

Application for an exempted fishing permit to conduct a limited flatfish fishery inside the Red King Crab Savings Area and Area 516 closures to evaluate potential for reducing crab and other PSC bycatch

Date of Application: September 2015

Requested permit dates:

February 1 through May 31, 2016 and January 20 through June 15, 2017

Applicant Information:

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EFP vessel information: If approved, up to five Alaska Seafood Cooperative (AKSC) member vessels would be authorized to participate in this EFP. Prior to the final issuance of this permit, AKSC will provide a list of the vessels selected for the EFP including a list of alternate vessels in the event that one or more of the selected vessels are unable to participate.

Statement of Purpose:

This EFP proposes to collect data on crab bycatch rates during commercial fishing operations on five groundfish fishing vessels (targeting mostly flatfish) inside the Red King Crab Savings Area (RKCSA), the Area 516 seasonal closure, and adjacent areas that are currently open to non-pelagic trawling. The principle objective of the EFP is to evaluate whether flatfish and other groundfish trawling in the above-mentioned closed areas under the existing bycatch caps would increase or decrease bycatch rates and the overall catch of managed crab species. Many flatfish fishermen feel that access to these closed areas could actually result in lower crab and possibly halibut bycatch usage.

While principally focused on crab bycatch rate comparisons, other pertinent information on managed crab species from inside the closures and adjacent areas in the winter and spring months (e.g. sex and size) will be collected. Additionally, EFP vessels will install sensors provided by the Alaska Fishery Science Center's (AKSC) Kodiak laboratory to collect temperature and possibly other data relevant to the understanding of preferred habitat conditions for managed crab species.

Assuming our preferred timing for approval and issuance of the permit, EFP activities would occur from February through May 31, 2016 and again from January 20 through June 15, 2017.

This project is expected to help crab and groundfish scientists/managers, industry, and the interested public better understand tradeoffs for maintaining or modifying current closure areas. No additional crab catch allowances are requested for this EFP and participating vessels will operate in the EFP using their own Amendment 80 allowances while fishing inside and outside the closures.

The EFP data will be analyzed following each of the two EFP field seasons and a short summary of preliminary findings will be provided to NMFS/NPFMC at those times. AKSC will also hold a meeting with the commercial crab sector and participating EFP flatfish captains to discuss the preliminary results following each field season. A comprehensive draft final report will be prepared following the completion of the two field seasons. That report will detail the objectives, methods, and findings. Potential recommendations for any future research or modifications to crab bycatch management measures will also be made, as appropriate, in consultation with the commercial crab industry input. The permit holder will be available to present the findings at a NPFMC (Council) meeting if requested. The draft final report will be modified based on feedback from NMFS and the Council and its advisory bodies and following that, the report will be submitted to NMFS and the Council in final form.

Background:

The RKCSA was implemented in 1999 and the Area 516 has been in place even longer (effective date of the Area 516 seasonal closure is not known at this time). Since the late 1990s, changes in the stock status and distribution of the major Bering Sea crab stocks have occurred, as seen in the annual trawl surveys and stock assessments. Bycatch avoidance incentives/practices for Bering Sea flatfish fisheries have also evolved over the same period, mainly due to the Council's approval of Amendment 80 (2008).

Data on the distribution of managed crab species within and around the crab closure areas in the winter and spring (when rock sole and yellowfin sole fishing takes place) has not been evaluated since implementation of the closure areas. Recent annual trawl surveys show that Bristol Bay RKC stock is currently concentrated mainly east of the RKCSA (mostly in the Bristol Bay closure), at least in summer when the surveys occur. RKC are known to move seasonally in response to changes in water temperature and ice edges, and the summer Bering Sea trawl survey may not be reflective of crab biomass locations during the winter and spring when flatfish fisheries are occurring.

From the perspective of flatfish fishermen, the RKCSA and 516 closures limit the ability of the Amendment 80 sector to follow the dense schools of target flatfish species as they make seasonal movements across the eastern portion of the Bering Sea shelf. From the sector's experience,

bycatch is minimized when fishing concentrates on dense aggregations of target species, allowing for shorter tows and cleaner results.

Bycatch is also minimized when a fishery is highly incentivized to reduce bycatch. Amendment 80 vessels have operated under individual bycatch limits since 2008. The sector's fishermen now carefully monitor their crab and other PSC bycatch rates and move vessels to alternative grounds when rates spike. They also share crab and halibut bycatch data and employ test tows to evaluate a new fishing location to ensure that bycatch rates are low before they make any commercial scale tows. Using these tools, AKSC fishermen have consistently stayed well under their crab catch allowances since the start of Amendment 80.

Conceptually, closed areas would reduce the Amendment 80 sector's ability to avoid bycatch if red king and other crabs are in fact less abundant in the closures relative to open areas at times when fishermen would fish inside the closures. To evaluate the potential for that to be the case, data collected by groundfish observers on flatfish and cod vessels adjacent to and inside a portion of the closures was examined. These data are relevant because some flatfish fishing occurs in the southern portion of the RKCSA, the area commonly referred to as the 10-mile strip. Flatfish fishermen can access this area in years when the RKC stock is above a regulatory abundance threshold.

The table below provides annual RKC bycatch rates across all AKSC member vessels that fished for rocksole and yellowfin sole from 2008 to 2015. Looking at the differences in rates from year to year it is evident that rates are quite variable. Overall, however, it appears that on average from 2008-2015 RKC bycatch rates for AKSC vessels (number per MT of groundfish) in the 10 minute strip are actually pretty similar for the period compared to the two statistical areas adjacent to the RKCSA. Of note, however, is that rates inside the 10 minute strip were actually dramatically lower in some years, particularly for fishing in the yellowfin sole target in Statistical Area 516 and 509. This could be indicative of times when fishing inside the closure areas would make sense and lower bycatch usage could be achieved in this manner.

In considering these data, however, it is also important to keep in mind that the table compares bycatch rates in the relatively small 10-minute strip area (approximately 100 square miles) to a rather broad adjacent area. Rates in portions of the large statistical area adjacent to the 10 minute strip actually vary considerably by location. Some specific portions of the area adjacent to the RKCSA have had bycatch rates that are considerably higher than the average for the overall statistical area. So potential for achieving lower rates inside the RKCSA could actually be larger than ones seen on average in the table. One must keep in mind, however, that the "inside" rates in the table actually only cover the portion of the RKCSA and relative abundance of RKC in the portion of the RKCSA north of the 10 minute strip may differ.

Inside/Outside Red King Crab Savings Area Rates - # RKC/MT groundfish									
Year	Stat Area 509				Stat Area 516				
	RockSole		Yellowfin		RockSole		Yellowfin		
	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside	
2008	0.5	0.3	0.2	1.0	1.1	1.5	0.0	15.1	
2009	0.5	1.1	0.2	0.4	1.5	2.1	0.6	0.4	
2010	0.4	0.5	0.2	0.3	1.0	0.8	1.5	0.4	
2011	0.4	0.3	0.1	0.2	0.7	0.5	0.1	0.7	
2012	0.3	0.2	0.0	0.1	0.4	0.4	0.0	0.2	
2013	0.2	0.2	0.1	0.1	0.4	0.1	0.2	0.2	
2014	0.4	0.3	0.0	0.2	0.7	0.4	3.1	2.6	
2015	0.1	0.1	0.0	0.0	0.5	0.6	0.3	0.1	
Average	0.3	0.3	0.1	0.3	0.8	0.7	0.4	0.4	
Note: Average in each column is sum of all RKC 2008-2015/sum of all groundfish 2008-2015									

The above is probably best seen as “suggestive evidence” that the closure areas may not be accomplishing its intended purpose and that allowing captains the flexibility to access the area when it makes sense could achieve savings in red king crab and possibly other PSC relative to status quo. Under this scenario, bycatch caps alone might be sufficient for managing crab bycatch. This would allow fishermen to select fishing areas with the highest target catch rates and lowest PSC rates from the overall area occupied by their target species.

A dedicated effort to collect information on bycatch rates inside and adjacent to the closed areas would provide a basis to evaluate whether crab and other PSC rates and target species are higher or lower in the closed areas. It would also provide information to fishermen about the feasibility of fishing in the area. Data on sex and size of crab that are caught in the closed areas and how this compares to adjacent areas would help inform the value of the closed areas in terms of crab management, and increase scientific knowledge about crab distribution during a non-survey time of year. Finally, temperature and other ecosystem data of interest to crab scientists will be collected to enable them to look at crab bycatch on a finer spatial basis and in the context of physical features like thermal fronts and ice edges.

EFP Design

This EFP is specifically designed to be a small-scale “pilot study” to collect bycatch rate information and other data on a limited number (five) of flatfish vessels permitted to fish inside the closures. For context, the five vessels that will be participating in this EFP comprise

approximately 20% of the Amendment 80 fleet (by number) so the EFP represents only a relatively small portion of the fleet.

Given the unknowns of fishing inside areas that have remained closed for more than 15 years, the EFP is specifically designed to be low-risk in terms of implications to crab populations. EFP participants will utilize their existing target species and PSC allowances for the EFP. This prevents an increase over what is currently analyzed under the annual groundfish specifications from the project because the PSC allowances for the participating AKSC vessels have already been accounted for in the annual specifications and total annual bycatch amounts are incorporated into stock assessment models. Most importantly, if EFP participants are able to effectively follow flatfish schools, then crab and other bycatch could actually be reduced relative to what would have occurred without the EFP. The information collected will nonetheless be valuable for the basic question of whether bycatch rates are higher inside the closures and could help inform any future survey efforts.

The EFP will be in place over two winter/spring seasons to increase the chance that data collections will take place in different environmental conditions which are expected to affect crab and flatfish abundance/location.

To ensure data are available for valid comparisons of catch rates inside and outside the closures, participating vessels will fish both inside and in adjacent areas outside the closure areas (as proportionally as possible) over the course of their Zone 1 rock sole and yellowfin sole fishing each year of the EFP.

Any non-pelagic trawl fishing inside the closed areas requires an exemption from current regulations and this type of temporary exemption is typically granted through an exempted fishing permit instead of a change in the regulations. AKSC has demonstrated the ability to collect credible and informative data through EFPs.

While clearly not the same as a survey in terms of sampling design and comprehensiveness, the EFP will be informative in terms of providing better data to consider crab distribution, etc. at a time when no systematic data are available for this purpose. Given that EFP vessels will be engaged in commercial fishing, however, results should be considered in the context of providing useful inferences about distribution/abundance of crab inside and outside the closures. In that context, one of the chief limitations to this study is that data will only be collected where flatfish fishing occurs. Also, EFP fishermen will be seeking high flatfish catch rates and minimal crab bycatch in operations both inside and outside the closures. A survey would collect data differently, likely with a stratified random sampling approach covering the entire area.

A systematic protocol will be used to collect information on crab bycatch rates on the participating EFP vessels. To address some of the limitations of collecting data from flatfish vessels engaged in fishing, the EFP includes steps to make the data more rigorous and less

subject to variability that is not from differences in crab abundance. First, participating vessels will carry additional data collection personnel (sea sampler(s)) during all EFP operations to fully account for crab catches census of each managed crab species) in the closure areas and adjacent areas. These sea samplers will be individuals with the same training/certification as groundfish or crab fishery observers. The principle duties of sea samplers will be to separate crab by species and then count and measure individual animals and determine sex, assess shell condition, other duties (need input from Bob Foy and CPT here).

Crab bycatch data will be collected under the procedures of the EFP for all trips by the EFP vessels during weeks of the year covered by the EFP for any of the fishing done in the area covered by the EFP (see description of EFP area below).

A full census of crab catches will be collected by the sea samplers for all tows by EFP vessel inside and in adjacent areas outside the RKC Savings/516 Areas. Taking a census avoids the problem of variability in rate comparisons resulting from sample size. While observer sampling is designed to be random to avoid bias, practical limitations affect the size of the sample collected. For example, observers typically collect a total sample weight of approximately 300 kg in several subsamples from a given tow and flatfish hauls typically range in weight from 20 to 40 MT. This means that sample size of roughly 1.5% to 0.75%.

Using a census of crab catches for purposes of the EFP allows the project to reduce the imprecision associated with comparisons of haul-specific catch rates. This is important because crab can be a very minor component of the total catch and their occurrence in flatfish hauls can be infrequent. In this regard, collecting a census of crab catch by species is expected to greatly improve the strength of catch rate comparisons for this project.

Vessel-specific factors such as ground gear, horsepower, or towing characteristics are known to affect bycatch rates. To help ensure differences in bycatch rates are as attributable as possible to differences in relative abundance rather than fishing gear used, the vessels participating in the EFP will maintain their same ground gear during the EFP while operating in the closed areas and adjacent areas (see definition of geographical extent of operational area for the EFP). This includes refraining from making changes to the footropes, set back, fishing line, bridles, doors and other relevant components of the trawl for the duration of their activities during this EFP. Careful documentation of doors, bridles, sweeps, ground gear components, etc. will be done by the participating vessel captains at the outset and during the EFP. This is needed to ensure that if any of the above components become loose, stretched, or damaged during the EFP, repairs will be made in a manner that comes closest to establishing the same gear configuration that was in use prior to the damage.

To ensure the data collected are useful for comparing bycatch rates inside and in the adjacent area outside the closures, each EFP vessel will need to fish inside and outside as proportionally

as possible on an overall basis as well as within trips. This is important because vessel-specific catch rates are expected to be the most useful for catch rate comparisons and dividing the fishing as evenly as possible on a trip-specific basis will help ensure the data are still relevant as factors change over the season. Factors outside the control of fishermen will affect the ability to fish proportionally (e.g. ice location, distribution of target fish species) but when signing up for the EFP, captains will agree to distribute effort as proportionally as possible given the factors that are under their control.

In the analysis phase of this EFP, we will look at catch rates on different EFP vessels when fishing proximally to each other to evaluate the degree to which “vessel effects” on catch rates are present in the data. Depending on what is found, we may be able to include comparisons in bycatch rates for different EFP vessels. This would increase our ability to compare rates over time because it would expand the data spatially for comparisons of catch rates over time.

No additional bycatch allowances will be needed to conduct this EFP. The five authorized EFP vessels will operate using the normal Amendment 80 crab and halibut bycatch allowances available through their company’s participation in the AKSC. These allowances will apply to all EFP and non-EFP fishing during the year. Total AKSC catch is capped by an annual allocation and each AKSC member company has an annual cap on crab bycatch for each crab species managed by caps (Zone 1 *C. bairdi*, Zone 2 *C. bairdi*, RKC, and *C. opilio* inside the COBLZ). Companies assign these allowances to their EFP and non-EFP vessels as needed but cannot exceed them and must acquire more from other AKSC member companies in the event that they reach their company-specific allowances and wish to continue fishing. However, total AKSC catch is capped by an annual allocation.

The information collected about bycatch and target catch rates is intended to allow for a comprehensive look at bycatch rates inside and outside the closed areas. To provide other useful information about the feasibility of fishing in the closed areas, the EFP holder will conduct informal interviews of participating captains. Questions used during these interviews will enquire into tradeoffs of fishing in the areas if regulations were changed to allow access to all or parts of the closure. The interviews will also be asked about ancillary factors such as encounter rates with derelict crab pots, groundfish catch rates, degree to which bycatch avoidance efforts are needed inside the closures (relative to outside), and other factors of interest to understand the potential for modifications to the closures to address both bycatch reduction objectives and fishing efficiency. Additionally, informal interviews will be conducted with members of the commercial crab industry (trade association representatives, captains, etc.) in order to gather and understand their thoughts and perspectives on all the information collected.

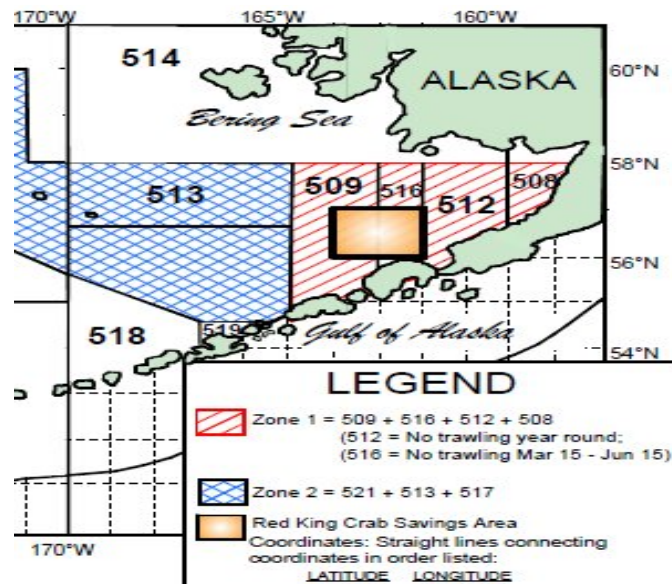
Geographical Area of operations for this EFP

To achieve a meaningful assessment of the differences in crab bycatch rates between the rates in the closure areas and in adjacent areas, it is critical to define what is meant by “adjacent” to the closures so as to include only areas where useful comparisons will be made. For comparability reasons, the adjacent areas against which rates inside the closures will be assessed need to be the same general depths and types of substrates as the ones found in the RKCSA and Area 516 closures. These are the depths and substrates that are within the range of ones generally used by the red king crab and possibly *C. bairdi* (with an emphasis on RKC which is the underlying objective of the crab closed areas of interest for this EFP). For example, comparing crab bycatch rates inside the closures to rates in areas on the slope where Arrowtooth flounder fishing occurs would probably be almost meaningless.

After considering on this issue, it was decided that the fishing outside the closures that will be deemed to be adjacent and therefore be part of the EFP for purposes of comparisons will be limited to that which occurs in NMFS Statistical Areas 509 and 516 only.

To illustrate how the geographical extent of the EFP was arrived at, it is useful to consult the figure from Part 679 of the groundfish fishing regulations which is reproduced below. The figure (Figure 11 from the 670 regs) shows the statistical Zone 1 for management of crab bycatch in the Bering Sea and its numbered NMFS statistical areas. The RKCSA is also shown in the figure. The depths within NMFS crab bycatch management Zone 1 are generally in the 40 to 120 meter range comprising Stat areas 509, 516, 512, and 508. Stat areas 508 and 512 make up the Bristol Bay area and are closed to trawling year round. The RKCSA occupies part or Stat areas 509 and 516. The area within 509 and 516 that are open to trawling year round or seasonally (in Statistical Area 516 from January 20-March 15 and June 15-Dec 31) are comparable depths and substrates typical of the Bering Sea shelf to the RKCSA. The other areas in Zone One are shallower and closed on a year-round basis to non-pelagic trawl fishing so therefore not useful for comparative purposes.

Figure 11 to Part 679. Red King Crab Savings Area (RKCSA).
Red King Crab Savings Subarea (RKCSS) is that portion
of the RKCS between 56°00' and 56°10'N.



EFP Objectives

- 1) Assess the feasibility of flatfish fishing inside the RKCSA and Area 516 closures under existing bycatch allowances and implications for potential savings in crab bycatch.**
- 2) Collect and analyze crab bycatch rate data in and around the RKCSA and Area 516 to evaluate implications on bycatch rates/usage under current conditions if modifications to the closures are considered.**
- 3) Collect information on sex/size of crab and other biological data of interest from crab taken as bycatch during the EFP**
- 4) Collect temperature and other ecosystem monitoring data during the EFP to improve the collective understanding of preferred habitat for managed crab species.**
- 5) Work in conjunction with the BSAI commercial crab sector to ensure mutually beneficial fisheries management solutions.**

EFP catch handling and data collection procedures

For purposes of in-season accounting and management of the participating AKSC vessels, tracking and accounting for target and PSC species during the EFP will be done using the exact same Amendment 80 procedures and data as currently occurs. Species composition sampling by the normal Amendment 80 observers will be used to track the target and PSC catches of participating vessels against their Amendment 80 allowances.

To avoid affecting observer sampling duties, expanded crab data collection will occur after the catch passes over the vessel's flow scale and the observer has had the opportunity to sample unsorted catch for all Bering Sea EFP hauls.

Crab data collections will occur as follows:

1. In a suitable location on the conveyor belts after the vessel's flow scale, crew members will remove all crab (including any parts of crab) of all species from each haul.
2. Crab will be placed in a tote or other suitable designated container provided by the EFP vessel for the sole purpose of collecting all crab from each haul.
3. The haul number will be indicated on the tote/container using a system developed at the start of the EFP by the sea samplers, observers, and the factory foreman and other responsible crew members.
4. Sea samplers will have the same training and qualifications as NMFS certified groundfish or State of Alaska crab observers.
5. Sea samplers will be employed through the observer provider companies authorized to provide observers for the regular Amendment 80 fisheries or companies providing crab observers.
6. Any crab or crab parts collected by observers during their normal sampling duties will need to be accounted for in the census of crab for purposes of this EFP.

7. Following their normal observer duties and under system that is mutually agreeable to the sea samplers and observers, observers will place any crab or parts of crab from the haul into the specific tote/container being used for that haul.
8. A short briefing to explain the EFP procedures and data collection protocols will be done on EFP vessels at the outset of the EFP and when new observers begin on EFP vessels. The sea sampler in charge of EFP data collections on the vessel will conduct this briefing.
9. Participating vessels will provide an additional work area for the sea samplers that is sufficient for them to conduct their duties without negatively affecting the work area for observers.
10. After all crab are collected from a haul, the sea sampler on duty will separate the crab by species and count and record the number of crab by species. Length and sex data for each crab will also be collected and recorded. (Does Dr. Foy or CPT want weight data collected, if so how?).
11. Using the normal chute used on the vessel to return PSC to the water, sea samplers will discard the crab from each haul following their data collections. Note: Does AFSC want us to collect any tissue samples for the crab assuming the workload of sea samplers will accommodate some?
12. Sea samplers will record their data on data sheets developed by the EFP holder. Sea samplers will enter their data onto spreadsheets also developed by the EFP holder. Samplers will perform data quality checks of all data following procedures developed by the EFP holder. Data will be periodically transmitted to the EFP holder by the sea samplers.
13. Data collected by sea samplers are not for in-season catch accounting and will be used only for the purpose of the data analysis for the EFP.
14. All equipment needed for the sea samplers to perform their duties will be provided by the EFP holder and participating vessel. Note on the issue of survival suits for sea samplers who will later become observers needs to be addressed here, hopefully FMA will allow the same arrangement as for the deck sorting EFP).

Responsibilities of EFP vessel captains/mates and crews

Captains and mates of participating vessels will:

1. Record all tows as EFP tows in the logbook whether inside or outside the closed areas for any Bering Sea flatfish hauls during the time when the EFP is in place.
2. Record as “inside” in the EFP spreadsheet used for purposes of the EFP any tow that fishes inside the RKCSA or 516 closures
3. Provide set and haulback locations for all Bering Sea groundfish hauls during the EFP (can we ask for plotter data?)
4. Make a drawing/diagram of the ground gear they will use for the EFP before starting EFP operation each year and list the ground gear, trawl doors, bridles, sweep lengths components and configurations that will be used for the EFP

5. Agree not to change any of the listed gear for any Bering Sea groundfish haul during the EFP and agree to repair/adjust the gear to that it maintains the original configuration it had when the EFP began
6. Agree to, if damaged, make repairs to the gear listed above to return it to as close to the original specifications as possible.
7. For each target fishery (e.g. rock sole, yellowfin sole) during the EFP, fish inside and outside the closures in as proportionally equal manner as possible. Note: if relatively high bycatch rates for crab are encountered inside the closures in any given target fishery, participating vessels will not be required to fish in equal proportion inside the closed areas.

Project management responsibilities for the permit holder

As permit holder, AKSC, through its principal investigator John Gauvin and other authorized personnel, are responsible for:

1. Ensuring that EFP procedures are followed correctly and data integrity meets the needs of the EFP. This will be accomplished mainly through communications with sea samplers hired for the project and regular review of the data provided by the samplers.
2. AKSC will remain in regular communication with vessel captains and mates to review any problems with the gear or fishing procedures or the data collection practices/protocols. AKSC and participating vessels and sea samplers will work out solutions to any problems that occur.
3. AKSC will, if necessary send a field project manager on an EFP trip to develop procedures to ensure that data quality is achieved.
4. In the event that an EFP vessel is unable or unwilling to follow the procedures of the EFP, AKSC can remove the vessel from the list of authorized EFP vessels. At its discretion AKSC can elect to start another approved EFP vessel in the place of the one that was removed for the EFP or opt not to do so.

Exemptions to the Amendment 80 and other regulations needed for this EFP:

1. EFP vessels will need to be exempted from the closures during the active period of the EFP
2. EFP vessels will need to be exempted from the regulation that requires PSC species to be returned to the water as soon as possible (while allowing the PSC to be available to observers)
3. EFP will need the allowance to request that the EFP vessel's regular observers assist the project by placing any crab in their samples into the specific tote or other container used to collect the crab marked for that specific tow. Procedures for doing this will be developed by the sea sampler and the observers on the vessel prior to fishing operations on all EFP trips.

Provisions for public release of data and information from EFP and required content for interim and final EFP reports:

Interim reports following each field season will describe the general outcome in terms of meeting the data collection objectives of the EFP and summarize the number of Bering Sea fishing days and catches of EFP vessels inside and outside the closures including catches of managed crab species and other PSC inside and outside. Preliminary information on size and sex as well as other biological data on crab taken as bycatch in the closed areas will be provided in the interim reports to the degree it is available. The permit holder will also provide a preliminary assessment of the feasibility of fishing inside the closures relative to outside during that field season based on communications with vessel captains.

For the draft final report, the permit holder will analyze the bycatch rate data by hour, distance towed, and per ton of groundfish catch. The primary comparison analysis will be based on same vessel catch rates inside and outside the closed areas. Should the analysis show that catch rates for different EFP vessels operating in the same area/ time are sufficiently consistent, then comparisons based on catch rates by different EFP vessels will also be included in the analysis.

The permit holder will consult with Alaska Fishery Science Center personnel on methods used to make inferences about catch rate and relative crab density and abundance differences. Methods for any statistical analysis will also be developed in consultation with AFSC. Data on sex and size of crab by species will be put into tables as well as presented in charts using standard GIS program formats. The permit holder will incorporate in the final report any information that NMFS generates from the temperature and ecosystem data according to NMFS' direction.

The feasibility assessment for the final report will be based on informal interviews with EFP captains, member company personnel responsible for managing operations, and members/representatives of the commercial crab fishery. The conclusions on feasibility will attempt to summarize the general consensus from the overall set of interviews.