Green Crab and Tunicate Monitoring Coordination Meeting (DRAFT)

Kachemak Bay Research Reserve, Islands and Oceans Visitor Center conference room

June 12, 2007

Participants:

Amy Alderfer-Kachemak Bay Research Reserve, Acting Reserve Manager

Catie Bursch- Kachemak Bay Research Reserve, Education Assistant

Tammy Davis; ADF&G, invasive species program

Daniel Doolittle- Kachemak Bay Research Reserve, Research

Dan Gilson- PWSRCAC in Valdez

Judy Hamilton- Kachemak Bay Research Reserve, Fisheries Biologist, near shore issues

Deena Jallen- UAF-CES, AISWG program assistant

Lisa Ka'aihue; PWSRCAC, invasives

Denny Lassuy; USFWS, invasives

Linda Shaw- NMFS

Terry Thompson- Kachemak Bay Research Reserve, Education Coordinator

Participants met at the Islands and Oceans Visitor Center in Homer, AK. Judy Hamilton opened the meeting by handing out the 'Kachemak Bay National Estuarine Research Reserve State-wide Coordination of Community-Based Marine Invasive Species Monitoring Input Forum'. The eleven participants introduced themselves, and gave a presentation about the Kachemak Bay Research Reserve and the National Estuarine Reserve system.

Presentation notes:

National estuarine research reserve system monitors water quality, and is expanding to include biological monitoring. In Alaska, the research reserve coordinates with NOAA and ADF&G Sportfish division on research and education. The KBRR is non-regulatory, and focuses on the Kachemak Bay estuary, with research and education projects expanding beyond that geographical area. They work to integrate research and education.

European Green Crabs have been on the west coast of the US since the mid 1980's. They are relatively small, but are aggressive, and can reduce native crab populations. They are adaptable, and tolerate a wide range of environmental conditions. The Smithsonian institute (SERC: Smithsonian Environmental Research Center) has determined that green crab would be able to tolerate temperatures and salinity levels found in Kachemak bay (and other Alaskan areas).

In 2006 the KBRR developed and tested protocol for green crab monitoring efforts in area schools. In 2007, monitoring was expanded to Seldovia, and a graduate student in Peterson Bay also did some monitoring. Methods examined included trap type (pit, minnow and folding), bait, beach location, and site selection. Minnow traps were unsuccessful. Pit traps consist of buckets sunk into the beach. Although simple to deploy, downsides include inability to bait, crab cannibalism, trap theft (ooh! Free bucket!), and awkwardness for class use (students have to remove trapped crabs from the bottom of the bucket by hand, with silt making visibility very

limited). Minnow traps were found to be ineffective unless trapping is targeting very small things. Judy reported catching 250 crabs in folding traps, and 1 crab in minnow traps in the same area/time period.

Folding trap with mesh panels. Trap is about 2 ft long, and 1ft tall.

Folding traps were found to be the most effective. Dan Gilson has found a supplier of the traps in Japan. He modifies the traps by cutting mesh along the sides, and then sewing the mesh back together with cotton twine. The cotton twine will quickly degrade; reducing bycatch and continuous trapping if the trap is lost. KBRR and PWSRCAC also modify the traps by using zip ties to reduce the size of the trap mouth, preventing larger animals from being accidentally caught. Catie Bursch did trapping last year in April and October with four folding traps, and one pit trap. Bycatch included one of each; sea urchin, snail fish, barnacle, and sculpin, and 2 mussels.

Bait in folding traps is placed in a perforated tub. Canned bait (tuna, catfood), can be set in a trap after puncturing the can. Dan Gilson reported always using herring as bait (also suggested by Greg Ruiz in his studies). Judy Hamilton has used locally available salmon scraps for bait, which worked better than cat food. Canned foods can be very convenient for school groups and citizen monitors to use. Dan Gilson said that he usually stops trapping in late July and August. In Valdez, the salmon runs are high at that time, salmon carcasses are readily available, and traps catch very few crabs. Judy Hamilton has not found that to be a problem in Homer, which does not have a large influx of salmon.

For school classes, Catie found it helpful to have a minimum of 5 traps. Each student should have a 'job' to do while checking the trap. She has developed a kit of crab ID and sampling materials. Each group of 5 students gets a bucket kit, and a trap to monitor. The kit consists of a bucket labeled with is contents; tidepool guide, crab guide, clipboard with pencil, data sheet on waterproof paper, calipers, and pair of gloves. Students identify and count all contents of the trap.

The KBRR has a grant from ADF&G for the next three years. Their goal is to get a baseline for crab populations in Kachemak bay. There is a habitat types model for Dungeness crab. The Reserve will also continue to implement it education programs. The funding consists of $139,000 for the three years, the bulk of which will go to salary.

Tunicate monitoring

Tunicates are a colonial animal that reproduces by budding and gametes. They can alter benthic habitats by overgrowing native flora and fauna. The Smithsonian institute has an interest in monitoring fouling organism. Settling plates have been deployed in Kachemak bay for several years. The plates are set in summer, and retrieved in September. Organisms on the plate are then photographed, scraped off, preserved, and sent to SERC. Samples undergo genetic analysis in San Francisco. SERC scientists will be coming to KBRR in September to train identification protocol and refine photographic methods. They will also be refining the website to improve photographic identification. So far, there are 10 plates in Valdez, Dutch Harbor, Petersburg, Ketchikan, and Juneau(20 plates total in Juneau, 10 at cruise ship dock and 10 at Harris Harbor, 10 in Gustavus). Potential locations include Tatitlek, Cordova, and Whittier. Upper areas of Cook Inlet may be too silty for monitoring. Valdez has silt and a

freshwater lens that may interfere with monitoring. Potential monitoring sites include ferry terminals. Involving the ferry system could also help to streamline the process of transporting the settling plate-and-brick setup. KBRR is currently using a PVC plastic plate (about 15cm x 15cm) attached to a perforated brick. The plate is roughened on one side by a grinder, and attached to the brick with zip ties. The brick is then suspended from a dock or other structure.

Plates can be reused from year to year if thoroughly cleaned. Dan Gilson from PWSRCAC scrapes them clean, then soaks them in a dilute bleach solution overwinter.

Potential sites for monitoring include oyster farms, ferry terminals, and harbors. Denny Lassuy pointed out that it would be important to pick sites strategically, to avoid overwhelming SERC and KBRR with samples. Potential vectors for tunicates include hull fouling and ballast water. Oyster farmers in AK can move oysters within the state, and can also purchase certified spat from elsewhere. Non-sterile oysters can also be found from sterile shipments (not necessarily due to lax screening, but to life finding a way). Many oyster farmers have been very helpful and interested in habitat variables, and already allow researchers to install monitoring equipment on their floats. Judy Hamilton says that they are taking plankton samples and temperature readings from oyster farms. Another group to involve would be Harbormasters; their annual meeting takes place in the fall, and may be held in Homer this year. Locating sediment plates near ballast exchange areas may also be helpful. The bulk of ballast water exchanged in Alaska is from oil tankers, who are exempt from regulations. Other ships are required to comply with ballast water transfer regulations, but the Coast Guard does not verify actual compliance, only record keeping of ballast transfers.

State of Statewide Monitoring

Needs:

1. Central database/manager
2. Consistency in sampling
3. Maintenance of database
4. Web based resources (online ID guide, communication resources for volunteers, students, teachers, etc.)

KBRR has the resources for coordinating, training, equipment, ID guide, mapping, community contacts and data collection. They have contacts for travel and regional coordinators in Dutch Harbor, Prince William Sound and Juneau. They have storage space for traps and supplies, and function as the hub for SERC tunicate monitoring in Alaska. They might also be able to do the

same for Green Crab. In summary, KBRR has the capability and interest to serve as the facilitator of Green Crab and Tunicate monitoring efforts throughout the state.

Discussion

Daniel Doolittle opened the discussion by asking about what public outreach has been done to explain the 'so what?' questions of invasives. PWSRCAC, ADF&G, KBRR, USFWS all have booths/materials for community events. Earlier this spring, PWSRCAC hosted an invasive film festival at the Alaska Forum on the Environment. Soil and Water Conservation Districts, and other organizations involved with plants have been active in Alaska for several years. Awareness of invasive weeds hits people in their backyards. There is not uniform awareness about invasive species.

Judy Hamilton wanted thoughts on how training citizen monitors has been worked out. Dan Gilson said that it was not difficult. When he started in Valdez, he resumed work begun by the Smithsonian institute. He had 24 traps at 3 locations. It was overwhelming for the other communities to maintain that level of effort. In Kodiak, the trapping locations are 10 miles out of town, and Dan trained 4 high school students. In Tatitlek, he found 16 traps and 12 kids to be more manageable. Denny Lassuy brought up the issue of statistically significant trapping. How many traps would be needed to validly estimate populations of native crabs, or to monitor for presence/absence of green crabs? Dan Gilson noted that the 3 Valdez locations were spread out, and they were trapping in the port. Judy Hamilton mentioned that they had been putting out 20 plates for tunicates, but on recommendation from SERC, they reduced their efforts to 10 traps, so presumably SERC has done some of the research to figure out adequate effort for tunicates, at least.

From an educational perspective, Catie Bursch pointed out some of the considerations of working with school groups and kids of different ages. In elementary school, students often have a whole day with one teacher, and can go on field trips more easily than middle school students, who have 50 minute class periods. Also, for younger kids, they quickly get wet, cold, and muddy, and packing them all into a bus and going to another sampling site is unfeasible. High school students may have more freedom of movement and travel, and may be able to get out of class to work on a monitoring project in a small group. It is also important to have enough traps, so that kids are not left out.

For doing citizen monitoring, the number of traps and where set will have to take into consideration outreach/education, and effective monitoring. One tool that will be helpful in site selection will be the Shorezone habitat assessment study.

Linda Shaw said it should be done in early July. The Shorezone project is an ongoing habitat mapping project in the state of Alaska. It was started by Sue Saupe, and takes data from photo imagery from super tidal to subtidal at the lowest tides. The habitat modeling looks at geo-morphology, sediment type, wave exposure, and bio-banding (kelp band, etc.). In Auke Bay, researchers have also added data on fish species. Visitors to the web site can select area of the coastline, and see flyover images. Jodie Harney asked Sylvia Yamada for advice on modeling data. Jodie combined green crab habitat data, and the ShoreZone habitat data using the Delphi approach and queried the ShoreZone database to find which areas would be suitable green crab habitat. The model will include surveyed areas from Washington and British Columbia, where populations of green crab already exist, so the model will be tested against to see if it predicts areas where green crab have been found on the west coast. Lisa Ka'aihue said that the Prince William Sound data is not quite all done, they still needs to some of the flying, which should be done by October.

Of primary interest to PWSRCAC are issues of ballast water and hull fouling. Citizen monitoring is their #1 priority. They have funding from the USFWS to do monitoring in 10 communities. To meet this goal, they need to set up monitoring in Seward, Chenega Bay, Whittier, and Ketchikan. They currently have sites in Valdez, Cordova, Tatitlek, Kodiak, Dutch Harbor, Homer and Seward. In most of these communities, they have liaisons in place. The funding from the USFWS should be good for 5 years, and will help the RCAC to fulfill mutual priorities. Terry Thompson thinks that reaching the additional communities would be doable. The KBRR has monitoring protocols, however, they may be short staff. Ketchikan would be an easy community to start monitoring in, and there are enthusiastic coordinators in Dutch Harbor (Reid Brewer), Cordova (Allen Marquette), Tatitlek (local teachers), and Whittier (Jane Osmond).

Needs

Dan Gilson said that a 'one-stop-shopping' location for ID material is necessary. He has a pretty good book (Pacific Coast Crabs and Shrimps). Catie Bursch has lists of crab species in Kachemak Bay, and can do scientific illustrations, which are especially helpful in showing identification markers. A printed guide should show commonly encountered species, and specific invasive species, with additional resources online. Deena Jallen could add a crab monitoring section to the AISWG website with links to resources, and pages on crab identifications. More complicated web resources, such as online communities and databases would probably need to be subcontracted out. Funding may be available from ADF&G or PWSRCAC to fund website development.

Green crab models, or specimens in acrylic blocks would be very helpful for showing monitors what they are looking for. Sylvia Yamada may be a good contact for such models, as well as Jason at ClearBio . Jason has recently e-mailed Linda Shaw with a price list, which she has forwarded to a number of meeting participants. It is difficult to train citizen observers to find something they have not seen before. Ideally, in a school setting, the program would tie into five classes on crab life cycle, classroom identification exercises, and then field work. Dan Gilson from PWSRCAC uses an ice cube tray to represent the ballast compartments in oil tankers. He finds it is easier to work with small groups, and then they can explain things to the other kids. He has been doing more 'train the trainer' type work.

An issue with tying green crab monitoring into school groups is the timing. Trapping would ideally take place in the summer. Alternate resources for observers might be retired naturalists, and native or village summer programs. Catie Bursch pointed out that in villages, where teacher turnover is high, getting volunteers from tribes and villages would be a good idea.

Tunicate plates

Tunicate sites so far are in Dutch Harbor, Homer, Valdez, Cordova, Gustavus, Juneau, and Yakutat. Linda Shaw got $15,000 though Corp of Engineers mitigation projects to do invasive species monitoring on a new dock in Ketchikan. She has been working with Gary Freitag, who would be an excellent contact in that area. Where possible, it would be advisable to combine green crab and tunicate monitoring in order to save on travel costs.

Tunicate data has been mailed from communities to Dan Gilson. He then packages and sends the data to ADF&G for permitting requirements, and also sends the data to Greg Ruiz. So far, the community monitors have not expressed an interest in seeing the results of the monitoring. Lisa Ka'aihue with PWSRCAC has contracted out database programmers in the past to do user-friendly queryable databases. She feels that as long as the data is tied in with PWSRCAC goals, it would be a good use of their resources to have the data available online. Susan Harvey used

ASP pages, and PWSRCAC continues that contract for site upgrades. The literature data base is queryable by port, species, and author.

Permitting

Judy Hamilton mentioned that getting a blanket permit for sampling would be great. Tammy Davis will look into the requirements needed to do a broad permit for sampling associated with this project. Dan Gilson said that the current permits specify sites, but initially, the sampling sites will not be known. Tammy responded that adding people and locations to permits is not hard, but that getting the initial permit can be an ordeal. Bob Piorkowski with ADF&G handles permitting. One option may be to look into giving power to amend a permit to regional coordinators. So far, Cordova, Chenega Bay, and Tatitlek are lumped under one permit. Dan Gilson may be able to get sites established before September.

Involvement and Coordination

Lisa Ka'aihue would like to see the communities involved in the monitoring keeping up their involvement. Daniel Doolittle and the KBRR can assist by taking on the role of regional coordinator. Terry Thompson from KBRR can take over training this summer for Seward, Chenega Bay, Whittier, and Ketchikan. Chenega Bay is in Prince William Sound, and either it or Whittier would be a good location for co-training between PWSRCAC and KBRR. Prince William Soundkeeper will also be a good organization to coordinate with, their executive director, Jennifer Gibbons, has expressed interest in getting coordinated monitoring efforts up and running.

Judy Hamilton sees the KBRR acting as a state coordinator. They would collect all the data from the regions, and would support regional trainers. They have facilities to store and assemble sampling equipment. Tammy Davis and Daniel Doolittle confirmed that this would tie in well with ADF&G's missions. Sustainability will be important. At the end of 3 years, the project will be easier to keep funded.

Funding

Tammy Davis said that ADF&G funds would likely not be available until September. Lisa Ka'aihue said that PWSRCAC should be able to supply funding before then to get things moving. What she is hearing is that there is a need for bridge funding, and then in the September, ADF&G will likely have money to continue the project. In order to supply funding, PWSRCAC will probably use an MOU as a mechanism to transfer funds.

Other funding considerations will be for website work. Deena Jallen will look into costs of expanding the AISWG website to include crab identification materials, and costs of database/communication resources. PWSRCAC might fund database work, especially if it incorporates PWSRCAC data.

Future Considerations/Plans

Linda Shaw would like to see monitoring efforts tied into the green crab habitat suitability models. NOAA has a strong interest in doing statistically sound monitoring efforts. Denny Lassuy said that one of the greatest values in having citizen monitoring will be to have an educated, engaged public. Catie Bursch pointed out that most likely, the first green crab in Alaska will not be found by a scientist. Citizen monitoring needs to start out as simple projects with realistic goals and expectations. Once the program is solid, then additional data collection methods can be added based on what data will be the most important and feasible to collect (salinity, temperature, etc.). Number and placements of traps can also be revisited, but initially, monitoring will likely take place in areas that volunteers can easily access.

One of the main questions concerns what can be done once green crabs are found in Alaska. Linda Shaw mentioned that there are eradication efforts under way in Bodega Bay in California. They are doing well, and examining using pheromones (They are being funded by the Pacific States Marine Fisheries Commission. The eradication effort is being done by Catherine de Rivera, Portland State University, Greg Ruiz, Smithsonian, Edwin Grosholz, University of California, and Mark Systma of Portland State University, and the pheromone work is being done by Sylvia Yamada of Oregon State University).

For this summer, important resources will be training materials, traps, and volunteers. Dan Gilson and Catie Bursch already have significant resources in these areas. PWSRCAC has 40 traps in Valdez. KBRR has 10 traps at least, possibly as many as 25, enough for the Kachemak Bay area. It will take 6 weeks to order new traps. Lisa Ka'aihue will look into buying traps for Southeast Alaska soon using USFWS funds, so monitoring can be done this summer. Dan Gilson estimates that each community will use between 16 and 24 traps, depending on the size of the community.

Judy Hamilton suggested possibly starting each community with half as many traps this summer, and then focus on full trap deployment next summer. Dan Gilson recommended getting 12 traps for Chenega Bay, 16 each for Whittier and Seward, and also traps for Juneau. Focusing on full trapping next summer will also allow for more funding being in place from ADF&G, crab guides should be available for more areas, use of the habitat suitability model to assist in site selection, and for more blanket permitting, instead of getting piecemeal permits. This summer it will be useful to get volunteers and coordinators engaged, and to scout out available sites. This winter, work can focus on expanding educational materials, and shipping out additional traps for a full trapping effort next summer.

Regional Coordinators

Prince William Sound (Valdez, Cordova): Dan Gilson, Fran Lathan (Yakutat)

Southcentral (Homer, Seward, Kodiak): KBRR

Southeast (Gustavus, Juneau, Sitka): Linda Shaw

Bristol Bay/King Salmon: unknown. Gets a lot of shipping traffic, monitoring would be important.

Southwest (Dutch Harbor, Akutan, Sand Point): Reid Brewer

Train the Trainer Sessions

Location: Whittier (or TBA)

Date: July 30, 31, or August 1. Depends on low tides and personnel availability.

Southeast: Judy Hamilton and Linda Shaw will follow up contacts in Sitka and Ketchikan and look into planning a meeting for trainers.

Monitoring, Additional contacts

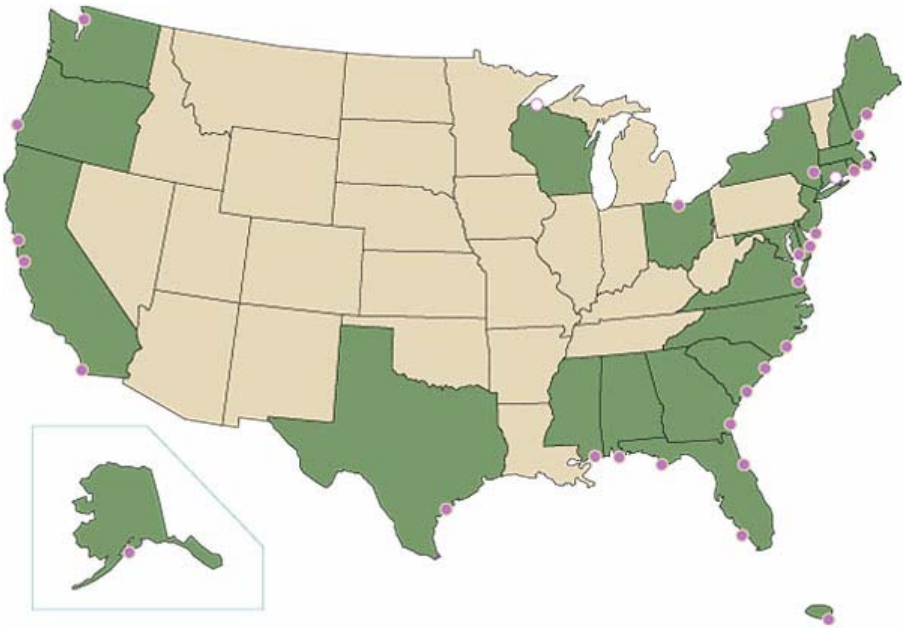
Tunicates plates should be set out in June. Train the Trainer sessions can set out plates late this summer in preparation for next summer. Linda Shaw will talk to Whitney Rapp in Glacier Bay to see if she can set up traps in addition to tunicate plates.

Crab identification information needs to be put together for Whittier, Seward, Chenega Bay area, and southeast communities, including Juneau, Ketchikan, Gustavus and Sitka.

Additional Resources

National Estuarine Research Reserve System

http://www.nerrs.noaa.gov/welcome.html



http://www.nerrs.noaa.gov/Reserves.html

Smithsonian Environmental Research Center

www.serc.si.edu/

Projecting Range Expansion of Invasive European Green Crabs (Carcinus maenas) to Alaska: Temperature and Salinity Tolerance of Larvae
1 Febuary 2004, Research Report
Submitted to: Prince William Sound Regional Citizens' Advisory Council
Submitted by: Anson H. Hines, Ph.D., Gregory M. Ruiz, Ph.D., Natasha Gray Hitchcock, M.S., Catherine deRivera, Ph.D.

serc.si.edu/labs/marine_invasions/publications/PDF/RCAC_Green%20Crab_Final_2004.pdf

Alaska Association of Harbormasters

http://www.alaskaharbors.com/index.html

2007 Annual Conference date and location not yet announced.

Coastal and Oceans Resources Inc.

http://www.coastalandoceans.com/

ShoreZone coastal Habitat mapping

http://www.coastalandoceans.com/shorezone.html

http://www.coastalaska.net/

Crab ID Book: Pacific Coast Crabs and Shrimps

Gregory C. Jensen, Published by: Sea Challengers (February 1, 1995)