs Ginny Eckert, associate professor with a joint appointment at the University of Alaska Fairbanks and UA-Southeast, and Brad Stevens, professor at the University of Massachusetts Dartmouth; and members Celeste Leroux, ASG graduate student; Sara Persselin, NOAA Fisheries research biologist; Brian Allee Alaska Sea Grant director; Ben Daly, ASG research biologist; and Al Stoner, NOAA Fisheries research biologist.

The science plan currently is in outline form, and is scheduled to be finalized in June 2007. Following is an outline of the three phases of the initial science plan for the AKCRRAB Program.

Phase I consists of the hatchery-based experiments with larval red and blue king crab. Experiments will be designed to help evaluate the effect of diet, culturing effects, density, and other parameters on larval growth and survival. In addition, studies on settling behavior will be

considered.

Phase II will involve hatchery-based experiments with juvenile crab. These experiments will include determining the best density of juveniles and type of substrate to use in the hatchery, tag development, and longer term growth and survival studies in simulated out-planting experiments in large tanks. Also, the development of enclosures, to be used in the wild and preliminary diving observations of habitat selection and behavior of blue and red king crab juveniles in a selected field site, will be carried out.

Phase III will involve laboratory and field projects, including examination of ecological questions that focus on larval recruitment variables around Kodiak. An experimental design to evaluate survival rates of wild and hatchery-reared crab will be developed. In addition, experiments to evaluate the importance of small-scale habitat differences between different rearing environments around Kodiak should be considered. Some work may be conducted in the Pribilofs, but due to the difficulty in controlling studies there this will have to be evaluated and determined.

To date, science plans have been fully developed for the brood stock acquisition and culture of red and blue king crab larvae, and post-larvae development at the Alutiiq Pride Shellfish Hatchery, including Celeste Leroux's graduate studies.

The Scientific Advisory Committee recognizes that research within a project such as this—which involves assumptions about crab early life history and where adequate data are not available to evaluate the sensitivity of the operations to these assumptions—has to be approached with a long term perspective (i.e., longer than a three-year time horizon). One of the goals of the project will be to lessen uncertainty regarding early life history and the trophic interactions important in these life stages.

2006 Milestones

March

Alaska Crab Stock Enhancement and Rehabilitation Workshop, held in Kodiak.

News release: <http://seagrant.uaf.edu/news/06news/02-28-06crab-meeting.html>

Proceedings:
<http://seagrant.uaf.edu/conferences/crab06/index.html>)

June

Alaska Department of Fish and Game (ADFG), Commercial Fisheries Division, issued permit to Jeff Stephan, United Fishermen's Marketing Association, and Alutiiq Pride Shellfish Hatchery, to collect 30 adult red king crab (including 15 ovigerous females) from Alitak Bay, for brood stock and pathology/genetic sampling.

August

Alaska King Crab Research and Rehabilitation Program officially launched. (Note named change in 2007.)

Under the UFMA/Alutiiq Pride Shellfish Hatchery collection permit, ADFG biologists collected 32 adult Kodiak red king crab (including 16 ovigerous females) for brood stock and pathology/genetic sampling. Adult crabs were sent to UAF Seward Marine Center, and housed in tanks once used by noted crab researcher A.J. Paul. Crabs are tended by UAF technician Phyllis Shoemaker.

News release: <http://seagrant.uaf.edu/news/06news/08-15-06crab-rehab.html>

Two rooms at the Alutiiq Pride Shellfish Hatchery in Seward were remodeled to serve as a crab cultivation center, with tanks and associated plumbing installed to cultivate crab larvae.

October

Intense fall weather system delivered record rain and winds to Southcentral Alaska, causing major floor damage to parts of Seward. The Alutiiq Pride Shellfish Hatchery sustained major damage. Crews cleaned and repaired the hatchery, and upgraded equipment and facilities to accommodate adult crab and larvae.

The first major organizational meeting was held in Anchorage on October 31. The Steering Committee was established, and program planning began.

ADFG Commercial Fisheries Division issued a permit to Heather McCarty of the Central Bering Sea Fishermen's Association to collect 30 adult blue king crab, including 15 ovigerous females, from Pribilof Islands waters.

November

A fisherman under contract from the Central Bering Sea Fishermen's Association collected 28 blue king crab, 15 egg-bearing females and 13 additional males and non-egg bearing females. News release: <http://seagrant.uaf.edu/news/06news/12-04-06blue-crab.html>

Hatchery technician Jim Swingle joined the research team at the Alutiiq Pride Shellfish Hatchery, and began growing artemia (brine shrimp) used as food for crab and assisting with crab care and research studies.

December

Sara Persselin provided an overview of the project and progress to date to state and federal crab scientists and managers at the Alaska Interagency Crab Meeting held in Anchorage.

2007 Milestones

January

Celeste Leroux, ASG graduate student, arrived in Seward to help finish set-up of the hatchery facilities and prepare for the hatching of the larval red king crab. Red king crab began releasing larvae in February and the brood stock were moved from the UAF Seward Marine Center to hatching tanks at the hatchery.

February

Red king crab released about two million larvae during February and March.

NOAA Fisheries research biologist Sara Persselin spent two weeks in Seward assisting the final preparations for starting the larval red king crab experiments.

Tours of research program provided to students and teachers participating in the 2007 Alaska Region, National Ocean Science Bowl.

March

Celeste Leroux began diet trials with the red king crab larvae. Jim Swingle stocked and maintained nearly 1.5 million larvae for hatchery rearing trials.

An informational tour of the AKCRRAB Program was held in Seward on March 24. Fishing industry representatives, coastal

community leaders, citizens, as well as state and federal scientists and resource manager, among others, attended the event, during which they learned about the program and participated in a tour of the Seward Marine Center and Alutiiq Pride Shellfish Hatchery. A contingent of state lawmakers and state resource agency officials who had attempted to fly into Seward, were unable to leave Anchorage due to inclement weather.

Red king crab completed hatching larvae by the end of March and all but five of the adults were provided for pathology and genetic sampling. The remaining five adult crabs were used to train new research technician Ben Daly on sampling methodology.

April

Ben Daly began work on the project in April and will focus on the blue king crab projects. Daly, who received his master's degree in 2007 for work on crab biology, replaces Jim Swingle, who left the program to fulfill family obligations in Juneau.

Blue king crab, which normally release larvae up to two months later than red king crab, began hatching in mid-April. Research staff maintained the blue king crab in chilled seawater to delay the release of egg clutches until space needs and staffing arrangements were finalized.

Alutiiq Pride Shellfish Hatchery and AKCRRAB Program tours were given to Arne Fuglvog of Senator Lisa Murkowski's Washington, D.C. office; and to Dave and Barbara Woodruff from Alaska Fresh Seafoods in Kodiak; and to Mateo Paz-Soldan, an attorney with Saul Ewing in Washington, D.C., working with the Central Bering Sea Fishermen's Association and the City of St. Paul. Simeon Swetzof, Mayor of St. Paul, also toured the Seward facilities.

May

Elementary school students from St. Paul were given a tour of Alutiiq Pride Shellfish Hatchery, the UAF/SFOSSeward Marine Center, and AKCRRAB Program.

Alutiiq Pride Shellfish Hatchery manager Jeff Hetrick presented an overview of the AKCRRAB Program to the leadership of the Aleutian Pribilof Island Community Development Association.

Alaska Sea Grant produced a comprehensive multimedia web site to serve as a central information point for the AKCRRAB Program. The site offers extensive information on the program such as the science plans, progress reports, news releases, video, audio and photos, and other tools to communicate the program to the public. A secure, password protected, space within the site will be created for use by the program scientists and staff.

Tours of the research program were given to Denis Wiesenburg, Dean of the UAF School of Fisheries and Ocean Sciences, and Christina Neumann, SFOS academic manager.

Ben Daly began blue king crab density and diet studies.

Sara Persselin began assessment of seawater intake water quality, and the potential effects of ocean acidification on blue and red king crab.

June

Brian Allee and Ginny Eckert met with ADFG leadership to discuss crab research.

Congressional staff and NOAA Fisheries leadership toured the Alutiiq Pride Shellfish Hatchery.