**Northern Bering Sea Extension**

**Title:** Bitter Crab Syndrome in the North Pacific *Chionoecetes* spp.

**General Description and Justification:** Please provide a succinct (500 words maximum) description and justification for your proposed project or collection. Please be sure to detail the goals of the project, how the data or specimens will be used, and why it is important for this project to take place at this time (opposed to during future surveys, other available research platforms, etc.).

Bitter crab syndrome (BCS) is a potentially fatal disease of commercially important *Chionoecetes* spp. in the eastern Bering Sea (EBS). It is caused by a parasitic dinoflagellate, *Hematodinium* sp., and is considered an emerging disease worldwide in decapod hosts. Efforts to monitor disease incidences and distribution in EBS *Chionoecetes* spp. over a 25 year period have generated data to track possible trends in the North Pacific and may provide insight as to how climate conditions influence disease patterns. Such trends are important from an industry perspective considering affected Tanner and snow crabs possess a bitter flavor, rendering the meat unmarketable. Recently (2014 & onward), sampling effort has been redirected to index sites, which provide increased ability to determine infection levels and investigate disease-related trends. Since 2014, *Hematodinium* incidence has shown a strong spatial component and infection levels have continued to increase annually in both Tanner and snow crabs. The primary goal of this project is to survey *Chionoecetes bairdi* and *C. opilio* for *Hematodinium* infection at the designated index sites within the Bering Sea, continuing to analyze the data for possible effects on Tanner and snow crabs. The data gathered at the index sites will be used to inform process studies on the effects of this disease on crab hosts and to build a model of infection occurrence in *Chionoecetes* spp. in the Bering Sea.

**Name of Requestor / Point of Contact:** Pam Jensen

**Email:** Pam.Jensen@NOAA.gov

**Daytime Telephone:** 206-526-4122

**Affiliation of Requestor:** AFSC – Kodiak

**Data Types:** Biological specimen

**Detailed collection procedure:** Provide a detailed description of collection procedures including the use of any special equipment and forms. Be as specific as possible and include the desired sampling location(s). If your protocol is graphical and/or cannot be described in text, e-mail the file, including your project title, to RACE.Surveycollections@noaa.gov. For accepted projects, the applicant will be asked to provide an updated full draft of the protocols for inclusion in the At-Sea Operations Manual and a ‘cheat sheet’ for deck operations along with an example of any special data forms.If e-mailing a file, please reference the title of your project in the filename and list below in the provided box.

At the pre-assigned stations within the index sites for *Chionoecetes bairdi* or *C. opilio*, Kodiak staff will randomly select 20 immature crabs. Crab morphometrics will be documented on a provided datasheet and each crab will be assigned a Pathobiology specimen number. For each crab, species, size, sex, shell condition, haul number and visual BCS status will be recorded. Using a clean syringe, 0.2mL of hemolymph will be extracted from each crab & transferred into a well in a 96-well collection plate of 100% ethanol. The plate will be inverted to mix, & sharps and biological waste disposed. At one index site per species, hemolymph samples will be similarly documented and withdrawn from 100 mature crabs.

**Geographic Region of Collection** Can your collection be distributed throughout the entire survey area? If not and the sampling area is more restricted than the general survey terms of Gulf of Alaska or Eastern Bering Sea Shelf then please provide bounding coordinates and name of region (if known) in the fields provided below.

Place keywords: Example: Bristol Bay, Kodiak, Shumagin,Yakutat

Sampling will occur at six specific index sites (three for *C. bairdi* and three for *C. opilio*) throughout the Bering Sea and within established EBS Shelf survey stations. Sites will include: Bristol Bay, Pribilof Islands, St. Matthew Island and northeast stations.

**Fish Crab or Invertebrate?**

Crab

**Species to be collected:** List species by scientific names

*Chionoecetes bairdi*

*Chionoecetes opilio*

**Estimated Time:** In general, how much time does it take to set up, collect, record, and preserve each sample ?

Approximately 5 minutes per sample

**Sampling Design**\*Please select a sampling method that best describes your project. DO NOT SUBSAMPLE = collect every one that comes up in the net; SUBSAMPLE RANDOMLY = the specimens do not need to meet ANY set criteria and therefore will be collected at random across the collection area; SUBSAMPLE SELECTIVELY = Collect only those specimens that meet the criteria set by you in the next question. SUBSAMPLE RANDOM STRATIFIED = specimens will be collected randomly from each of the strata you designate in the next question.

Subsample random stratified

**Selective and Randomly Stratified Subsamples ONLY:** Specify The Criteria. For Choosing Specimens Examples: selective criteria could be specific size ranges, photogenic, specific depths, etc; random stratified could be specimens collected by sex/size/area;

Six index sites are designated, three for *C. bairdi* and three for *C. opilio*. At the appropriate index site, either immature *C. bairdi* or *C. opilio* will be randomly selected for sampling, without regard to sex or shell condition. Maturity will be determined by size (carapace width).

**Target Quantity:** How many specimens do you want collected?

20 crab samples per station at each index site. Each index site will contain 10 stations, and sampling will be conducted by Kodiak staff on each boat. A total of approximately 1400 samples will be collected.

**If the requested amount or frequency of specimens is not achieved, will the request still be useful?**

Yes

**Specimen Type**\* The typical specimen types to be collected on the surveys are listed below. Please select the type that best describes your collection. If none meet your collection's description, select 'Other' and provide your own

Pathological Tissue

(CLang Note: other possible choices: muscle tissue, whole animal collection)

**Do you require individual specimen-level data to be collected?** yes = each specimen sample will be given a unique specimen number.

No

**Do you need to be able to link your project to haul data?\***If you need haul data (e.g. latitude and longitude, depth, temperature, etc) for each of your specimens, it is mandatory that the CruiseNumber, VesselNumber, and Haul numbers be recorded every time we collect your samples; any forms provided by you must contain those fields. Copies of haul data will be e-mailed to the the requestor when survey data are finalized after the end of the field season (usually by October of the same calendar year)

Yes – please link my collection with haul data

**Supplies provided by the AFSC**\*Small quantities of some supplies, such as sample bags, freezer boxes, and standard chemical like ethanol and formaldehyde may be available, but applicants must arrange this specifically with survey contact(s) prior to the start of the survey. If asking for large specimens, then you must supply containers. Select supplies and equipment needed for your project or collection that AFSC will supply

None

(CLang Note: other choices: specimen labels, ethanol, formalin, none)

**Supplies provided by the requestor**\*List all remaining supplies and equipment needed for your project or collection that you will be providing

calipers

syringes

prefilled ethanol plates

needle disposal container

datasheets

Chemical Hygiene\*Select or type in all chemicals and hazardous materials in your project. Please e-mail MSDS's for all chemicals other than formaldehyde, ethanol, and glycerol/thymol to RACE.Surveycollections@noaa.gov. Special haz mats will not be allowed. They must conform to those that we are already using. FAILURE to disclose chemicals and hazardous materials will terminate your project.

None

(CLang Note: other choices: ethanol, formalin, other: blank)

**PERMITS**

It is the responsibility of the person making the request to obtain all the necessary permits required for the collection and shipment of specimens, and the RACE Division must have copies of the permits no later than 20 April 2014. Note that RACE Division survey efforts are currently covered under ADF&G Fish Resource Permit CF-10-038 for expected levels of whole specimens or samples taken. NO LIVE ORGANISMS, TISSUES, OR VIABLE GAMETES are currently covered by this permit and will need separate permit. Please direct any questions regarding permit coverage to a particular project to RACE Deputy Director, Frank Morado (206-526-6572).

**Permits issued or pending:**

ADF&G Fish Resource Permit CF-10-038 (update)

**SHIPPING INSTRUCTIONS**

In 2014: The EBS shelf, EBS slope, and AI surveys originate and terminate in Dutch Harbor, Alaska. Equipment and sample collections will be shipped to the requester from Seattle. We typically use FEDEX or Alaska AirCargo. Contacts and phone numbers of someone available 24/7 to discuss logistics and problems or authorize billings at the anticipated time of shipment (i.e., end of leg and end of survey). The person making the request will pay for all charges associated with shipping and storage including the following: 1) completed shipping company forms with the shipping account number 2) any additional packing materials such as zip lock bags 3) if samples are frozen, coolers or commercial waxed boxes must be provided.

**24/7 Contact Name**:\* Christie Lang

**24/7 Contact Phone Number**:\* 206-554-1755 (update)

**Detailed shipping instructions:** [NOTE: FedEx next-day shipping imposes some complications. If you are requesting this method of shipping, please make sure to plan carefully with the Survey Coordinator.]

Ship with RACE survey supplies