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PROJECT OPERATIONAL PLAN FOR THE 1995 ST. MATTHEW IS. BLUE KING CRAB TAGGING SURVEY

by

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ALASKA DEPARTMENT FISH AND GAME
COMMERCIAL FISHERIES MANAGEMENT AND DEVELOPMENT DIVISION

PROJECT OPERATIONAL PLAN

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FOREWORD

The Alaska Department of Fish and Game (ADF&G) has investigated the possible applications of PIT tags to mark-recapture studies of mature male red king crabs *Paralithodes camtschaticus* in the Bristol Bay fishery (Pengilly and Watson 1992, Watson et al. 1991). The objectives of the PIT tag program have been reviewed by Watson and Pengilly (1993a), with the primary objective of estimating the rates at which legal red king crabs are harvested by the commercial fishery. Secondary objectives are to estimate the annual survivorship rate of mature male crabs, the recruitment rate of pre-recruit crabs into the subsequent year's fishery, and the rate at which legal crabs carry over into the following year's fishery.

This project is funded under the State of Alaska Bering Sea crab test fishery program, now in it's sixth year. The proposed 1995 tagging survey for St. Matthew blue king crab marks the department's first survey effort in this relatively small, high-value Bering Sea king crab fishery and is one of two surveys planned under the test fishery program in 1995. Operational plans for Bristol Bay studies to-date are in Watson and Pengilly (1993b, 1992, 1993a, and 1994). The operational plan for the 1995 Bristol Bay red king crab survey and cost recovery charter are detailed in Watson et al. (1995).

The St. Matthew blue king crab project has two components; 1) a 21-d charter to conduct a tagging survey using internal, Passive Integrated Transponder (PIT) and external (Floy) tags in St. Matthew blue king crabs, and 2) recovery of internally and externally tagged blue king crabs from the 1995 St. Matthew blue king crab fishery. The total budget for the FY96 Bering Sea crab test fishery program is $454,600 (Appendix A).

INTRODUCTION

A pilot PIT tag study was implemented in 1990 to test the recoverability of PIT-tagged legal male red king crabs from Bristol Bay commercial fishery deliveries. Recovery of PIT tagged crabs was attempted using samplers placed at ten crab processing facilities with hand-held PIT tag detectors; inadequate equipment resulted in questionable tag recovery data (Watson et al. 1991). In 1991 automated PIT tag detection equipment was constructed and tested so that the reliability of tag returns could be estimated with a high degree of precision (Pengilly and Watson 1992). In 1992 and 1993, laboratory experiments were conducted to assess the effects of PIT tags on the short-term survivability of mature male red king crabs and to monitor PIT tag retention rates (Watson and Pengilly 1993a and 1993b). Preliminary results from the 18-month study indicate that survivability is not reduced in PIT-tagged crabs and that crabs retain functional PIT tags for at least 6 months. Post-study x-ray analysis shows that PIT tags remain within the tagging segment, i.e., PIT tags do not migrate from the implantation site.

All necessary preliminary work has been completed in preparation for an *in situ*, PIT tag mark-recapture effort. However, due to the closure of the Bristol Bay commercial fishery in 1994, plans for a small-scale tagging survey utilizing PIT tags and subsequent tag recovery program were dropped from the 1994 Bristol Bay test fishery program. In order to continue assessing the feasibility of implementing a full-scale PIT tag program in Bering Sea king crab stocks, the St. Matthew Is. blue king crab stock has been selected as the focus of studies for 1995. Selection of the St. Matthew blue king crab stock for the study is based on a combination of factors:

1. *Tagging Considerations.* Preliminary tests on sub-legal sized blue king crabs indicates that the current PIT tag will fit within the tagging segment of crabs as small as 112 mm carapace length.

2. *Tag Recovery Considerations.* It is likely that a commercial fishery in 1995 will occur, based on historic management practices and current estimated population levels. Additionally, the fishery is compressed in terms of geographic area, season length, and to some extent, processor location, which greatly facilitates the collection of tags and recapture information.

A large-scale tagging study will be implemented during the 1995 St. Matthew Is. blue king crab survey and recoveries of tagged crabs will be monitored in the subsequent September 1995 commercial fishery. We will compare returns of internally-marked (PIT-tagged) crabs versus externally-marked (Floy-tagged) crabs from shore-based and at-sea deliveries of blue king crabs to estimate a minimum exploitation rate from the fishery. Mature female blue king crabs will also be tagged to determine distribution, growth and reproductive condition in successive years and to assess bycatch of females in the directed blue king crab fishery.

OBJECTIVES

Prioritized objectives of the 1995 St. Matthew blue king crab survey and tag recovery programs are listed below.

I. Determine the 1995 commercial harvest rate of legal St. Matthew blue king crabs relative to their preseason distribution. This objective has 3 necessary components:

   a. Determine preseason geographic distribution of legal crab relative abundance as indicated by catch per unit effort in an August 1995 standardized pot survey.

   b. Determine relative harvest rates of legal crabs, as indicated by Floy tag recovery rates during the fishery, as function of preseason distribution.

   c. Estimate tag recovery efficiency of Floy tags relative to PIT tags from 1995 St. Matthew blue king crab commercial catch deliveries to a processing plant fitted with automated PIT tag detector.

II. Determine preseason geographic distribution of blue king crab by sex, size, and shell age class in the August 1995 pot survey relative to:

   a. their distribution in the July-August 1995 National Marine Fisheries Service (NMFS) trawl survey;

   b. their distribution in the September 1995 St. Matthew blue king crab commercial fishery pots sampled by observers;

   c. the distribution of NMFS trawl survey coverage for St. Matthew blue king crab; and,

   d. the geographic distribution of fishery effort and observer pot sample locations during the 1995 St. Matthew blue king crab commercial fishery.

III. Characterize the reproductive condition of females collected in the August pot survey relative to that of:

   a. those collected in July-August NMFS trawl survey; and,

   b. those collected by observers during the mid-September commercial St. Matthew blue king crab commercial fishery.

IV. Tag and release mature female blue king crabs to provide the opportunity for estimating recapture rates of mature female blue king crabs as bycatch in the 1995 St. Matthew blue king crab commercial fishery.

V. Tag and release mature female blue king crabs to provide the opportunity for estimating interannual growth-per-molt and probability of molt for mature St. Matthew blue king crabs

and for observing interannual changes in reproductive condition of mature female blue king crabs.

Additionally, the survey vessel will collect crabs from the Pribilof and St. Matthew Islands areas for the purpose of observer training upon the vessel's return to Dutch Harbor following the completion of the St. Matthew blue king crab survey.

TAGGING SURVEY

The study will be conducted aboard the test fishery charter vessel, FV *Notorious* from August 1-21, 1995. The study area will be generally located where legal male blue king crabs are concentrated in commercial quantities and in areas that are inaccessible to trawling (Figure 1). Four ADF&G biologists will be aboard the chartered vessel to conduct biological sampling and tagging.

During the 21 day charter, the vessel will be collecting crabs for an observer practicum to be held in Dutch Harbor near the end of August and conducting the blue crab work detailed below. The vessel will travel to the Pribilof Islands first, dropping off approximately 10 pots in an effort to pick up red king crab, *C. opilio* and Korean hair crabs. The 10 pots will be left soaking at the Pribilof Islands and retrieved when the vessel returns to Dutch at the end of the charter. Locations of these pots will be documented on the Pilot House Log (Appendix D.1). A suggested itinerary for the survey vessel is shown below.

Date	Itinerary
8/1	Depart Dutch Harbor-travel to Pribilof Is.
8/2	Travel to Pribilof Is./set pots for observer crabs
8/3	Travel to St. Matthew/set gear as instructed.
8/20	Pull last of St. Matthew survey gear; travel to Pribilofs; pull observer practicum pots; travel to Dutch Harbor.
8/22	Arrive Dutch Harbor; deliver observer crabs to East Point and offload survey gear.

Survey Design

The 1995 St. Matthew survey area and station array were determined from geographic distribution of historic blue king crab fishery effort, geographic distribution and density of blue king crab in historic NMFS trawl surveys, and the time constraints of a 21 day survey charter. Approximately 90% of the pot lifts from the 1990-1994 commercial fisheries were pulled from statistical catch areas 726001 and 736001 (Appendix B.1). Production from these two areas also accounted for nearly 90% of the commercial harvest during the same period (Appendix B.2). Catches of male and female blue king crabs from annual NMFS survey trawls conducted between 1990 and 1994 and within the proposed 1995 ADF&G survey area are variable. However, large concentrations of blue king crabs have been documented in survey catches (Appendices B.3 and B.4).

Location of pots sampled by observers in the 1990 - 1994 commercial fisheries was assessed in light of tag recovery objectives, with particular regard to the veracity of these samples. Almost all of the sampled observer pots are within the proposed 1995 survey area (Appendices B.5 and B.6). Sex, size and shell age distributions from these samples are fairly broad, with the exception of juvenile crabs less than 60 mm carapace length (CL)(Appendices B.7 and B.8).

Station Grid and Strata

The survey grid consists of 143 core stations arrayed in two strata, with two optional stations to be sampled if time permits and is located southwest of St. Matthew Island between 59°30' and 60°30' N latitude and from 172° to 174° W longitude (Appendix C.1). The two strata differ only in terms of station density, with stratum 2 being 1.5 times that of stratum 1. However, tagging goals and procedures differ between the two strata.

The station layout is based on a grid of 127 stations spaced by 5-min latitude (5 nm) north-to-south and by 10-min longitude (approximately 5 nm) east-to-west. The southern-most row of stations runs on the 59°32.50' N latitude line; the northern-most row of stations runs on the 60°27.50' N latitude line. The western-most column of stations runs on the 173°55.00' W longitude line; the eastern-most column of stations runs on the 172°5' W longitude line. An additional 5-min latitude by 10-min longitude grid of 18 stations is overlaid on the base grid within stratum 2. The grid for the additional 18 stations is offset from the base grid stations by 2.5-min latitude (2.5 nm) and 5.0-min longitude (2.5 nm).

Stations are assigned numerical designations, 1 through 145. Station 1 is the northwestern-most station; the remaining stations are numbered from west-to-east, north-to-south, so that the southeastern-most station is station 145 (Appendix C.2). Note that stations 22 and 23 are optional stations that will only be sampled if they do not interfere with the sampling goals for adjacent stations. Station, pot, and block locations, and strata designations are detailed in Appendices C.3 - C.6.

Array of Pots Within Stations

Each station consists of 4 pots spaced by 1/8 nm (0.125' latitude) and arrayed in a 3/8 nm north-to-south line. The location of the station as given in Table 1 is the center of the 3/8 nm line. Appendix C.4 provides the locations of individual pots within stations. If prevailing wind or sea conditions necessitate reorienting pots within a station, the 1/8 nm pot spacing and centering of the 4-pot string on the station location will be maintained.

Target Soak Times for Survey Pots

The target soak time range for each survey pot is 30 to 36 hr. Some departures from the 30-36 hr target may be necessary, but soak times less than 24 hr or greater than 42 hr will be considered unacceptable unless weather or other logistic constraints make them unavoidable. Given the time of day that the vessel first arrives in the survey area, the soak times of the first stations picked in the survey might necessarily be on the low end of acceptable; however, soak times in the 30-36 hr range for the stations picked on subsequent days.

Survey Coverage Goal

The survey coverage goal is to sample all 143 core stations (i.e., all but Stations 22 and 23; Appendix C.2), while maintaining the target pot soak time and attaining the pot sampling and tagging goals for each strata. Seventeen of the 21 days are allotted for setting 36 pots (9 stations) and sampling and tagging from an additional 36 pots (9 stations) on most days. The remaining four days will be spent in travel to and from Dutch Harbor.

If all goes well and as expected, the survey coverage goal should be attainable. The following section gives a 17-day survey itinerary toward the coverage goal. Guidance on contingency plans for reducing survey coverage when necessary are given in a separate section, CONTINGENCY PLANS, also below.

Station Blocks and Survey Itinerary

To identify groups of stations to drop when time constraints demand and to help in guiding a survey itinerary to meet the coverage goal, the 143 core survey stations have been grouped into 16 blocks of stations numbered from 1 to 16 (Appendices C.5 and C.6). Note that some of the blocks include stations in both stratum 1 and stratum 2 (block 2, for example). The grouping of stations by blocks should not be confused with the defined strata. All but four the 16 blocks consist of 9 stations; two of the blocks consist of 10 stations, one consists of 8 stations, and one consists of 7 stations. The two blocks of 10 stations (blocks 5 and 7) are entirely within stratum 2, where vessel running time between stations is reduced due to the higher density of stations; however, that reduction in running time may be offset by the increased tagging goals within stratum 2 (see POT SAMPLING AND TAGGING). Blocks 5 and 7 are subdivided into sub-blocks 5a and 5b, and 7a and 7b, respectively (Appendix C.5 and C.6). Subdivision of those blocks is to aid in contingency planning (see CONTINGENCY PLANS).

The station blocks are identified to assist in setting a daily itinerary that should allow completion of the survey coverage goal unless time is lost to weather or other factors. Appendix C.7 provides the proposed daily itinerary for setting and picking blocks of stations, starting with setting the block 1 stations on the first morning after arriving at the survey area. Station priorities are incorporated into the itinerary in Appendix C.7. All stratum 2 station pots will be picked by the end of the ninth day after arriving on the survey grounds; blocks 1-12 will be picked by the end of the thirteenth day after arriving on the survey grounds; with the remaining lower priority blocks picked last in order of decreasing priority. The station blocking and itinerary was also designed to:

1) minimize travel between picking and setting stations, particularly when working in stratum 2; and,

2) allow for adopting contingency plans for reduced daily coverage in stratum 2 if the stratum 2 tagging goals are too time consuming.

Survey coverage goals, station blocks and the itinerary will be discussed with the skipper prior to reaching the survey area to determine an optimal order of setting and picking stations within blocks. Within blocks, the setting and picking of individual stations will be ordered so as to

minimize the distance traveled between the last station set in the evening and the first station picked in the morning. Regardless of the itinerary for individual stations within blocks that is used, stations will be picked in the order set to insure some consistency of pot soak times. Pots within stations do not have to picked in the same order that they were set, however.

The survey itinerary assumes that all pots within a single block of stations can be set within six hours and that the sampling and tagging goals for all pots within a block of stations can be completed in 12 hrs. Those assumptions are based on experience from the 1994 Bering Sea Crab Test Fishery survey of Bristol Bay red king crabs. In that survey, stations and pots were arrayed identical to this year's St. Matthew stratum 1 stations and grouped into 18 blocks of 9 stations each. The average time to set 36 pots within blocks of 9 stations was 5 hr 47 min (minimum = 5 hr 7 min, maximum = 7 hr 15 min). The average time to pick and sample from 36 pots within blocks of 9 stations was 8 hr 35 min (minimum = 6 hr 55 min, maximum = 10 hr 47 min). No crabs were tagged during the 1994 survey, however 1,897 crabs were sampled and measured from 36 pots (average = 53 crabs per pot) within 10 hrs on one day. Tagging will increase the time necessary for picking survey pots; periods in excess of 12 hr to pick all the pots in a block may be encountered. In the 1993 Bristol Bay Bering Sea Test Fish survey, 30 legal red king crabs per pot were Floy tagged and released within 16 to 25 minutes of coming on deck (average = 19 minutes, n=97 pots) on days when 500-720 legal crabs were tagged.

Catch Sampling

All crabs will be handled gently during sorting, measuring and tagging. All crabs will be released by placing (not dropping) each crab in the water trough, with the abdomen (ventral side) down while the vessel is at a complete stop on the location where the pot was lifted (or, if necessary, just making enough headway to stay out of the trough during rough seas). Crabs will be released immediately following sampling and/or tagging into the water trough.

The contents of each pot at each station will be fully enumerated to provide catch per unit effort (CPUE), and size, sex, and species composition data. In addition, the number of legal-sized male blue king crabs will be documented for each pot in every station. The Pilot House Log will be completed for each survey pot and all observer crab collection pots (Appendix D.1).

Blue King Crab

The contents of each pot will be sorted by species and sex. Tagging of legal male crabs will be completed first in order to decrease the deck time for these crabs prior to their release. All of the remaining blue king crabs will be measured. Measurements and catch data for males is recorded on the Male Blue King Crab Form (Appendix D.2); for females, data is recorded on the Female Blue King Crab Form (Appendix D.3). Measurements of untagged blue king crabs from a pot can be recorded on the same form as the tagged crabs from that pot.

Other Crab Species

Incidental catch of crab species (other than *C. opilio*) should be minimal and all incidental crabs will be sampled. *C. opilio* can be subsampled in order to save time; crabs will be sorted by sex

prior to subsampling. Measurements of all crabs other than blue king crabs are recorded on the Crab Research Data Form (Appendix D.4).

Tagging Strategy

Tagging of blue king crabs will begin after sorting the pot contents. There are 8,850 series A Floy tags (A4176-A13000) and 5,000 PIT tags for use in the survey. Tagging goals for each station are different in each survey strata. Of the male blue king crabs, only legal males will be tagged. A legal male will be tagged with either a Floy tag or a PIT tag; there will be no dual-tagging of crabs. Floy tagging of males will occur in both strata, but PIT tagging will only occur in stratum 2. Females will be tagged only in Stratum 2 using Floy tags. A summary of tagging strategy by station, sex and tag type is given in Appendix C.8.

Stratum 1

In stratum 1, only legal male blue king crabs will be tagged and only Floy tags will be used. The goal is to Floy-tag at least 2,000 legal males in stratum 1; 4,000 Floy tags are allotted for use in stratum 1. In stratum 1, up to 40 legal males per station will be Floy-tagged. For example, if 40 legal males are tagged in the first pot of a station, no more tagging is required for that station.

See CONTINGENCY PLANS for when and how the cap of 40 tagged legal crabs per station is adjusted downward. Given time and the number of Floy tags remaining out of the allotted 4,000, the option of tagging more than 40 crabs per station, if necessary, to reach the goal of 2,000 Floy-tagged legal crabs in stratum 1 is available.

If legal males from a pot must be subsampled in order to remain below the 40 legal crabs per station cap, subsample in a manner that assures a representative size-shell age distribution of the legal crabs in the pot.

Stratum 2

Legal male and mature female blue king crabs will be tagged in stratum 2. Tagging goals for stratum 2 are:

1. 1,350 legal males with Floy tags;
2. 1,350 legal males with PIT tags; and,
3. 900 females with Floy tags.

Legal males will be tagged with Floy tags and PIT tags in equal numbers at each pot. There are 3,000 Floy tags and 5,000 PIT tags for legal males and 1,850 Floy tags for females allotted for use in stratum 2.

Legal males. At each pot, the number of legal males will be equally divided; size and shell-age distribution should be comparable in the two halves. Half of these crabs will be tagged with Floy tags and half will be tagged with PIT tags, up to a cap of 60 legal crabs of each tag type per station. For example, if 60 legal males are Floy-tagged and 60 legal males are PIT-tagged from

the first pot in a station, no additional tagging will be needed at that station. If there is an odd number of legal males, the tag type that the odd leftover receives will be determined randomly. If two tag crews can work simultaneously, one crew will Floy-tag and the other crew will PIT-tag.

See CONTINGENCY PLANS for when and how the cap of 60 legal crabs per tag type is adjusted downward. Given time and the number of Floy tags remaining of the allotted 3,000, the option of tagging more than 60 crabs per tag type per station, if necessary, to reach the goal of 1,350 legal crabs tagged with each tag type in stratum 2 is available. If legal males from a pot must be subsampled to reach the station cap of 60 legal crabs per tag type per station, it will be done in a manner that assures a representative size-shell age distribution of the legal crabs in the pot.

All PIT-tagged crabs will be scanned with a hand-held reader prior to release in order to verify that the PIT tag ID has been captured and stored on the reader. At the end of every day, tag numbers in the hand-held reader will be downloaded to the computer and backed up on a labeled diskette. Protocols for electronically recording and storing PIT tag data are described in Appendix E.

Females. Mature females will be tagged only in stratum 2 and only with Floy tags. Females greater than 80 mm CL will be tagged. However, if an 80 mm CL crab is physically too small to tag without injuring the crab, an appropriate minimum size that can be tagged will be determined and implemented for the remainder of the survey.

In stratum 2, up to 25 females per station will be tagged. For example, if 25 females out of the first pot for a station have been tagged, no more tagging is required for that station.

See CONTINGENCY PLANS for when the 25 females per station can be adjusted downward. Given time and the number of Floy tags remaining out of the allotted 1,850, the option of tagging more than 25 females per station in order to reach the goal of 900 Floy-tagged females in stratum 2 is available. If mature females are caught in stratum 1 and the female tagging goal for stratum 2 cannot be reached, the option of Floy-tagging mature females in stratum 1 will also be available.

The need for subsampling a pot for tagging females may be more likely than for the legal males. If females must be subsampled from a pot to keep under the cap of 25 females per station, subsample in a manner that assures a representative size-shell age distribution.

Tagging Procedures

Crabs that are injured, e.g., cracked carapaces, torn leg segments, or any other major, new injuries will not be tagged. However, crabs with old injuries (regenerated legs, black caps, etc.) will be tagged.

Floy-Tagged Crabs

Legal male blue king crabs and female blue king crabs will be tagged through the isthmus muscle as described by Gray (1965) using yellow Floy model FT-4 spaghetti tags. Correct placement of the Floy tag is shown in Figure 2. Floy tag numbers, along with biological data for each tagged crab will be recorded on the Male Blue King Crab Data Form (Appendix D.2) or the Female Blue King Crab Data Form (Appendix D.3)

PIT-Tagged Crabs

Legal male blue king crabs from stratum 2 will be tagged using PIT tags. Crabs will be injected in the proximal segment of the right, fifth walking leg with Trovan model ID 100 12-mm PIT tags as described by Donaldson et al. (1992). Following successful injection, each PIT-tagged crab will be scanned with a Trovan Model PIT tag detector. A unique, 10-digit number will appear in the LCD screen on the detector and is simultaneously stored in the detector memory. The tagging file(s) from the detector will be down loaded once per day to the computer. Beginning with the first PIT-tagged crab, the last four digits of the 10-digit PIT tag number will be recorded in the PIT Tag number column on the Male Blue King Crab Data Form every fifth crab (Appendix D.2).

Keeping track of the PIT tag data will probably be the hardest task as it involves tracking on-deck work with information stored or to be stored in the computer. The person who records the data on deck must pay particular attention to detail as (s)he will be verifying information as it is recorded.

Instructions for recording and storing tag data, and protocols for the hand-held reader and computer interface are detailed in Appendix E.

Contingency Plans

The primary objective of this study is to determine an index of the commercial harvest rate relative to the preseason distribution of legal male blue king crabs from the 1995 St. Matthew fishery. In order to calculate this index, the survey must cover a sufficient area, soak times must be consistent within the surveyed area, and a sufficient number of legal crabs must be tagged throughout the survey area. The survey design and goals were developed to meet those ends; however, situations that can interfere with meeting the survey and tagging goals are anticipated. Contingency plans for delays will have to balance the competing goals of area coverage, soak time, and tagging. This section presents guidelines for contingency plans when delays due to weather or excessive tagging demands occur, and are followed by specific contingency plans for adapting the itinerary within stratum 2.

There are two sources of problems that could interfere with survey completion and the maintenance of soak times: 1) Situations beyond the control (e.g., weather) and, 2) controllable items such as the number of crabs tagged at a station or a combination of both. Adjustments to the survey goals are made within the contingency plans as follows: 1) reduce tagging caps per

station to maintain schedule for coverage and soak time, while still maintaining overall tagging goals, and 2) reduce the area of coverage, while maintaining soak time goals and tagging goals.

Priority Ranking of Stations

If the schedule is compromised, it will not be possible to complete all 143 stations. Stations are grouped into priority coverage classes in this section. Selection of stations within those priority groups are left to the survey crew leader. There is no station-by-station priority list within classes of stations; beyond what is given here, further prioritization of stations would be arbitrary and decisions would be best based on evaluating the situation as it arises.

Sampling and tagging blue king crabs from stations 1 - 21 and 24 - 109 (the 107 core stations in blocks 1 -12 that are north of 59°45' N latitude) are essential to meeting the survey objectives. These stations must be covered during the survey to minimally meet the survey objectives. Unless prolonged, extreme weather conditions are encountered, these 107 core stations should be covered during the 21 day vessel charter.

If weather or other factors necessitates reducing the coverage from the full goal of 143 stations, stations will be omitted according to the station priority rankings as ordered in Appendix C.9. If time constraints necessitate dropping non-essential stations from the survey, stations designated as Priority 4 in Appendix C.9 will be the first stations omitted; stations designated as Priority 1 in Appendix C.9 will be the last stations omitted.

The survey itinerary can be adjusted to prevailing conditions, however, the station priority rankings in Appendix C.9 set constraints on the survey itinerary that cannot be deviated from. All essential, blocks 1-12 stations must be covered before block 13 stations; block 13 stations must be covered before block 14 stations; block 14 stations must be covered before block 15 stations; and, block 15 stations must be covered before block 16 stations.

Delays in Picking and Setting Scheduled Stations

If stations are set that exceed target soak time goals due to weather, no more stations will be set until the target soak time goals can be met. If scheduled picking of stations is delayed due to weather, no more stations will be set unless tagging and sampling is completed from pots that are already soaking.

Weather Delays. If extreme conditions are encountered such that the 107 essential stations cannot be covered, some of the survey objectives cannot be achieved. If it becomes clear that the 107, blocks 1-12 essential stations cannot be covered within the vessel charter time limit, all 45 of the stations in stratum 2 (Appendix C.2) will be completed. If the 45 stations in stratum 2 cannot be surveyed within the 21 day survey due to extreme conditions, alternative plans will be determined as the situation arises.

If all the pots scheduled to be picked for the day cannot be picked due to weather, soak time goals will likely be exceeded for those pots. As with any other delay, do not set any additional pots until the target soak time can be achieved.

Delays due to High Catch and Per-Station Tagging Caps. With four people in the crew, measuring crabs should not cause delays in the itinerary. However, tagging of crabs, particularly in stratum 2, could constrain the scheduled itinerary if consistently large catches of crabs occurs throughout the day. Guidelines for reducing per-station tagging effort will be made on an as-needed basis each day. If tagging effort must be reduced on any day, return to the original procedures and tagging caps on the beginning of the next day.

Stratum 1. Tagging goals for stratum 1 should be feasible as reduced catches of females and reduced tagging per station effort are expected within this portion of the survey area. However, if the cap of 40 legal crabs per station impedes the schedule, tagging will be reduced to 30 legal crabs per station until the schedule is on track.

Stratum 2. Tagging effort in stratum 2 will be reduced on a per station basis if sampling is delayed as ordered below:

1. Females will not be tagged until the scheduled picks are completed for that day.

2. The cap of 60 legal crabs per tag type per station will be reduced to 30 per tag type per station until the day's scheduled picks are completed. If the reduction to 30 is still too high, the cap will be reduced to 20 until the day's scheduled picks are completed.

In the event that the tagging cap for legal crabs is reduced, the overall legal tagging goal for stratum 2 will still be achieved. At 30 per tag type per station, sufficient numbers of legal crabs per station will be tagged. If female tagging is dropped for several stations in a day, the female tagging goal will likely be met in stations later in the survey; if not, only the lower priority goal (tagging females) will be sacrificed.

Reduced Daily Coverage in Stratum 2

Coverage of stratum 2 stations can be reduced on a daily basis as prioritized below:

1. Heavy tagging demands in block 3. If time constraints in block 3 are too great, stations in block 5a will be set on the next day and in block 5b on the day after that. Tagging effort will not be reduced in blocks 5a and 5b when picking those stations unless it is impractical to complete them. One day will be lost before setting block 6 stations; only setting and picking of a lower priority block will be sacrificed.

2. Heavy tagging demands in blocks 5a and 5b. If time constraints in block 5 force a reduction in tagging efforts, or if catch and tagging effort is high in 5b, only block 7a will be set the next day and only block 7b will be set the day after that. Tagging effort will not be reduced in blocks 7a and 7b when picking those stations unless it is impractical to complete them. One day will be lost before setting the block 8 stations; only setting and picking of a lower priority block will be sacrificed.

Observer Practicum Crab Collection

The ADF&G shellfish observer program staff has requested that a small number of live crabs be collected during the charter for observer candidate testing. Male and female blue king crabs, as well as *C. opilio* crabs will be retained during the tagging survey. Red king crab, *C. bairdi* and Korean hair crabs will be collected from approximately 10-15 pots set in the Pribilof Is. area when the vessel is enroute to survey grounds. The pots will be set in locations determined by the ADF&G crew and the vessel captain in known areas of red king crab and Korean hair crab concentrations.

The following numbers of each species and sex should be collected and brought to Dutch Harbor:

Blue king crabs:

> 10 males (combination of legal and sub-legal; new and old shells; 5 females (combination of egg-bearing and barren; new and old shell).

Red king crabs:

> 10 males (combination of legal and sub-legal; new and old shells; 5 females (combination of egg-bearing and barren; new and old shell).

Korean hair crabs:

> 10 males (combination of legal and sub-legal; new and old shells; 5 females (combination of egg-bearing and barren; new and old shell).

C. opilio:

> 200 males (combination of legal and sub-legal; new and old shells; 25 females (combination of egg-bearing and barren; new and old shell.

C. bairdi:

> 25 males (combination of legal and sub-legal; new and old shells; 10 females (combination of egg-bearing and barren; new and old shell.

Tanner crab hybrids:

> 25 males (combination of legal and sub-legal; new and old shells; 10 females (combination of egg-bearing and barren; new and old shell.

Crabs with parasites, shell rust (chitinoclastic bacterial infection), black mat syndrome, and cottage cheese disease are desirable. Collected specimens will be documented on the Observer Practicum Crab Collection Record (Appendix D.6). Crabs will be delivered to East Point Seafoods in Dutch Harbor; observer program staff will offload them if necessary.

TAG RECOVERY

Floy-Tagged Crabs

An intensive tag recovery program involving dock-side samplers and mandatory at-sea shellfish observers for the return of Floy-tagged, legal blue king crabs during the 1995 St. Matthew blue king crab fishery will be conducted. Prior to the fishery and during vessel tank inspections, tag samplers will contact vessel crews and processing facilities to explain the tag recovery effort and attendant tag reward program. A news release was issued to the Bering Sea crab industry outlining the tag recovery effort (Appendix H.1). Tag samplers will be stationed in Dutch Harbor, Akutan, King Cove, Kodiak, and St. Paul, utilizing both tag program personnel and shellfish dockside samplers. At-sea shellfish observers will also monitor catches for tagged crabs. All recovered tagged crabs will be measured and assessed for shell age, with complete capture location data to be obtained from vessel captains as described by Watson and Pengilly (1992a). Instructions for dockside samplers and shellfish observers are detailed in Appendix H.2 and H.3, respectively.

PIT-Tagged Crabs

An automated PIT tag detection system will be installed on the primary crab processing line at Westward Seafoods in Dutch Harbor prior to the start of vessel deliveries from the 1995 St. Matthew blue king crab commercial fishery. Reinstallation of the existing Westward system (originally installed in 1991) will be accomplished as in Pengilly and Watson (1994). The Crab Electronic Identification System (CEIS) will undergo rigorous testing prior to processing to ensure proper operating function and tag detection reliability standards are met. Detailed instructions for the operation of the CEIS are in Pengilly and Watson (1992).

Automated PIT tag monitoring will occur on a 24 hr basis until processing is completed for the season. Each tag recovery is electronically stored along with the date and time of recovery; all data will be uploaded to a portable computer daily. System installation and maintenance will be provided by an engineer from Infopet Identification Systems (Burnsville, MN). Both systems will be attended on a 24 hr basis by ADF&G personnel to reduce accidental damage to the units and to alert the engineer to any problems associated with the continuous operation of the units.

Individual vessel deliveries will be monitored for PIT recoveries to afford comparison with Floy recoveries from the same vessels. Analysis of PIT tag recoveries will be done after the season is closed; there will be no in-season use of these data.

SCHEDULES

7/94-6/95	Project planning (Watson, Pengilly)
5/95-7/95	Survey preparations (Blau, Byersdorfer, Tracy)
8/1-21/95	Tagging survey (Blau, Morrison, Phillips, Schwenzfeier)

9/10-25/95	PIT and Floy tag recovery (Pengilly, Tracy, Byersdorfer, Phillips)
9/95-11/95	Survey and tag recovery data editing and entry (Watson, Byersdorfer, Blau)
11/95-3/96	Data analysis and report writing (Vining, Blau, Tracy)
1/96	Tag rewards issued (Tracy, Byersdorfer)

REPORTS

1. A summary of biological data collected during the 1995 St. Matthew Is. blue king crab tagging survey. Reg. Inf. Rep. Blau et al. December 1995.

2. An analysis of visible (Floy) and internal (Passive Integrated Transponder) tag returns from the 1995 St. Matthew blue king crab commercial fishery. Reg. Inf. Rep. Tracy et al. March 1996.

LITERATURE CITED

Donaldson, W.E., D. Schmidt, L. Watson, and D. Pengilly. 1992. Development of a technique to tag adult red king crab, Paralithodes camtschaticus (Tilesius, 1815), with passive integrated transponder tags. J. Shellf. Res. 11(1):91-94.

Gray, G. W., Jr. 1965. Tags for marking red king crabs. Progr. Fish-Cult. 27:221-227.

Pengilly, D., and L.J. Watson. 1992. Visible (Floy) and non-visible (PIT) tag retention experiments and automated PIT tag detection trials conducted on Bristol Bay red king crab in 1991. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K92-28, Kodiak.

Watson, L.J., and D. Pengilly. 1992. Project operational plan for the 1991 Bristol Bay red king crab test fishery project. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K92-31, Kodiak.

Watson, L.J., and D. Pengilly. 1993a. Project operational plan for the 1992 Bristol Bay red king crab test fishery project. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K93-5, Kodiak.

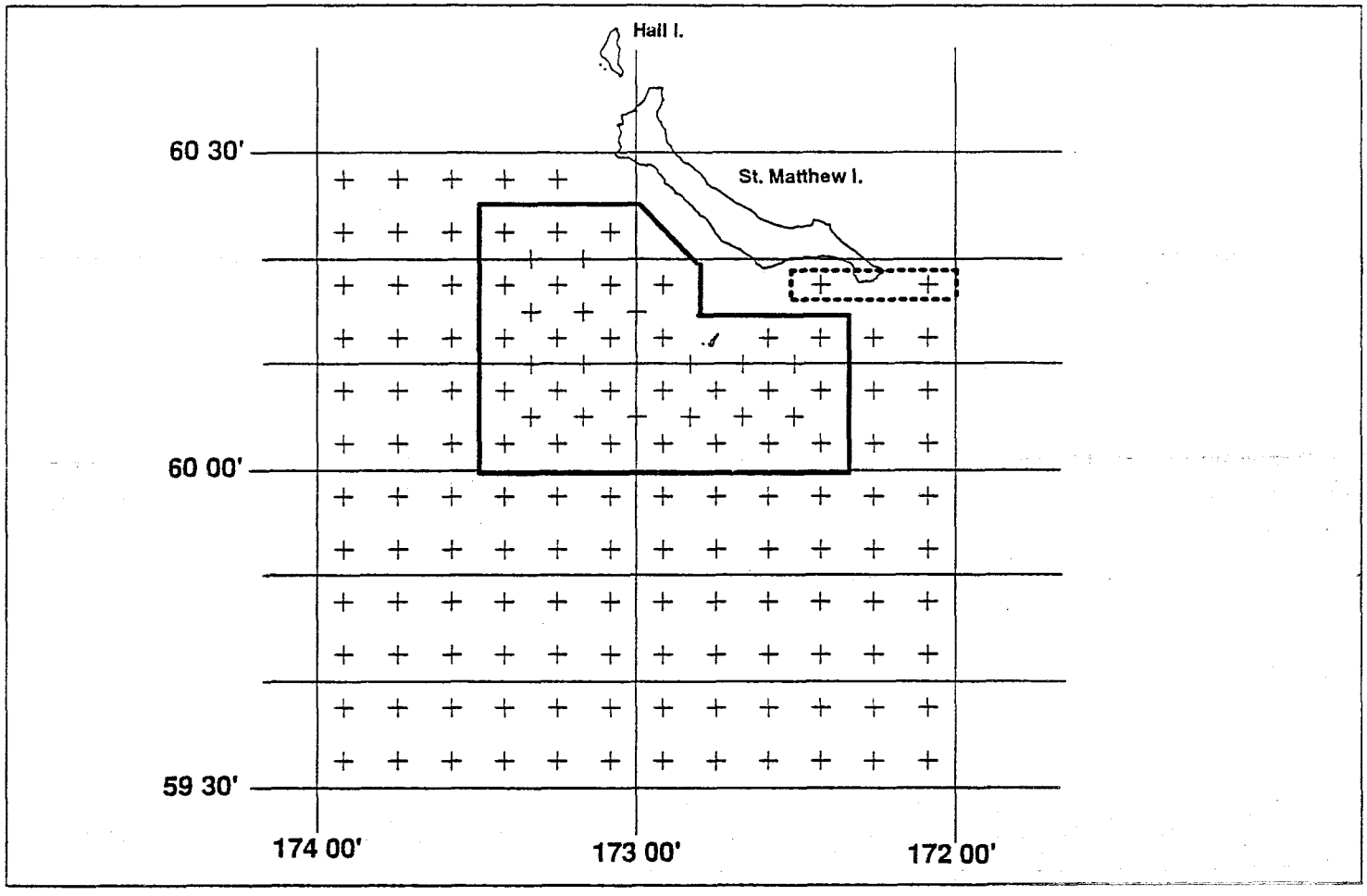
Watson, L.J., and D. Pengilly. 1993b. Project operational plan for the 1990 Bristol Bay red king crab test fishery project. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K93-17, Kodiak.

Watson, L.J., and D. Pengilly. 1994. Project operational plan for the 1993 Bristol Bay red king crab test fishery project. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K94-27, Kodiak.

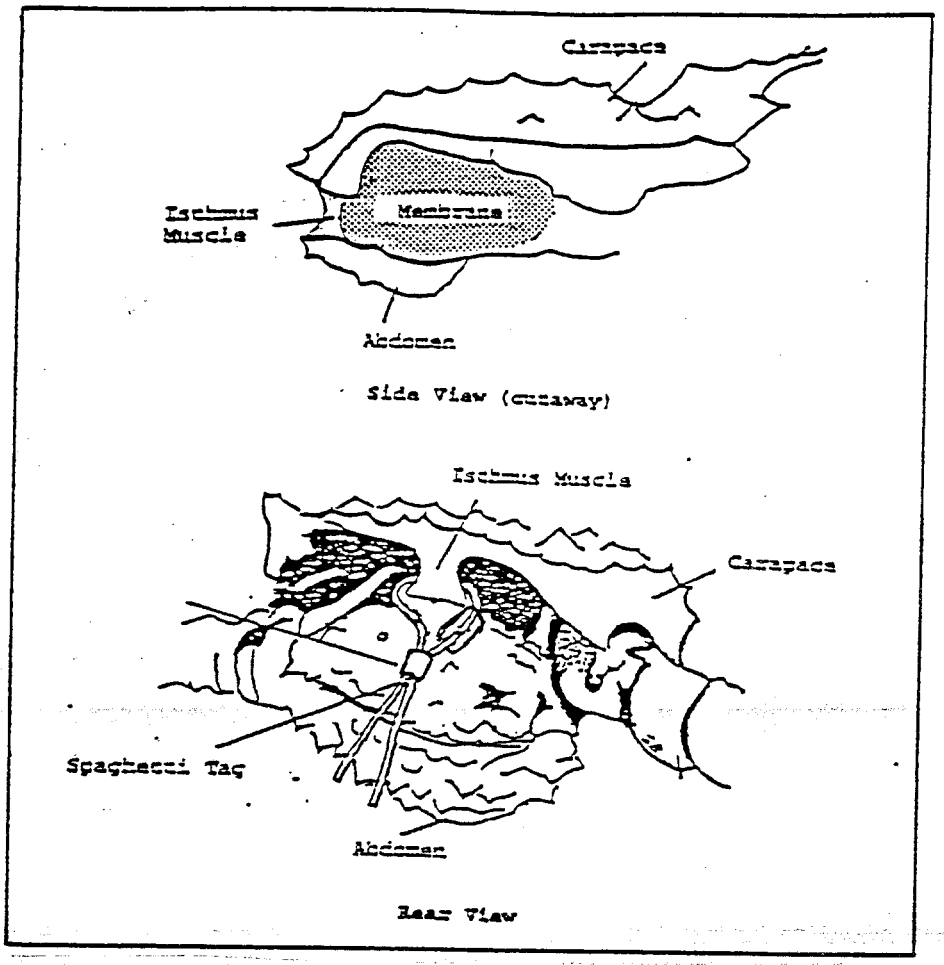
Watson, L.J., D. Tracy, and D. Pengilly. 1995. Project operational plan for the 1995 Bristol Bay red king crab test fishery project. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K95-xx, Kodiak.

Watson, L.J., D. Pengilly, W.E. Donaldson, and D. Schmidt. 1991. A pilot mark recapture study using external tags and implantable Passive Integrated Transponder (PIT) tags on red king crab in Bristol Bay, Alaska. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K91-21, Kodiak.

Figure 1. Location of the 1995 St. Matthew blue king crab tagging study.



2(a)



2(b)

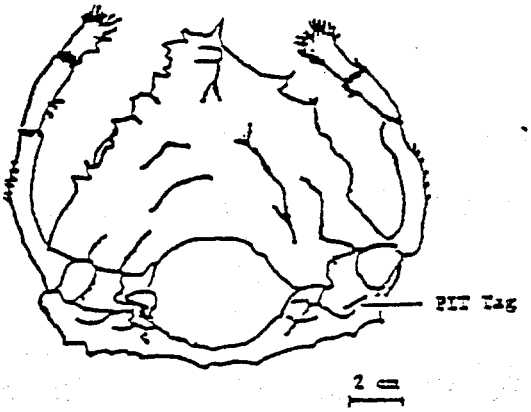


Figure 2. Floy tag placement (a) and PIT tag injection site (b) for king crabs.

APPENDIX

APPENDIX A: FY96 YELLOWBOOK FOR THE BERING SEA CRAB TEST FISHERY PROJECT

Appendix A. FY96 Yellowbook for the Bering Sea Crab Test Fishery Project. Note that the Yellowbook allocation reflects the legislative approved project amount of 446.8k. Program receipts of 454.7k reflect the FY96 actual project cost.

PROJECT TITLE:	Bering Sea Crab Test Fishery	PROJECT NUMBER:	TF-785
FISHERY UNIT:	Bering Sea/Aleutians Crab	LEDGER:	1147785
COMPONENT:	400110100 - Fisheries Mngmt.	LOCATION:	Kodiak
PROG.ELEMENT:	Test Fish Survey	LEGISLATIVE DISTRICT:	27
FUNDING LEVEL:			

FISHERIES AFFECTED: Bering Sea/Aleutian Islands Crab
SPECIES AFFECTED: King and Tanner Crab

PROJECT DESCRIPTION:

Funding from this project will support the state's expenses for conducting shellfish tagging projects and genetics investigation in the Bering Sea. The Bristol Bay red king crab harvest was valued recently in excess of $50 million. Error in estimating natural mortality rates and population abundance can jointly provide major errors in development of Guideline Harvest Levels. Additional Bering Sea Tanner species and stock ID development research can be conducted.

PROJECT OBJECTIVES:

Bering sea crab populations are assessed to provide information for development of Guideline Harvest Levels. Data will be collected on all crab captured during the surveys. Long term tag recovery data should provide information on natural mortality rates to be used in estimating harvest rates designed to meet conservation and economic objectives established by the BOF.

BUDGET MANAGER: 11-1857 Donn Tracy TITLE: Fishery Biologist III

PRIOR YEAR ALLOCATIONS

Budget Detail	**FY93**	**FY94**	**FY95**	**FY96**
100 Personal Services	160.7	165.4	200.5	192.7
200 Travel	22.1	2.1	15.3	15.3
300 Contractual	223.2	223.2	222.8	222.8
400 Commodities	53.5	49.2	9.0	9.0
500 Equipment	0.0	0.0	7.0	7.0
Project Totals	459.5	459.9	454.6	46.8

Federal Receipts	0.0	0.0	0.0	0.0
General Fund	0.0	0.0	0.0	0.0
Interagency Receipts	0.0	0.0	0.0	0.0
Program Receipts	459.5	459.9	454.6	446.8
General Fund Match	0.0	0.0	0.0	0.0
Fish and Game Fund	0.0	0.0	0.0	0.0
CIP Funds	0.0	0.0	0.0	0.0
Staff months	26.0	29.0	30.0	30.0

PROJECT NUMBER: TF-785

PROJECT TITLE: Bering Sea Test Fishery

COMPONENT: 400110100 Fisheries Management

UNIT: Bering Sea Aleutians Crab

REGION: 4

LEDGER CODE: 11147785

PCN	TITLE	NAME	RS	S	LOC	PM	SWD	RDO	OT	HAZ	GY	SW	SB	TOTAL
11-1117	Fish Bio I	Byersdorfer Susan	14 F	FS	CAA	6.0	22	8	50	0	0	0	0	$37,849.5
11-1351	Fish Bio II	Tracy Donn	16 C	FS	BKB	5.0	22	8	0	0	0	0	0	$31,681.7
11-1390	Fish Bio II	Merkouris Susan	16K	FR	EBA	3.0	0	0	0	0	0	0	0	$15,848.0
11-1595	F&W Tech. III	Stewart Heathere	11 A	FS	CAA	1.0	15	6	50	0	0	0	0	$ 7,749.1
11-1825	F&W Tech. III	Phillips Kimberly	11 F	FS	CAA	1.0	0	0	50	0	0	0	0	$ 5,812.9
11-1843	F&W Tech. III	Rudge Kimberly	11 J	FS	CAA	1.0	0	0	50	0	0	0	0	$ 5,42.5.1
11-1857	Fish Bio III	Watson Leslie	18 J	FR	CAA	12.0	5	2	0	0	0	0	0	$77,402.0
11-1967	Fish Bio I	Hobart Kathy	14 C	FS	BKB	1.0	22	8	0	0	0	0	0	$10,850.4
TOTALS						30.0	86	32	200	0	0	0	0	$192,736.3

Line	Description	Amount	Comments
72240	Field travel	10.70	Travel
72500	PerDiem/Other costs	4.60	Per diem expenses
73000	Other services/charges	222.80	Frt. 7& postage, PIT TAG R&D, Photo & print
74480	Household/Institutional	1.00	Groceries
74520	Scientific supply	2.00	Misc. scientific equipment
74600	Other operation supplies	6.00	Tag rewards
75690	Mach/Equip summary	7.00	Misc. computer
TOTALS		254.10	

Grand Total $446,836.3

APPENDIX B: 1995 ST. MATTHEW BLUE KING CRAB TAGGING SURVEY DESIGN SUPPLEMENT

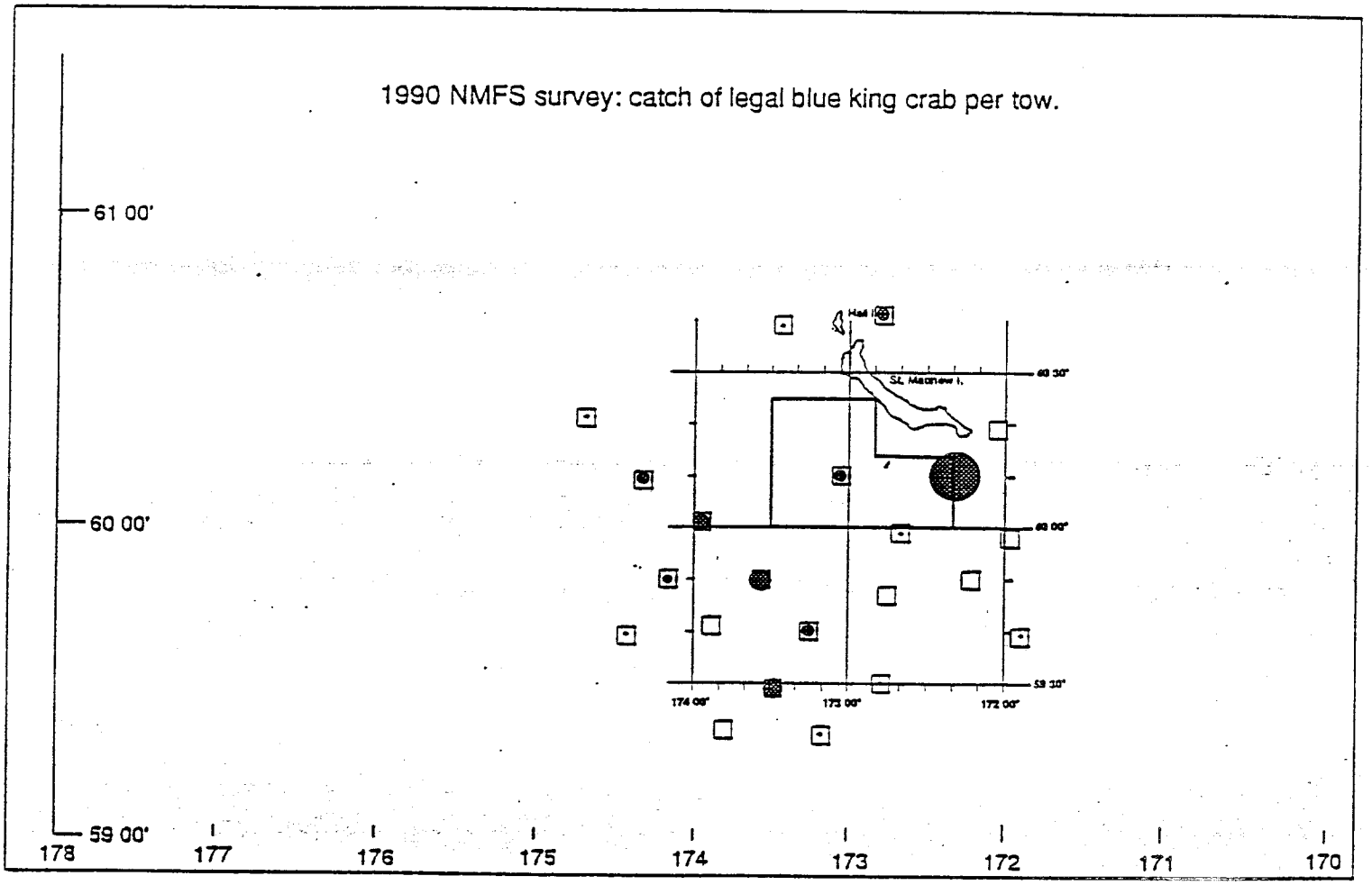
Appendix B.1. Number of pots lifted in Statistical Areas 726001 and 736001 relative to all other Statistical Areas in St. Matthew commercial fisheries, 1990-1994.

Fishery	% of Total 726001	% of Total 736001	% of Total Both
1990	32.17%	62.23%	94.41%
1991	40.13%	51.64%	91.77%
1992	57.13%	26.40%	83.53%
1993	25.47%	62.69%	88.17%
1994	54.81%	36.43%	91.24%

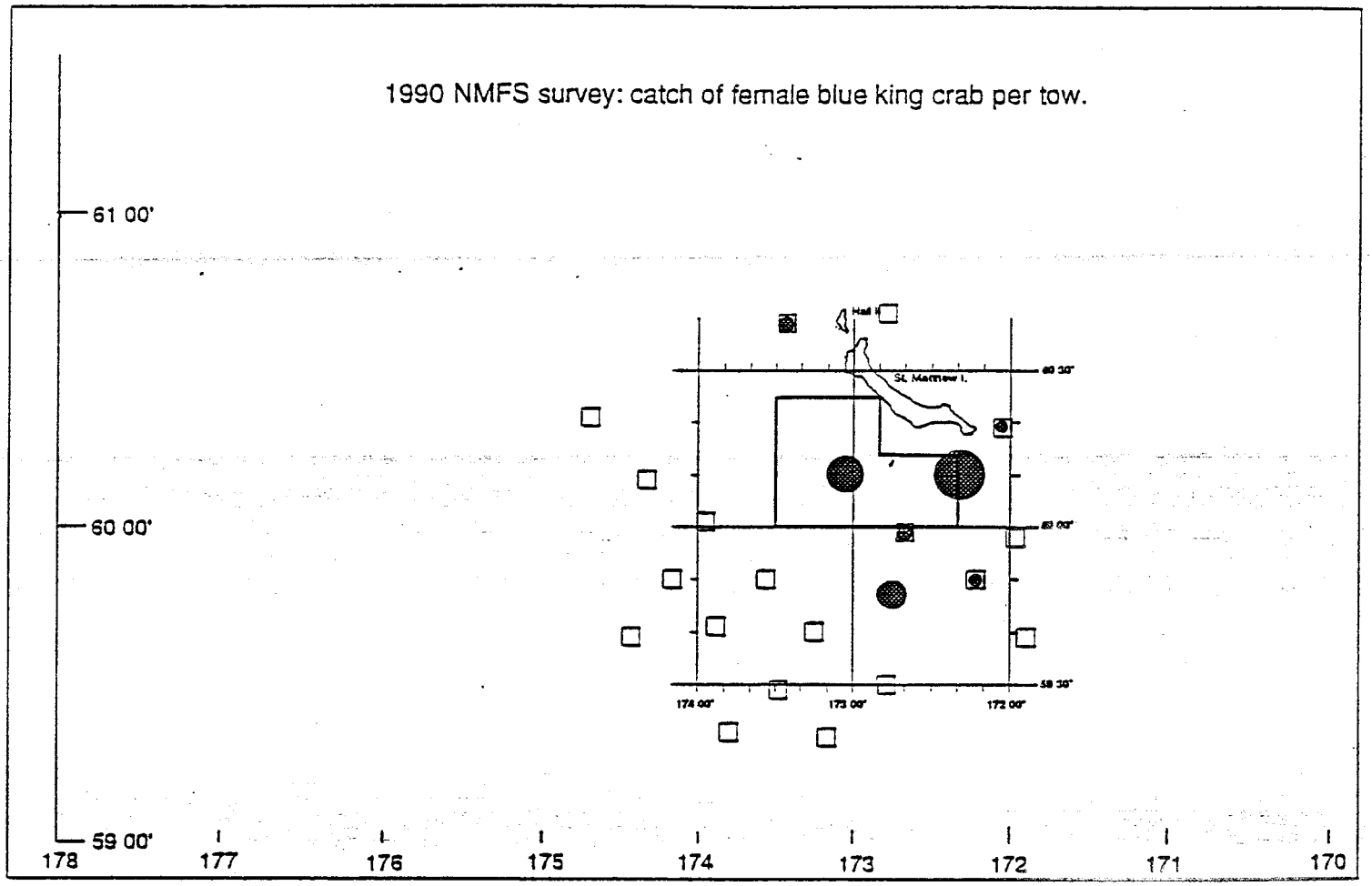
Appendix B.2. Number of blue king crabs harvested in Statistical Areas 726001 and 736001 relative to all other Statistical Areas in St. Matthew commercial fisheries, 1990-1994.

Fishery	% of Total 726001	% of Total 736001	% of Total Both
1990	28.58%	67.30%	95.88%
1991	38.44%	55.64%	94.08%
1992	58.10%	27.49%	85.59%
1993	25.50%	61.37%	86.87%
1994	55.88%	34.75%	90.63%

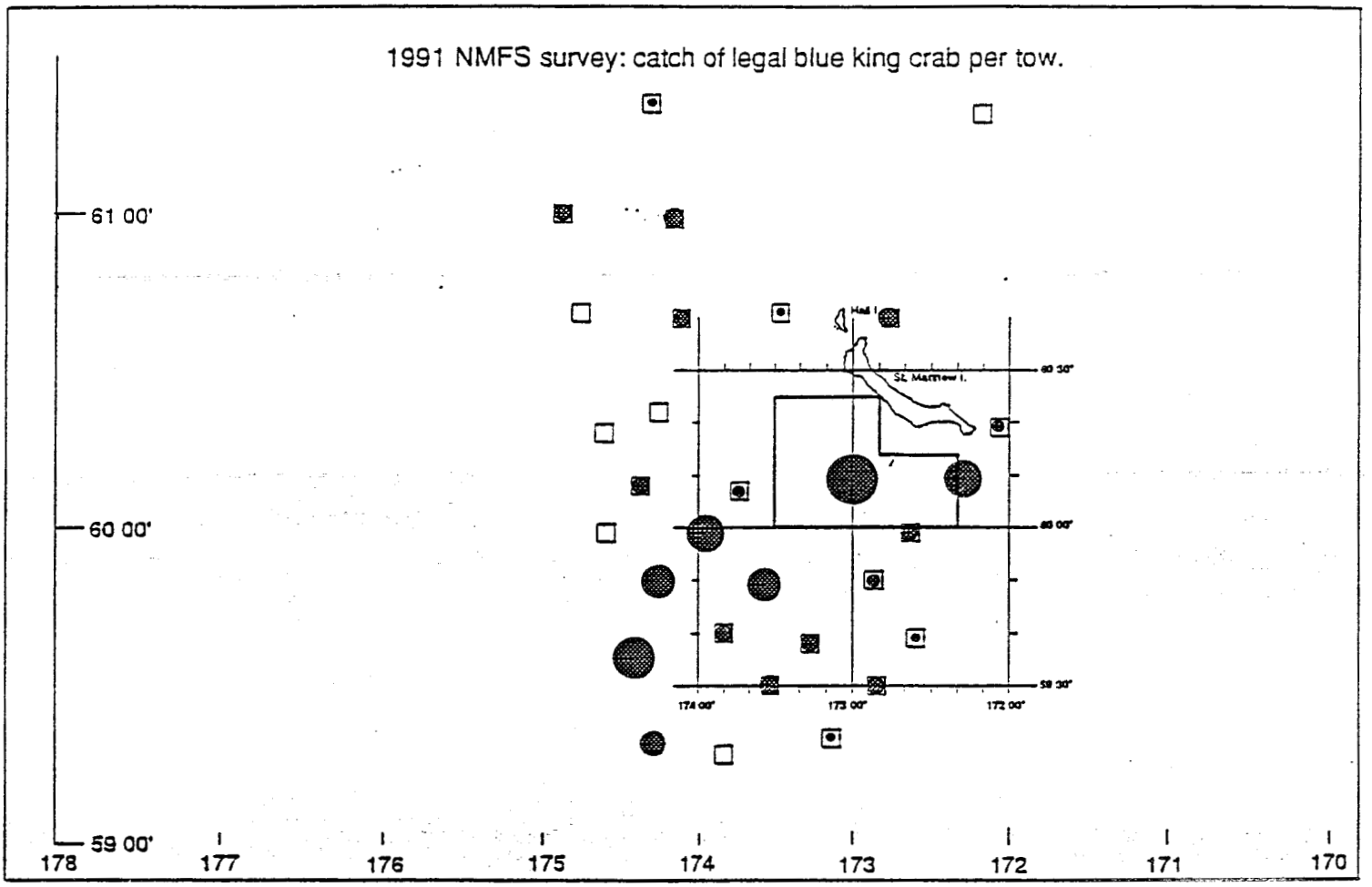
Appendix B.3. (Page 1 of 5) 1990 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of legal blue king crab in the tow (relative to other tows in that year).



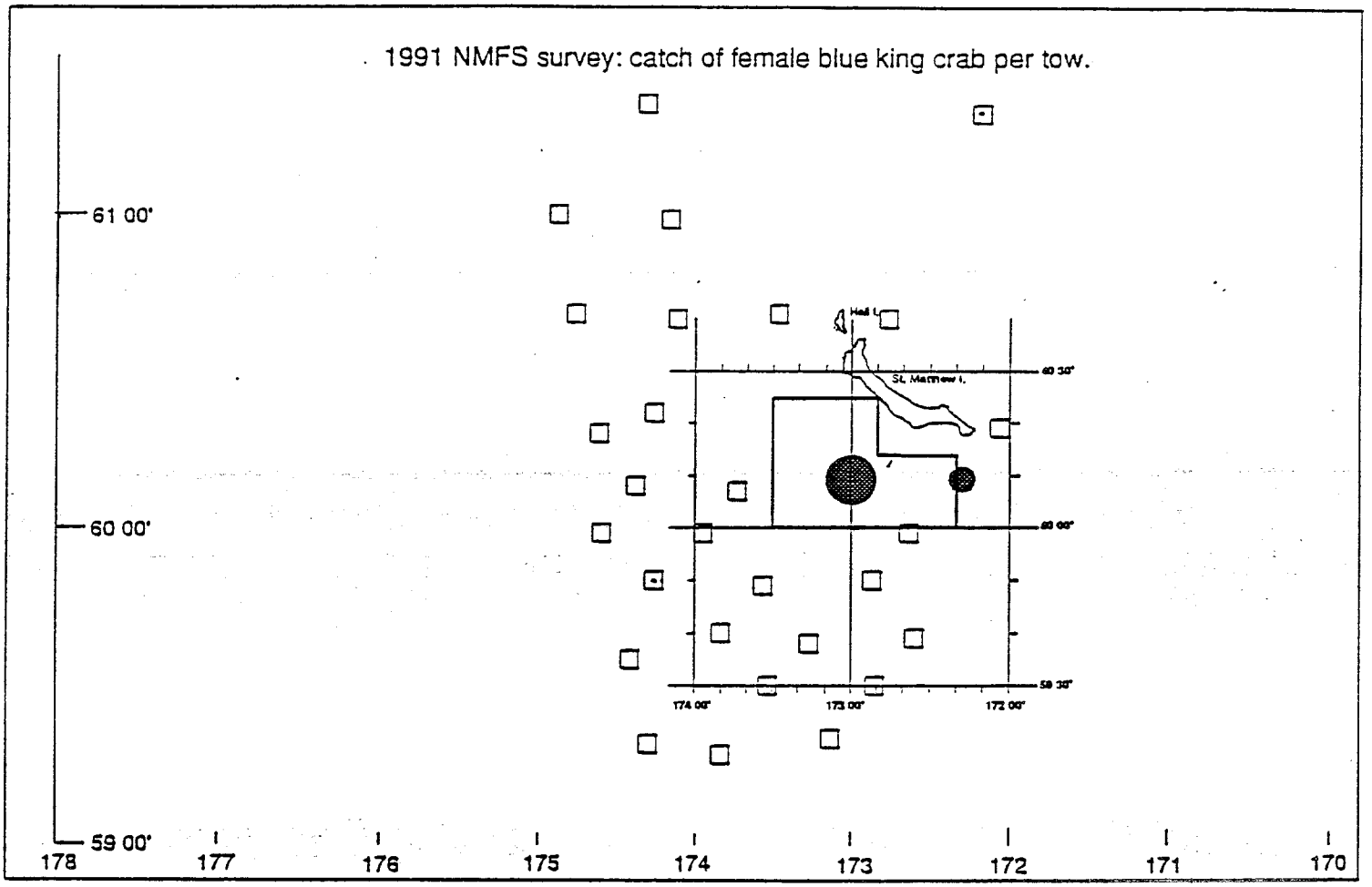
Appendix B.3. (Page 2 of 5) 1990 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of female blue king crab in the tow (relative to other tows in that year).



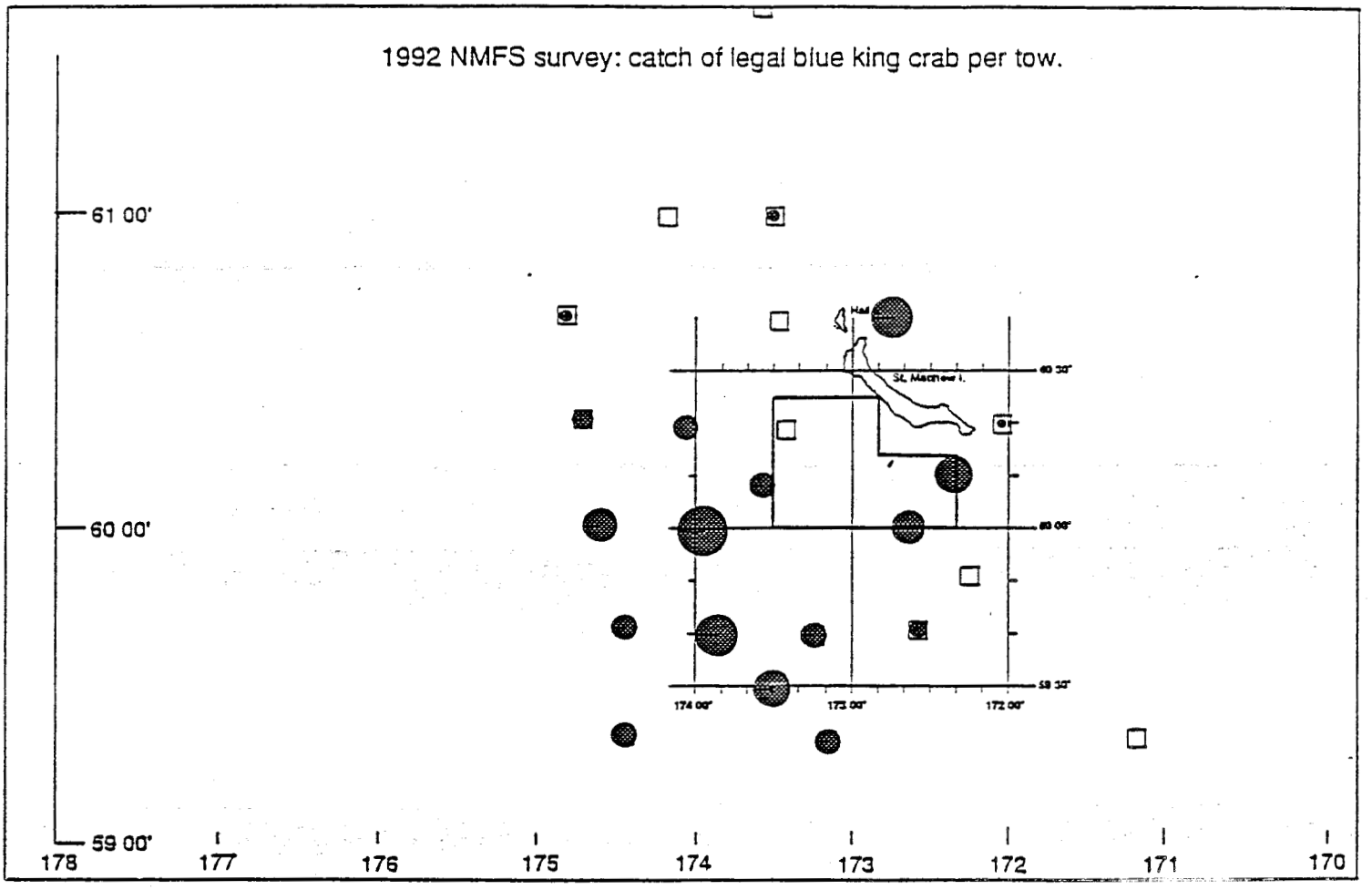
Appendix B.3. (Page 3 of 5) 1991 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of legal blue king crab in the tow (relative to other tows in that year).



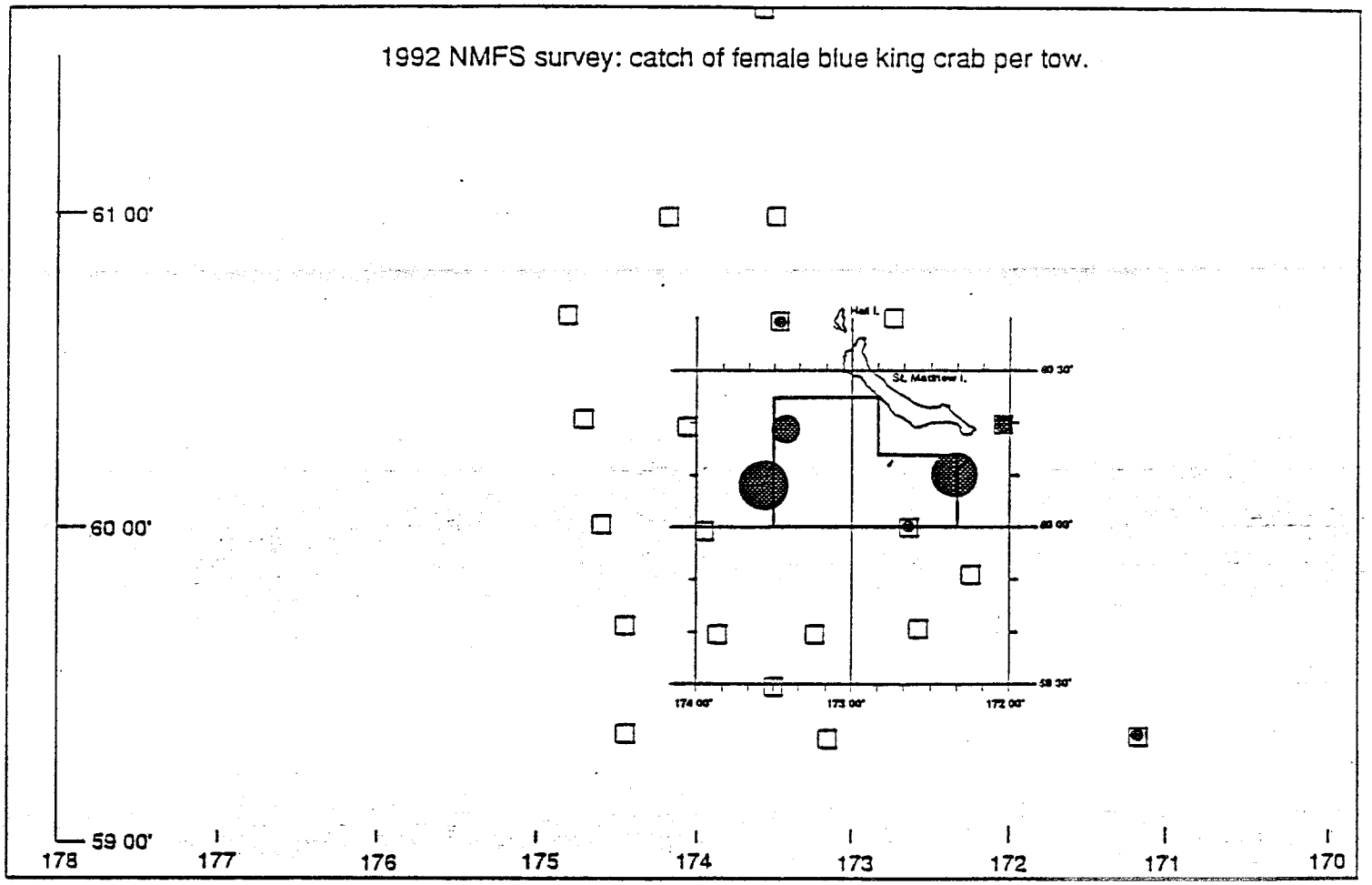
Appendix B.3. (Page 4 of 5) 1991 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of female blue king crab in the tow (relative to other tows in that year).



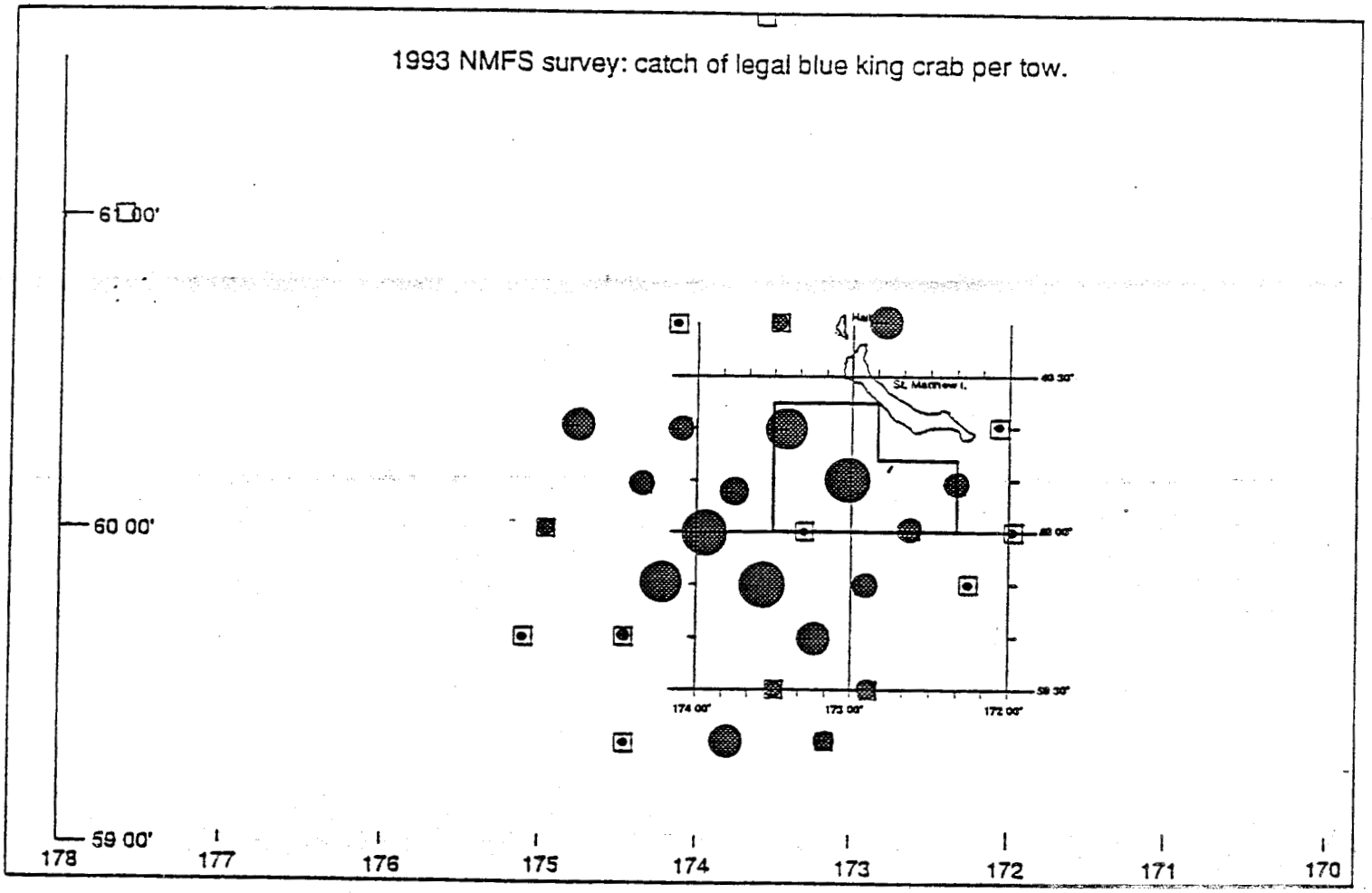
Appendix B.3. (Page 5 of 5) 1992 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of legal blue king crab in the tow (relative to other tows in that year).



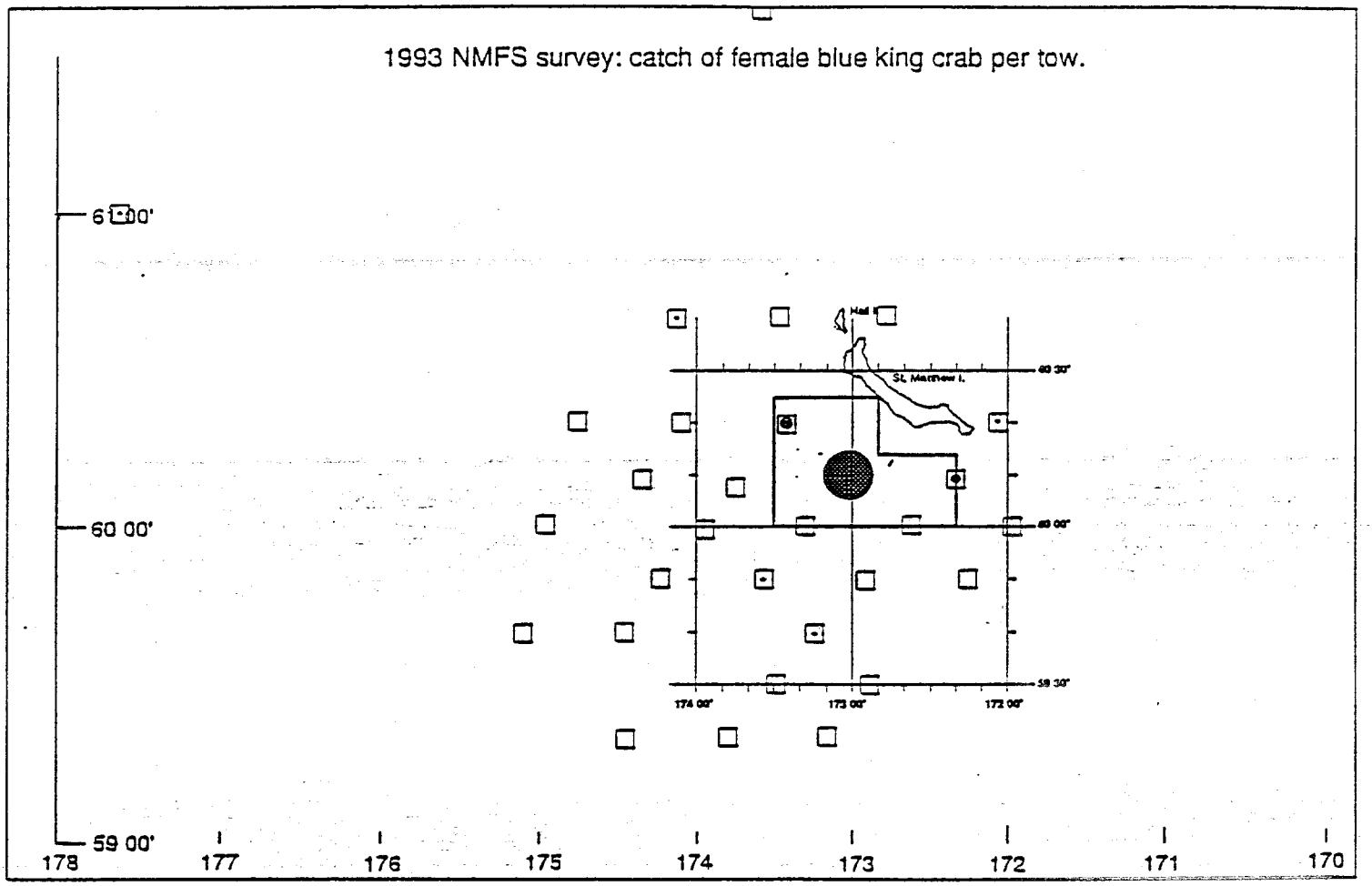
Appendix B.4. (Page 1 of 5) 1992 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of female blue king crab in the tow (relative to other tows in that year).



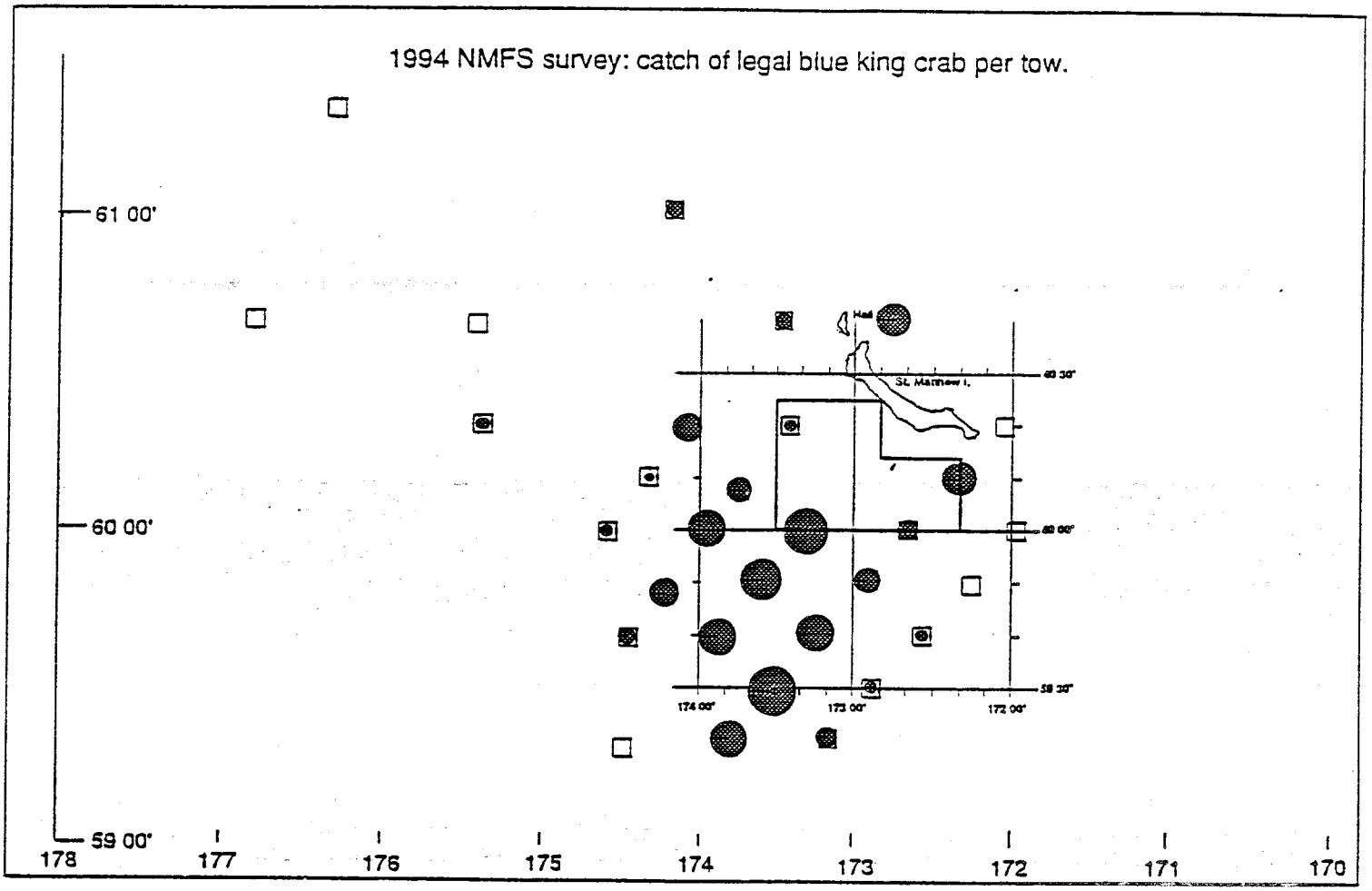
Appendix B.4. (Page 2 of 5) 1993 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of legal blue king crab in the tow (relative to other tows in that year).



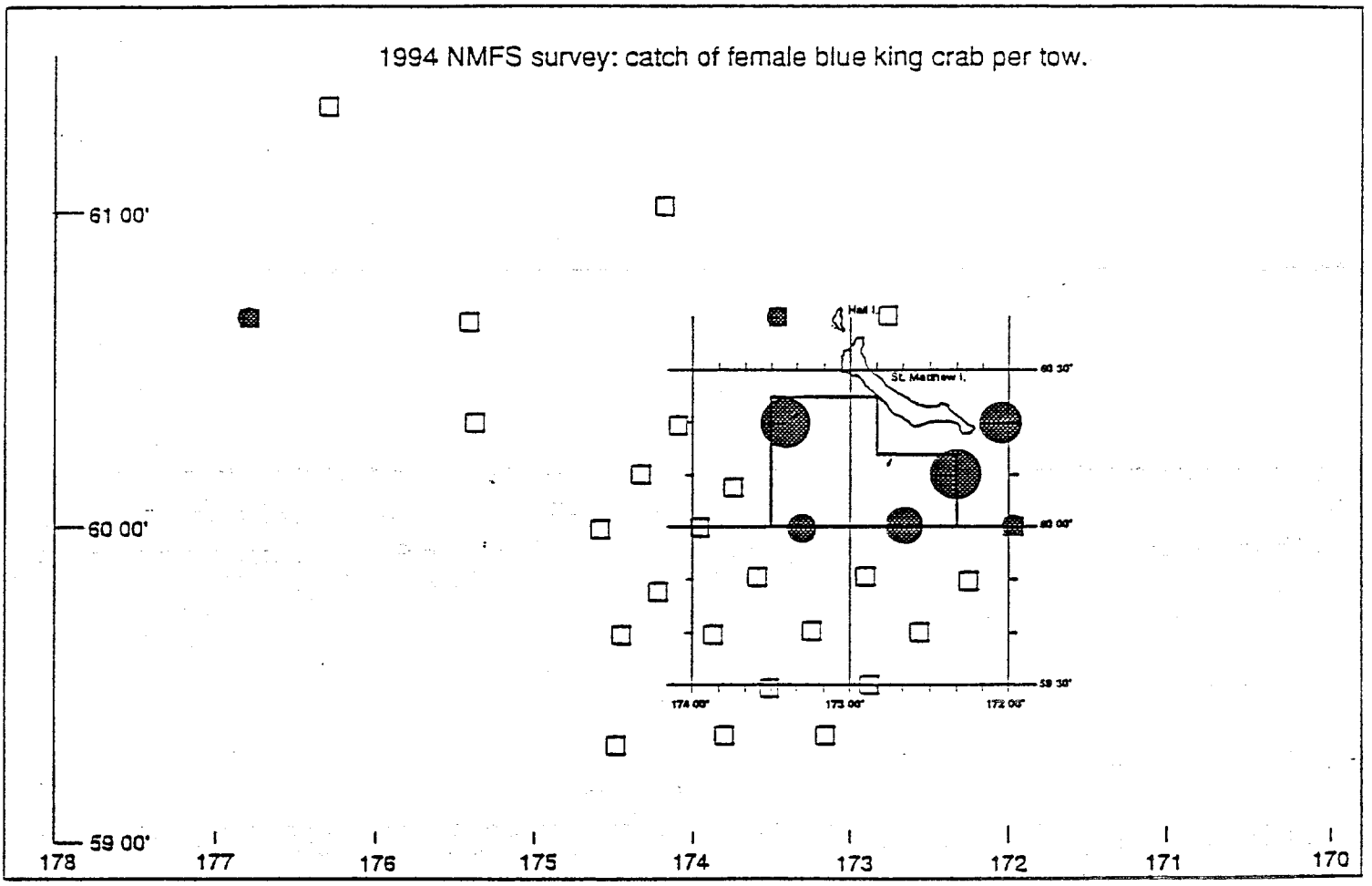
Appendix B.4. (Page 3 of 5) 1993 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of female blue king crab in the tow (relative to other tows in that year).



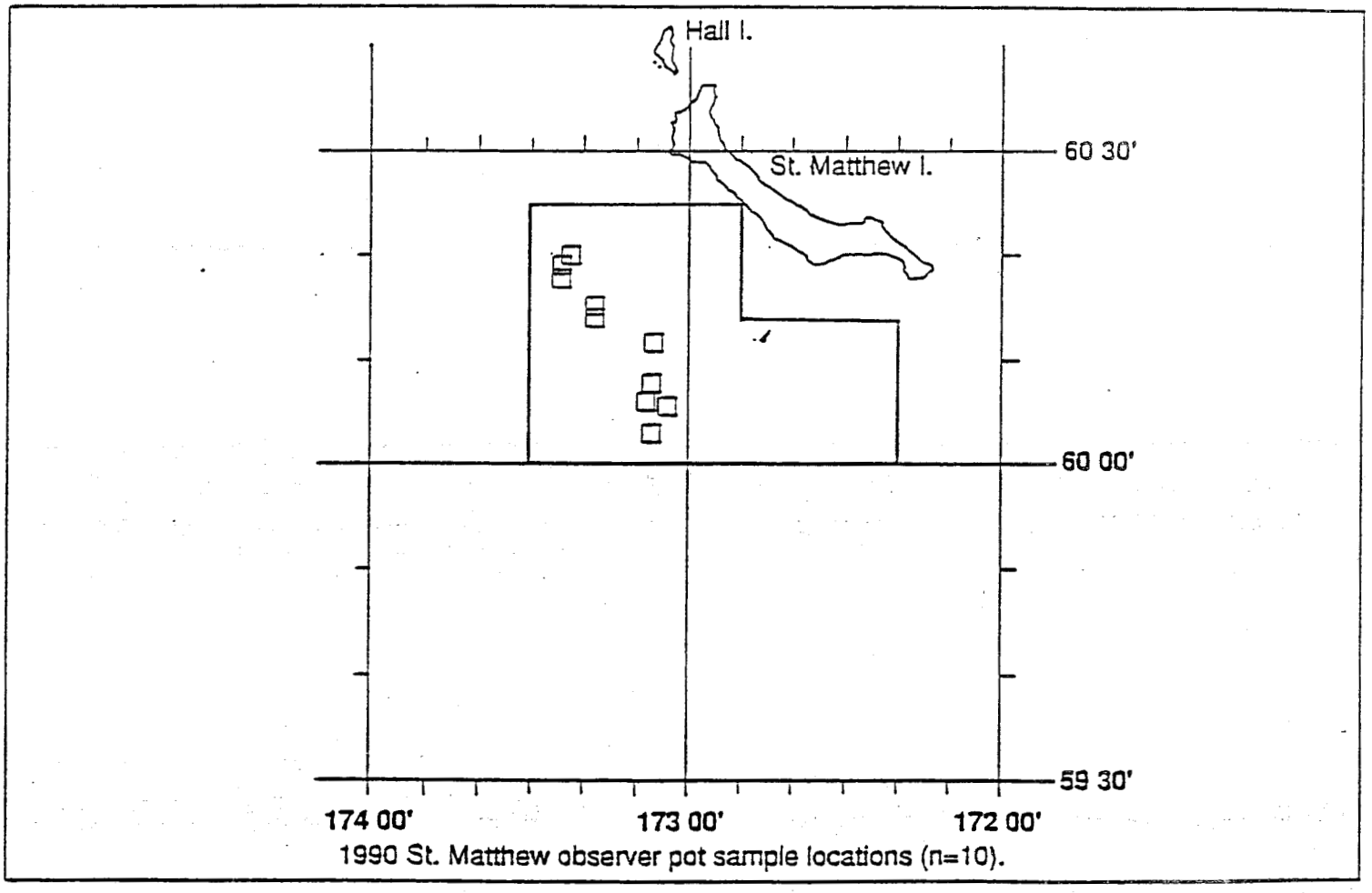
Appendix B.4. (Page 4 of 5) 1994 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of legal blue king crab in the tow (relative to other tows in that year).



Appendix B.4. (Page 5 of 5) 1994 NMFS survey trawl locations within 170°-178° W. longitude and 59°00'-60°30' N. latitude where blue king crab were caught. Empty squares denote trawl locations; size of overlaid circles are proportional to the catch of female blue king crab in the tow (relative to other tows in that year).

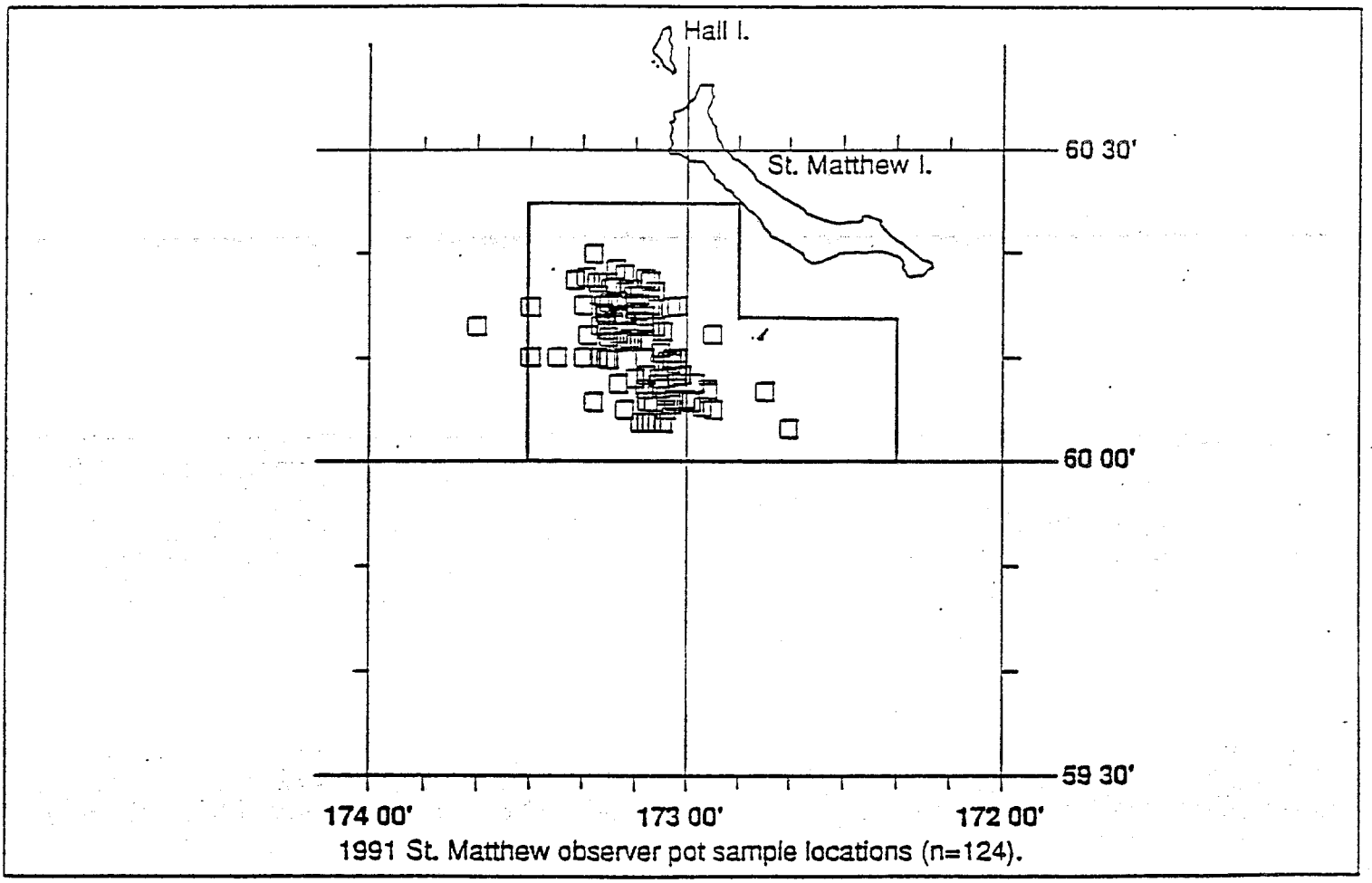


Appendix B.5. (Page 1 of 5) Locations of pots sampled by observers on catcher-processors during the 1990 St. Matthew blue king crab fishery.



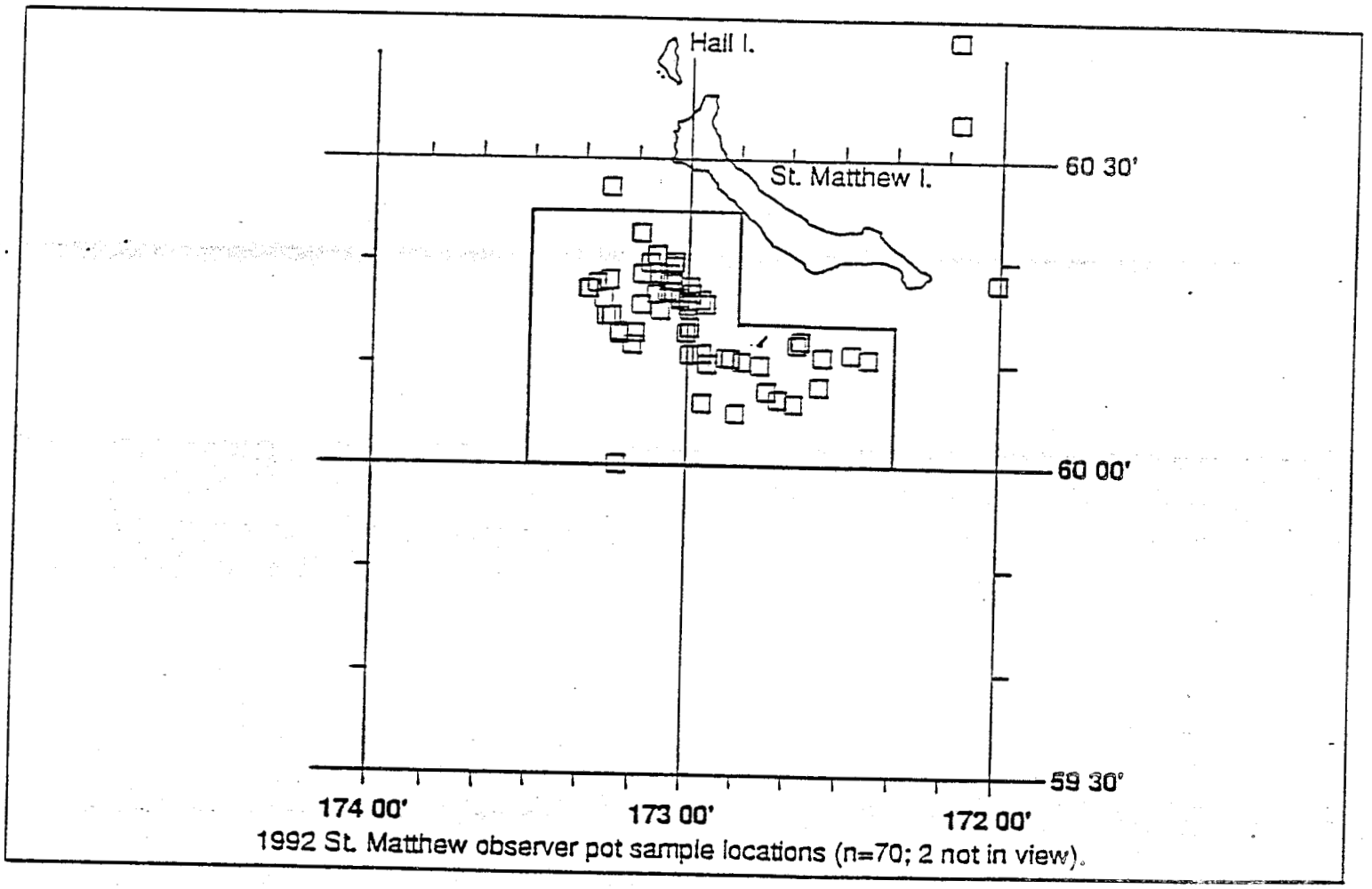
1990 St. Matthew observer pot sample locations (n=10).

Appendix B.5. (Page 2 of 5) Locations of pots sampled by observers on catcher-processors during the 1991 St. Matthew blue king crab fishery.



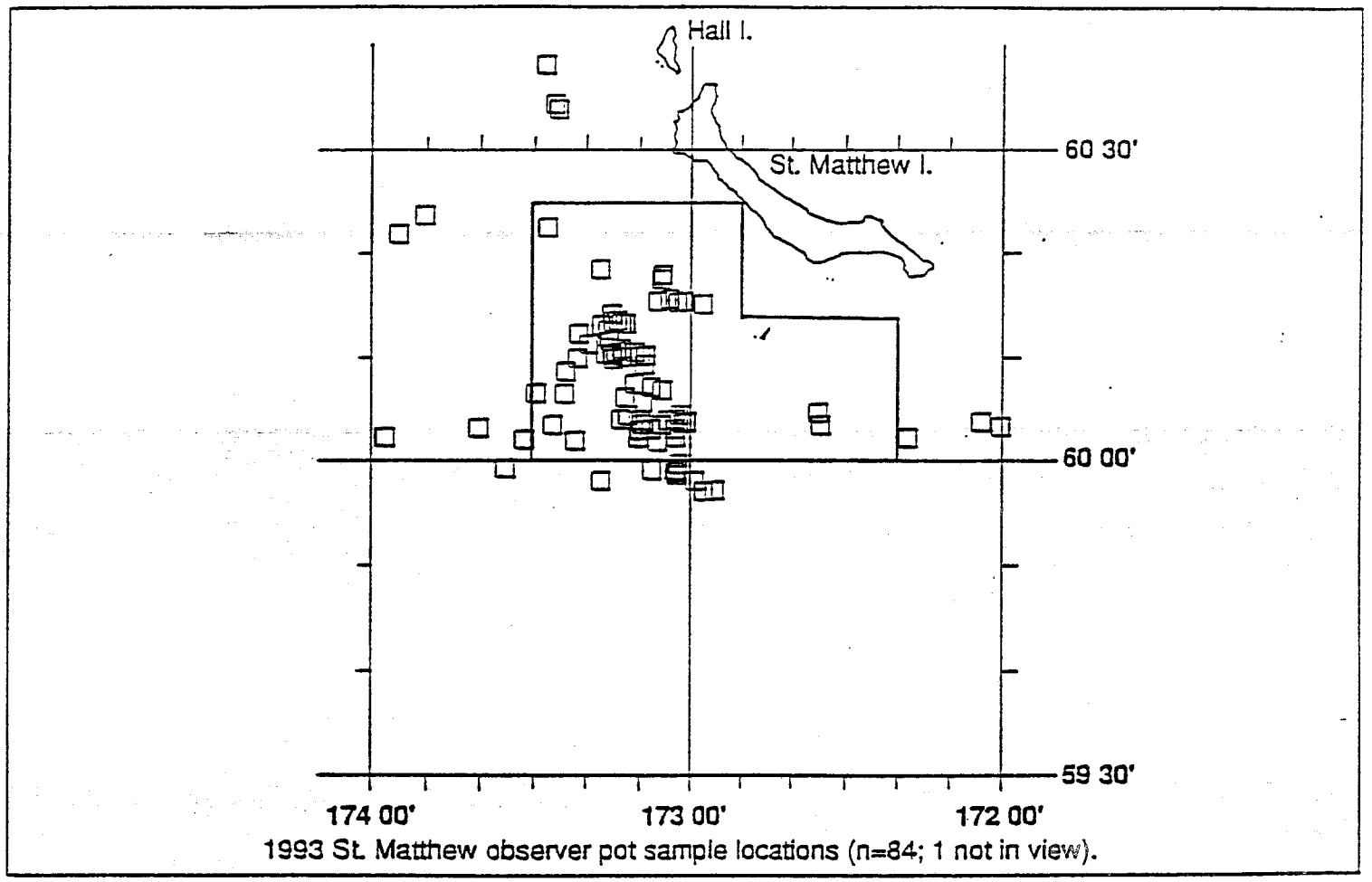
1991 St. Matthew observer pot sample locations (n=124).

Appendix B.5. (Page 3 of 5) Locations of pots sampled by observers on catcher-processors during the 1992 St. Matthew blue king crab fishery.



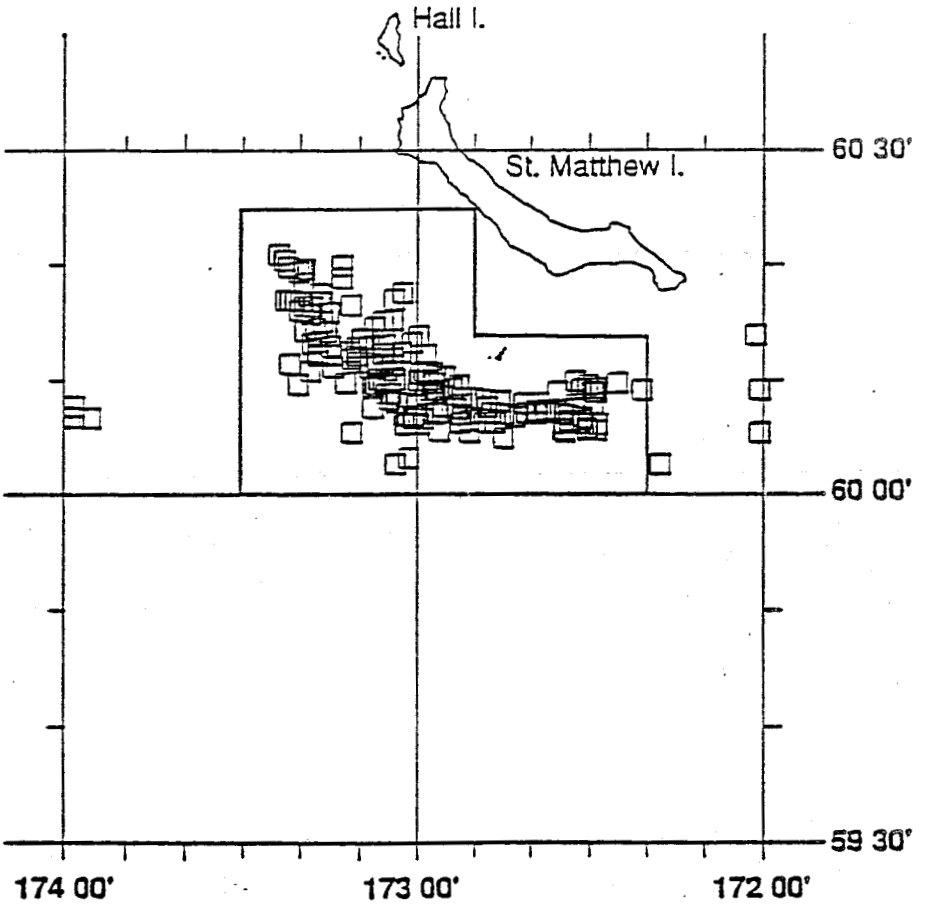
1992 St. Matthew observer pot sample locations (n=70; 2 not in view).

Appendix B.5. (Page 4 of 5) Locations of pots sampled by observers on catcher-processors during the 1993 St. Matthew blue king crab fishery.

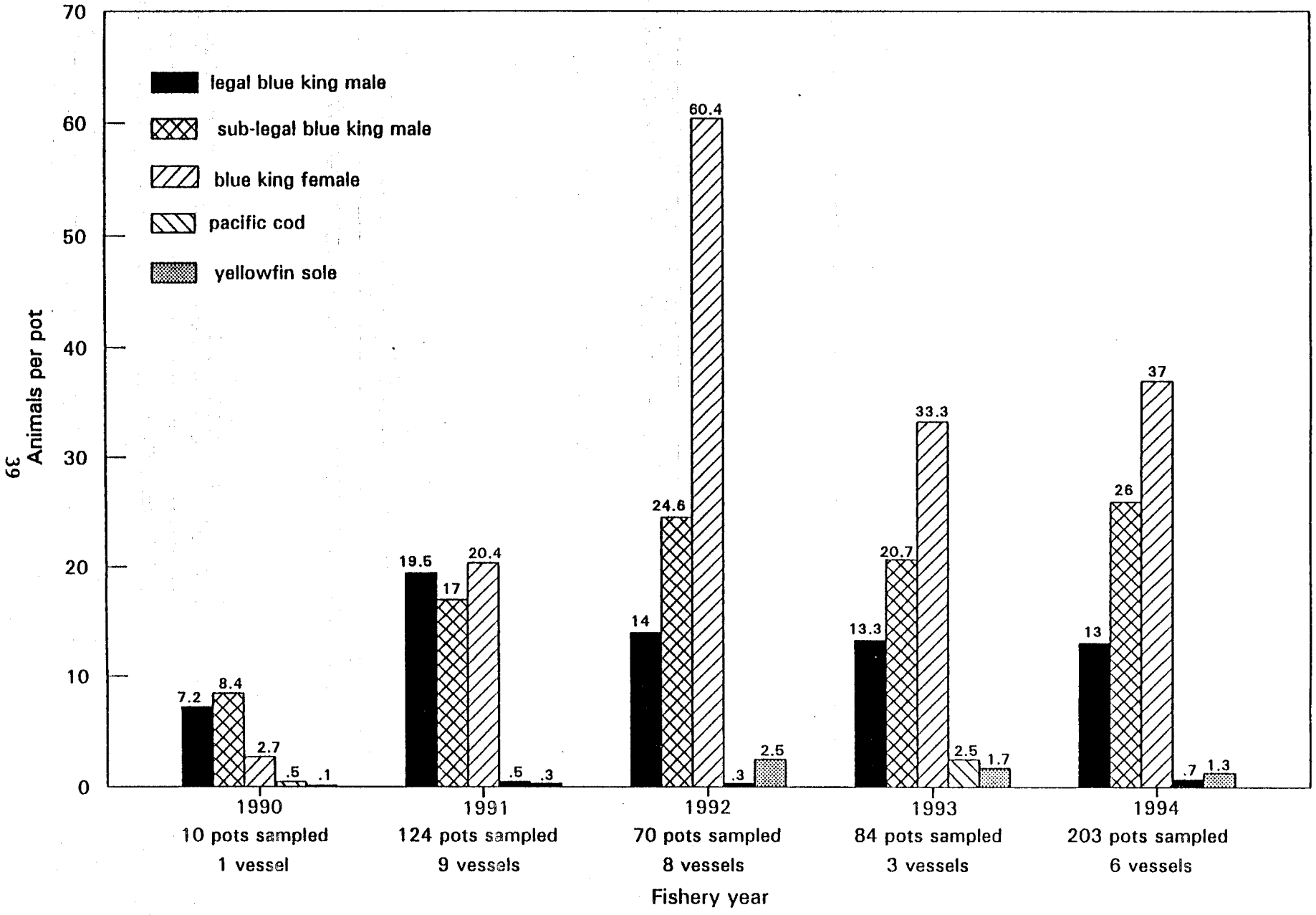


1993 St. Matthew observer pot sample locations (n=84; 1 not in view).

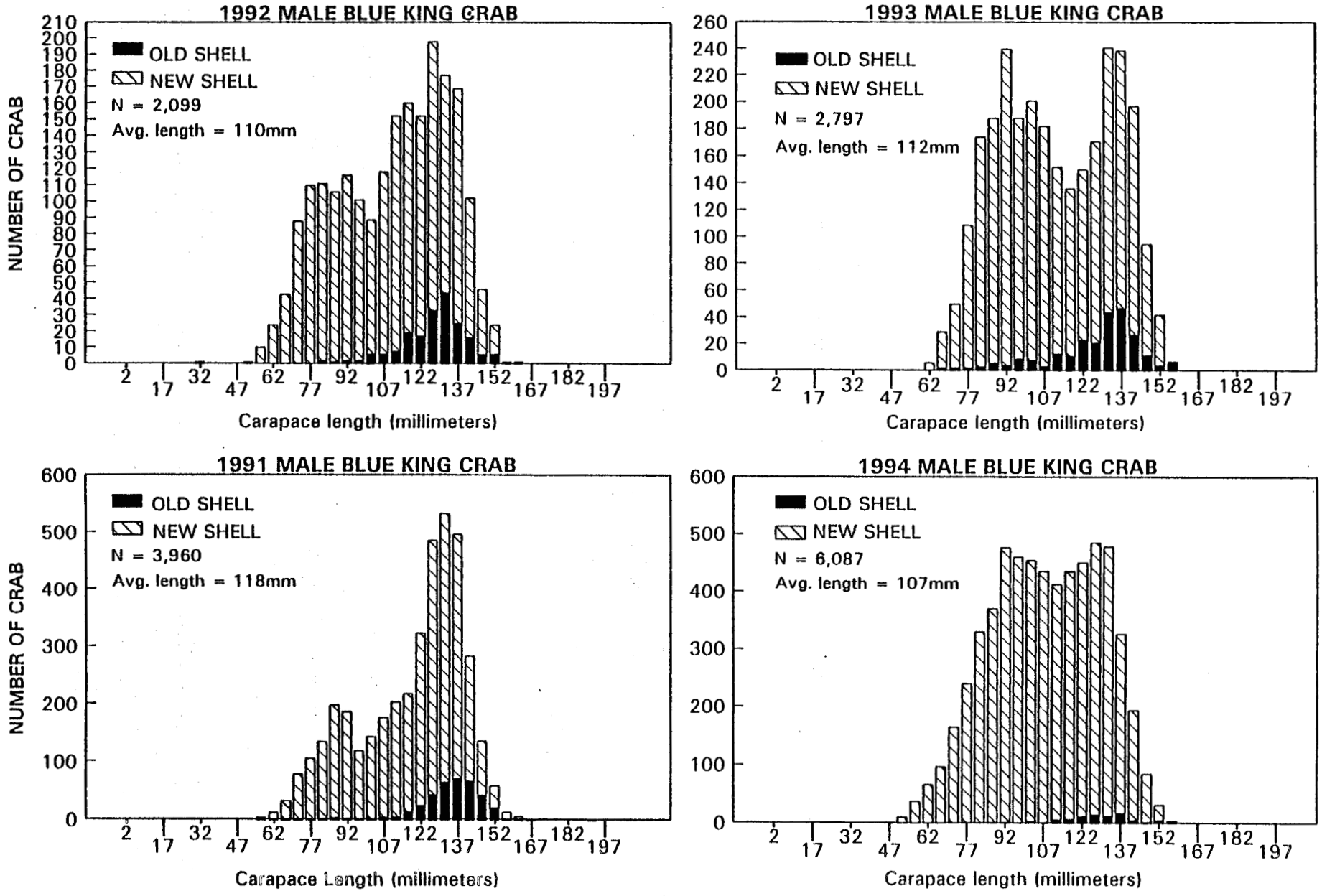
Appendix B.5. (Page 5 of 5) Locations of pots sampled by observers on catcher-processors during the 1994 St. Matthew blue king crab fishery.



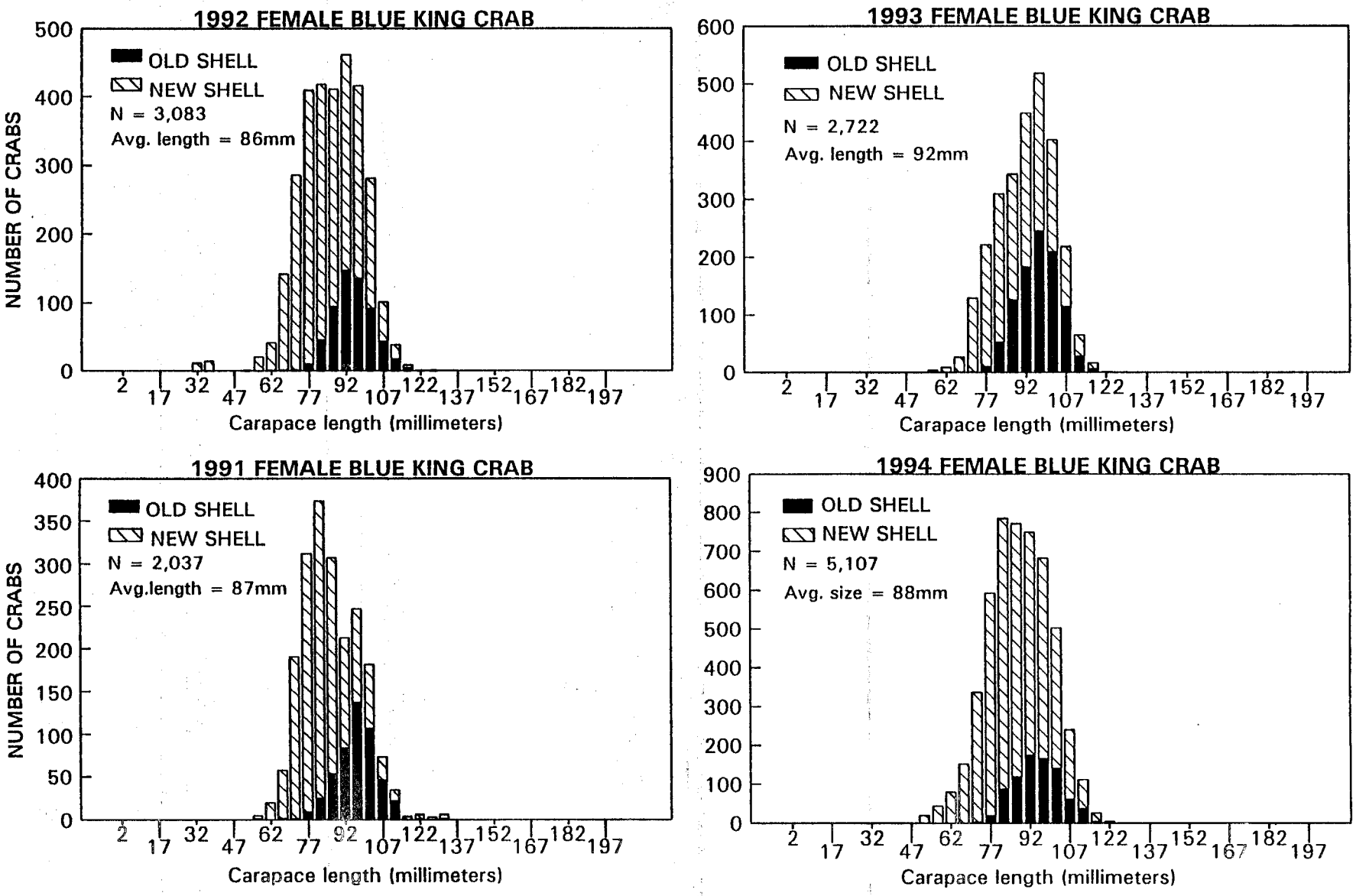
1994 St. Matthew observer pot sample locations (n=204).



Appendix B.6. Catch per pot of selected species (from the shellfish observer database) during the 1990, 1991,1992, 1993, and 1994 St. Matthew blue king crab fishery.



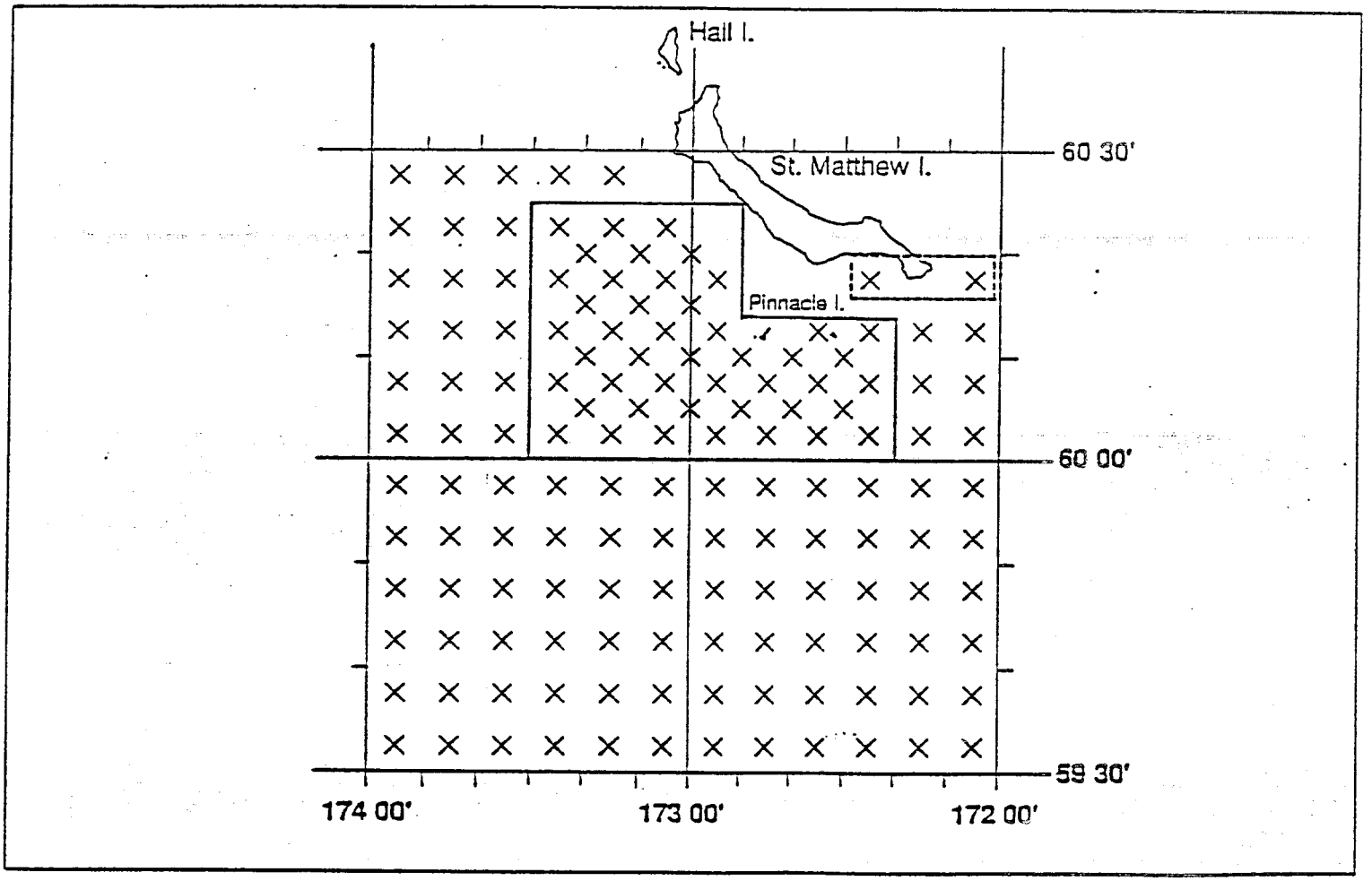
Appendix B.7. Carapace length distribution histograms of blue king crab males observed in the 1991, 1992, 1993, and 1994 St. Matthew fishery.



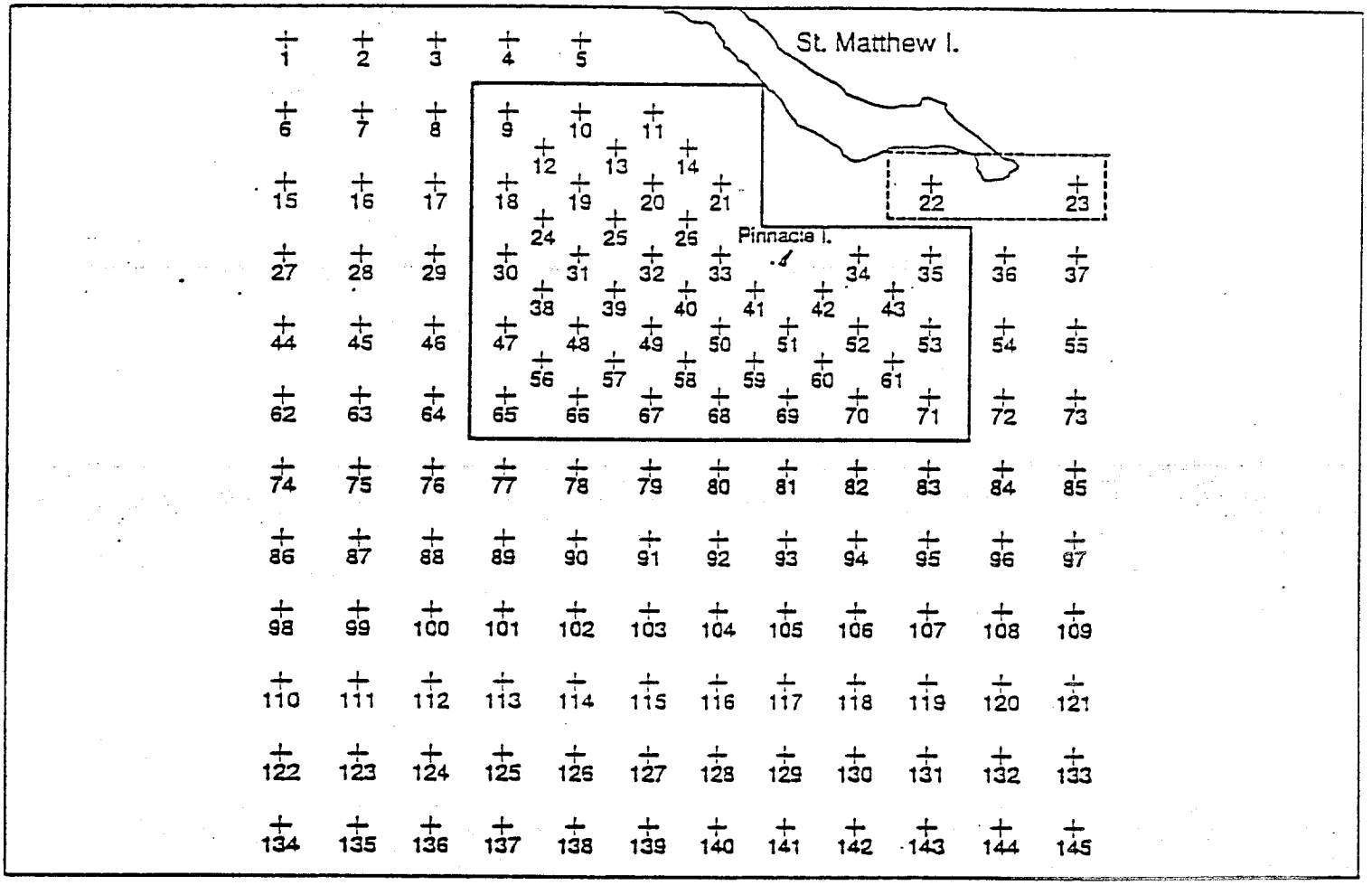
Appendix B.8. **Carapace length distribution histograms of blue king crab females observed in the 1991, 1992, 1993, and 1994 St. Matthew fishery.**

APPENDIX C: 1995 ST. MATTHEW BLUE KING CRAB SURVEY: STATION LOCATIONS, TAGGING STRATEGY, AND CONTINGENCY PLANS

Appendix C.1. 1995 St. Matthew blue king crab pot survey area. Centers of the 145 survey stations are denoted by crosses. Stations are spaced by 10' longitude and 5' latitude. Area inside of bold solid line denotes Stratum 2, area outside denotes Stratum 1. Stations inside of dashed line are optional.



Appendix C.2. Station numbering convention for 1995 St. Matthew blue king crab pot survey. Area inside of solid line denotes Stratum 2, area outside denotes Stratum 1. Stations inside of dashed line are optional.



Appendix C.3. Station locations for 1995 St. Matthew blue king crab pot survey. Locations are the center of pot string.

Station	Strata	Block	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
1	1	1	60	27.50	173	55.00
2	1	1	60	27.50	173	45.00
3	1	1	60	27.50	173	35.00
4	1	2	60	27.50	173	25.00
5	1	2	60	27.50	173	15.00
6	1	1	60	22.50	173	55.00
7	1	1	60	22.50	173	45.00
8	1	1	60	22.50	173	35.00
9	2	2	60	22.50	173	25.00
10	2	2	60	22.50	173	15.00
11	2	3	60	22.50	173	5.00
12	2	2	60	20.00	173	20.00
13	2	3	60	20.00	173	10.00
14	2	3	60	20.00	173	0.00
15	1	1	60	17.50	173	55.00
16	1	1	60	17.50	173	45.00
17	1	1	60	17.50	173	35.00
18	2	2	60	17.50	173	25.00
19	2	2	60	17.50	173	15.00
20	2	3	60	17.50	173	5.00
21	2	3	60	17.50	172	55.00
22	1	---------	60	17.50	172	25.00
23	1	---------	60	17.50	172	5.00
24	2	2	60	15.00	173	20.00
25	2	3	60	15.00	173	10.00
26	2	3	60	15.00	173	0.00
27	1	4	60	12.50	173	55.00
28	1	4	60	12.50	173	45.00
29	1	4	60	12.50	173	35.00
30	2	5	60	12.50	173	25.00
31	2	5	60	12.50	173	15.00
32	2	6	60	12.50	173	5.00
33	2	6	60	12.50	172	55.00
34	2	7	60	12.50	172	35.00
35	2	8	60	12.50	172	25.00
36	1	8	60	12.50	172	15.00
37	1	8	60	12.50	172	5.00
38	2	5	60	10.00	173	20.00
39	2	5	60	10.00	173	10.00
40	2	6	60	10.00	173	0.00
41	2	6	60	10.00	172	50.00
42	2	7	60	10.00	172	40.00
43	2	7	60	10.00	172	30.00
44	1	4	60	7.50	173	55.00
45	1	4	60	7.50	173	45.00
46	1	4	60	7.50	173	35.00
47	2	5	60	7.50	173	25.00

Appendix C.3.
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Station locations for 1995 St. Matthew blue king crab pot survey. Locations are the center of pot string.

Station	Strata	Block	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
48	2	5	60	7.50	173	15.00
49	2	6	60	7.50	173	5.00
50	2	6	60	7.50	172	55.00
51	2	7	60	7.50	172	45.00
52	2	7	60	7.50	172	35.00
53	2	8	60	7.50	172	25.00
54	1	8	60	7.50	172	15.00
55	1	8	60	7.50	172	5.00
56	2	5	60	5.00	173	20.00
57	2	5	60	5.00	173	10.00
58	2	6	60	5.00	173	0.00
59	2	6	60	5.00	172	50.00
60	2	7	60	5.00	172	40.00
61	2	7	60	5.00	172	30.00
62	1	4	60	2.50	173	55.00
63	1	4	60	2.50	173	45.00
64	1	4	60	2.50	173	35.00
65	2	5	60	2.50	173	25.00
66	2	5	60	2.50	173	15.00
67	2	6	60	2.50	173	5.00
68	2	6	60	2.50	172	55.00
69	2	7	60	2.50	172	45.00
70	2	7	60	2.50	172	35.00
71	2	8	60	2.50	172	25.00
72	1	8	60	2.50	172	15.00
73	1	8	60	2.50	172	5.00
74	1	9	59	57.50	173	55.00
75	1	9	59	57.50	173	45.00
76	1	9	59	57.50	173	35.00
77	1	10	59	57.50	173	25.00
78	1	10	59	57.50	173	15.00
79	1	10	59	57.50	173	5.00
80	1	11	59	57.50	172	55.00
81	1	11	59	57.50	172	45.00
82	1	11	59	57.50	172	35.00
83	1	12	59	57.50	172	25.00
84	1	12	59	57.50	172	15.00
85	1	12	59	57.50	172	5.00
86	1	9	59	52.50	173	55.00
87	1	9	59	52.50	173	45.00
88	1	9	59	52.50	173	35.00
89	1	10	59	52.50	173	25.00
90	1	10	59	52.50	173	15.00
91	1	10	59	52.50	173	5.00
92	1	11	59	52.50	172	55.00
93	1	11	59	52.50	172	45.00
94	1	11	59	52.50	172	35.00

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Station locations for 1995 St. Matthew blue king crab pot survey. Locations are the center of pot string.

Station	Strata	Block	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
95	1	12	59	52.50	172	25.00
96	1	12	59	52.50	172	15.00
97	1	12	59	52.50	172	5.00
98	1	9	59	47.50	173	55.00
99	1	9	59	47.50	173	45.00
100	1	9	59	47.50	173	35.00
101	1	10	59	47.50	173	25.00
102	1	10	59	47.50	173	15.00
103	1	10	59	47.50	173	5.00
104	1	11	59	47.50	172	55.00
105	1	11	59	47.50	172	45.00
106	1	11	59	47.50	172	35.00
107	1	12	59	47.50	172	25.00
108	1	12	59	47.50	172	15.00
109	1	12	59	47.50	172	5.00
110	1	13	59	42.50	173	55.00
111	1	13	59	42.50	173	45.00
112	1	13	59	42.50	173	35.00
113	1	14	59	42.50	173	25.00
114	1	14	59	42.50	173	15.00
115	1	14	59	42.50	173	5.00
116	1	15	59	42.50	172	55.00
117	1	15	59	42.50	172	45.00
118	1	15	59	42.50	172	35.00
119	1	16	59	42.50	172	25.00
120	1	16	59	42.50	172	15.00
121	1	16	59	42.50	172	5.00
122	1	13	59	37.50	173	55.00
123	1	13	59	37.50	173	45.00
124	1	13	59	37.50	173	35.00
125	1	14	59	37.50	173	25.00
126	1	14	59	37.50	173	15.00
127	1	14	59	37.50	173	5.00
128	1	15	59	37.50	172	55.00
129	1	15	59	37.50	172	45.00
130	1	15	59	37.50	172	35.00
131	1	16	59	37.50	172	25.00
132	1	16	59	37.50	172	15.00
133	1	16	59	37.50	172	5.00
134	1	13	59	32.50	173	55.00
135	1	13	59	32.50	173	45.00
136	1	13	59	32.50	173	35.00
137	1	14	59	32.50	173	25.00
138	1	14	59	32.50	173	15.00
139	1	14	59	32.50	173	5.00
140	1	15	59	32.50	172	55.00
141	1	15	59	32.50	172	45.00

Appendix C.3.
(Page 4 of 4) Station locations for 1995 St. Matthew blue king crab pot survey. Locations are the center of pot string.

Station	Strata	Block	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
142	1	15	59	32.50	172	35.00
143	1	16	59	32.50	172	25.00
144	1	16	59	32.50	172	15.00
145	1	16	59	32.50	172	5.00

Appendix C.4. Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
1	1	60	27.69	173	55.00
1	2	60	27.56	173	55.00
1	3	60	27.44	173	55.00
1	4	60	27.31	173	55.00
2	1	60	27.69	173	45.00
2	2	60	27.56	173	45.00
2	3	60	27.44	173	45.00
2	4	60	27.31	173	45.00
3	1	60	27.69	173	35.00
3	2	60	27.56	173	35.00
3	3	60	27.44	173	35.00
3	4	60	27.31	173	35.00
4	1	60	27.69	173	25.00
4	2	60	27.56	173	25.00
4	3	60	27.44	173	25.00
4	4	60	27.31	173	25.00
5	1	60	27.69	173	15.00
5	2	60	27.56	173	15.00
5	3	60	27.44	173	15.00
5	4	60	27.31	173	15.00
6	1	60	22.69	173	55.00
6	2	60	22.56	173	55.00
6	3	60	22.44	173	55.00
6	4	60	22.31	173	55.00
7	1	60	22.69	173	45.00
7	2	60	22.56	173	45.00
7	3	60	22.44	173	45.00
7	4	60	22.31	173	45.00
8	1	60	22.69	173	35.00
8	2	60	22.56	173	35.00
8	3	60	22.44	173	35.00
8	4	60	22.31	173	35.00
9	1	60	22.69	173	25.00
9	2	60	22.56	173	25.00
9	3	60	22.44	173	25.00
9	4	60	22.31	173	25.00
10	1	60	22.69	173	15.00
10	2	60	22.56	173	15.00
10	3	60	22.44	173	15.00
10	4	60	22.31	173	15.00
11	1	60	22.69	173	5.00
11	2	60	22.56	173	5.00
11	3	60	22.44	173	5.00
11	4	60	22.31	173	5.00
12	1	60	20.19	173	20.00
12	2	60	20.06	173	20.00
12	3	60	19.94	173	20.00
12	4	60	19.81	173	20.00
13	1	60	20.19	173	10.00
13	2	60	20.06	173	10.00
13	3	60	19.94	173	10.00

Appendix C.4.
(Page 2 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
13	4	60	19.81	173	10.00
14	1	60	20.19	173	0.00
14	2	60	20.06	173	0.00
14	3	60	19.94	173	0.00
14	4	60	19.81	173	0.00
15	1	60	17.69	173	55.00
15	2	60	17.56	173	55.00
15	3	60	17.44	173	55.00
15	4	60	17.31	173	55.00
16	1	60	17.69	173	45.00
16	2	60	17.56	173	45.00
16	3	60	17.44	173	45.00
16	4	60	17.31	173	45.00
17	1	60	17.69	173	35.00
17	2	60	17.56	173	35.00
17	3	60	17.44	173	35.00
17	4	60	17.31	173	35.00
18	1	60	17.69	173	25.00
18	2	60	17.56	173	25.00
18	3	60	17.44	173	25.00
18	4	60	17.31	173	25.00
19	1	60	17.69	173	15.00
19	2	60	17.56	173	15.00
19	3	60	17.44	173	15.00
19	4	60	17.31	173	15.00
20	1	60	17.69	173	5.00
20	2	60	17.56	173	5.00
20	3	60	17.44	173	5.00
20	4	60	17.31	173	5.00
21	1	60	17.69	172	55.00
21	2	60	17.56	172	55.00
21	3	60	17.44	172	55.00
21	4	60	17.31	172	55.00
22	1	60	17.69	172	25.00
22	2	60	17.56	172	25.00
22	3	60	17.44	172	25.00
22	4	60	17.31	172	25.00
23	1	60	17.69	172	5.00
23	2	60	17.56	172	5.00
23	3	60	17.44	172	5.00
23	4	60	17.31	172	5.00
24	1	60	15.19	173	20.00
24	2	60	15.06	173	20.00
24	3	60	14.94	173	20.00
24	4	60	14.81	173	20.00
25	1	60	15.19	173	10.00
25	2	60	15.06	173	10.00
25	3	60	14.94	173	10.00
25	4	60	14.81	173	10.00
26	1	60	15.19	173	0.00
26	2	60	15.06	173	0.00

Appendix C.4.
(Page 3 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
26	3	60	14.94	173	0.00
26	4	60	14.81	173	0.00
27	1	60	12.69	173	55.00
27	2	60	12.56	173	55.00
27	3	60	12.44	173	55.00
27	4	60	12.31	173	55.00
28	1	60	12.69	173	45.00
28	2	60	12.56	173	45.00
28	3	60	12.44	173	45.00
28	4	60	12.31	173	45.00
29	1	60	12.69	173	35.00
29	2	60	12.56	173	35.00
29	3	60	12.44	173	35.00
29	4	60	12.31	173	35.00
30	1	60	12.69	173	25.00
30	2	60	12.56	173	25.00
30	3	60	12.44	173	25.00
30	4	60	12.31	173	25.00
31	1	60	12.69	173	15.00
31	2	60	12.56	173	15.00
31	3	60	12.44	173	15.00
31	4	60	12.31	173	15.00
32	1	60	12.69	173	5.00
32	2	60	12.56	173	5.00
32	3	60	12.44	173	5.00
32	4	60	12.31	173	5.00
33	1	60	12.69	172	55.00
33	2	60	12.56	172	55.00
33	3	60	12.44	172	55.00
33	4	60	12.31	172	55.00
34	1	60	12.69	172	35.00
34	2	60	12.56	172	35.00
34	3	60	12.44	172	35.00
34	4	60	12.31	172	35.00
35	1	60	12.69	172	25.00
35	2	60	12.56	172	25.00
35	3	60	12.44	172	25.00
35	4	60	12.31	172	25.00
36	1	60	12.69	172	15.00
36	2	60	12.56	172	15.00
36	3	60	12.44	172	15.00
36	4	60	12.31	172	15.00
37	1	60	12.69	172	5.00
37	2	60	12.56	172	5.00
37	3	60	12.44	172	5.00
37	4	60	12.31	172	5.00
38	1	60	10.19	173	20.00
38	2	60	10.06	173	20.00
38	3	60	9.94	173	20.00
38	4	60	9.81	173	20.00
39	1	60	10.19	173	10.00

Appendix C.4.
(Page 4 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
39	2	60	10.06	173	10.00
39	3	60	9.94	173	10.00
39	4	60	9.81	173	10.00
40	1	60	10.19	173	0.00
40	2	60	10.06	173	0.00
40	3	60	9.94	173	0.00
40	4	60	9.81	173	0.00
41	1	60	10.19	172	50.00
41	2	60	10.06	172	50.00
41	3	60	9.94	172	50.00
41	4	60	9.81	172	50.00
42	1	60	10.19	172	40.00
42	2	60	10.06	172	40.00
42	3	60	9.94	172	40.00
42	4	60	9.81	172	40.00
43	1	60	10.19	172	30.00
43	2	60	10.06	172	30.00
43	3	60	9.94	172	30.00
43	4	60	9.81	172	30.00
44	1	60	7.69	173	55.00
44	2	60	7.56	173	55.00
44	3	60	7.44	173	55.00
44	4	60	7.31	173	55.00
45	1	60	7.69	173	45.00
45	2	60	7.56	173	45.00
45	3	60	7.44	173	45.00
45	4	60	7.31	173	45.00
46	1	60	7.69	173	35.00
46	2	60	7.56	173	35.00
46	3	60	7.44	173	35.00
46	4	60	7.31	173	35.00
47	1	60	7.69	173	25.00
47	2	60	7.56	173	25.00
47	3	60	7.44	173	25.00
47	4	60	7.31	173	25.00
48	1	60	7.69	173	15.00
48	2	60	7.56	173	15.00
48	3	60	7.44	173	15.00
48	4	60	7.31	173	15.00
49	1	60	7.69	173	5.00
49	2	60	7.56	173	5.00
49	3	60	7.44	173	5.00
49	4	60	7.31	173	5.00
50	1	60	7.69	172	55.00
50	2	60	7.56	172	55.00
50	3	60	7.44	172	55.00
50	4	60	7.31	172	55.00
51	1	60	7.69	172	45.00
51	2	60	7.56	172	45.00
51	3	60	7.44	172	45.00
51	4	60	7.31	172	45.00

Appendix C.4.
(Page 5 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
52	1	60	7.69	172	35.00
52	2	60	7.56	172	35.00
52	3	60	7.44	172	35.00
52	4	60	7.31	172	35.00
53	1	60	7.69	172	25.00
53	2	60	7.56	172	25.00
53	3	60	7.44	172	25.00
53	4	60	7.31	172	25.00
54	1	60	7.69	172	15.00
54	2	60	7.56	172	15.00
54	3	60	7.44	172	15.00
54	4	60	7.31	172	15.00
55	1	60	7.69	172	5.00
55	2	60	7.56	172	5.00
55	3	60	7.44	172	5.00
55	4	60	7.31	172	5.00
56	1	60	5.19	173	20.00
56	2	60	5.06	173	20.00
56	3	60	4.94	173	20.00
56	4	60	4.81	173	20.00
57	1	60	5.19	173	10.00
57	2	60	5.06	173	10.00
57	3	60	4.94	173	10.00
57	4	60	4.81	173	10.00
58	1	60	5.19	173	0.00
58	2	60	5.06	173	0.00
58	3	60	4.94	173	0.00
58	4	60	4.81	173	0.00
59	1	60	5.19	172	50.00
59	2	60	5.06	172	50.00
59	3	60	4.94	172	50.00
59	4	60	4.81	172	50.00
60	1	60	5.19	172	40.00
60	2	60	5.06	172	40.00
60	3	60	4.94	172	40.00
60	4	60	4.81	172	40.00
61	1	60	5.19	172	30.00
61	2	60	5.06	172	30.00
61	3	60	4.94	172	30.00
61	4	60	4.81	172	30.00
62	1	60	2.69	173	55.00
62	2	60	2.56	173	55.00
62	3	60	2.44	173	55.00
62	4	60	2.31	173	55.00
63	1	60	2.69	173	45.00
63	2	60	2.56	173	45.00
63	3	60	2.44	173	45.00
63	4	60	2.31	173	45.00
64	1	60	2.69	173	35.00
64	2	60	2.56	173	35.00
64	3	60	2.44	173	35.00

Appendix C.4.
(Page 6 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
64	4	60	2.31	173	35.00
65	1	60	2.69	173	25.00
65	2	60	2.56	173	25.00
65	3	60	2.44	173	25.00
65	4	60	2.31	173	25.00
66	1	60	2.69	173	15.00
66	2	60	2.56	173	15.00
66	3	60	2.44	173	15.00
66	4	60	2.31	173	15.00
67	1	60	2.69	173	5.00
67	2	60	2.56	173	5.00
67	3	60	2.44	173	5.00
67	4	60	2.31	173	5.00
68	1	60	2.69	172	55.00
68	2	60	2.56	172	55.00
68	3	60	2.44	172	55.00
68	4	60	2.31	172	55.00
69	1	60	2.69	172	45.00
69	2	60	2.56	172	45.00
69	3	60	2.44	172	45.00
69	4	60	2.31	172	45.00
70	1	60	2.69	172	35.00
70	2	60	2.56	172	35.00
70	3	60	2.44	172	35.00
70	4	60	2.31	172	35.00
71	1	60	2.69	172	25.00
71	2	60	2.56	172	25.00
71	3	60	2.44	172	25.00
71	4	60	2.31	172	25.00
72	1	60	2.69	172	15.00
72	2	60	2.56	172	15.00
72	3	60	2.44	172	15.00
72	4	60	2.31	172	15.00
73	1	60	2.69	172	5.00
73	2	60	2.56	172	5.00
73	3	60	2.44	172	5.00
73	4	60	2.31	172	5.00
74	1	59	57.69	173	55.00
74	2	59	57.56	173	55.00
74	3	59	57.44	173	55.00
74	4	59	57.31	173	55.00
75	1	59	57.69	173	45.00
75	2	59	57.56	173	45.00
75	3	59	57.44	173	45.00
75	4	59	57.31	173	45.00
76	1	59	57.69	173	35.00
76	2	59	57.56	173	35.00
76	3	59	57.44	173	35.00
76	4	59	57.31	173	35.00
77	1	59	57.69	173	25.00
77	2	59	57.56	173	25.00

Appendix C.4.
(Page 7 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
77	3	59	57.44	173	25.00
77	4	59	57.31	173	25.00
78	1	59	57.69	173	15.00
78	2	59	57.56	173	15.00
78	3	59	57.44	173	15.00
78	4	59	57.31	173	15.00
79	1	59	57.69	173	5.00
79	2	59	57.56	173	5.00
79	3	59	57.44	173	5.00
79	4	59	57.31	173	5.00
80	1	59	57.69	172	55.00
80	2	59	57.56	172	55.00
80	3	59	57.44	172	55.00
80	4	59	57.31	172	55.00
81	1	59	57.69	172	45.00
81	2	59	57.56	172	45.00
81	3	59	57.44	172	45.00
81	4	59	57.31	172	45.00
82	1	59	57.69	172	35.00
82	2	59	57.56	172	35.00
82	3	59	57.44	172	35.00
82	4	59	57.31	172	35.00
83	1	59	57.69	172	25.00
83	2	59	57.56	172	25.00
83	3	59	57.44	172	25.00
83	4	59	57.31	172	25.00
84	1	59	57.69	172	15.00
84	2	59	57.56	172	15.00
84	3	59	57.44	172	15.00
84	4	59	57.31	172	15.00
85	1	59	57.69	172	5.00
85	2	59	57.56	172	5.00
85	3	59	57.44	172	5.00
85	4	59	57.31	172	5.00
86	1	59	52.69	173	55.00
86	2	59	52.56	173	55.00
86	3	59	52.44	173	55.00
86	4	59	52.31	173	55.00
87	1	59	52.69	173	45.00
87	2	59	52.56	173	45.00
87	3	59	52.44	173	45.00
87	4	59	52.31	173	45.00
88	1	59	52.69	173	35.00
88	2	59	52.56	173	35.00
88	3	59	52.44	173	35.00
88	4	59	52.31	173	35.00
89	1	59	52.69	173	25.00
89	2	59	52.56	173	25.00
89	3	59	52.44	173	25.00
89	4	59	52.31	173	25.00
90	1	59	52.69	173	15.00

Appendix C.4.
(Page 8 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
90	2	59	52.56	173	15.00
90	3	59	52.44	173	15.00
90	4	59	52.31	173	15.00
91	1	59	52.69	173	5.00
91	2	59	52.56	173	5.00
91	3	59	52.44	173	5.00
91	4	59	52.31	173	5.00
92	1	59	52.69	172	55.00
92	2	59	52.56	172	55.00
92	3	59	52.44	172	55.00
92	4	59	52.31	172	55.00
93	1	59	52.69	172	45.00
93	2	59	52.56	172	45.00
93	3	59	52.44	172	45.00
93	4	59	52.31	172	45.00
94	1	59	52.69	172	35.00
94	2	59	52.56	172	35.00
94	3	59	52.44	172	35.00
94	4	59	52.31	172	35.00
95	1	59	52.69	172	25.00
95	2	59	52.56	172	25.00
95	3	59	52.44	172	25.00
95	4	59	52.31	172	25.00
96	1	59	52.69	172	15.00
96	2	59	52.56	172	15.00
96	3	59	52.44	172	15.00
96	4	59	52.31	172	15.00
97	1	59	52.69	172	5.00
97	2	59	52.56	172	5.00
97	3	59	52.44	172	5.00
97	4	59	52.31	172	5.00
98	1	59	47.69	173	55.00
98	2	59	47.56	173	55.00
98	3	59	47.44	173	55.00
98	4	59	47.31	173	55.00
99	1	59	47.69	173	45.00
99	2	59	47.56	173	45.00
99	3	59	47.44	173	45.00
99	4	59	47.31	173	45.00
100	1	59	47.69	173	35.00
100	2	59	47.56	173	35.00
100	3	59	47.44	173	35.00
100	4	59	47.31	173	35.00
101	1	59	47.69	173	25.00
101	2	59	47.56	173	25.00
101	3	59	47.44	173	25.00
101	4	59	47.31	173	25.00
102	1	59	47.69	173	15.00
102	2	59	47.56	173	15.00
102	3	59	47.44	173	15.00
102	4	59	47.31	173	15.00

Appendix C.4.
(Page 9 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
103	1	59	47.69	173	5.00
103	2	59	47.56	173	5.00
103	3	59	47.44	173	5.00
103	4	59	47.31	173	5.00
104	1	59	47.69	172	55.00
104	2	59	47.56	172	55.00
104	3	59	47.44	172	55.00
104	4	59	47.31	172	55.00
105	1	59	47.69	172	45.00
105	2	59	47.56	172	45.00
105	3	59	47.44	172	45.00
105	4	59	47.31	172	45.00
106	1	59	47.69	172	35.00
106	2	59	47.56	172	35.00
106	3	59	47.44	172	35.00
106	4	59	47.31	172	35.00
107	1	59	47.69	172	25.00
107	2	59	47.56	172	25.00
107	3	59	47.44	172	25.00
107	4	59	47.31	172	25.00
108	1	59	47.69	172	15.00
108	2	59	47.56	172	15.00
108	3	59	47.44	172	15.00
108	4	59	47.31	172	15.00
109	1	59	47.69	172	5.00
109	2	59	47.56	172	5.00
109	3	59	47.44	172	5.00
109	4	59	47.31	172	5.00
110	1	59	42.69	173	55.00
110	2	59	42.56	173	55.00
110	3	59	42.44	173	55.00
110	4	59	42.31	173	55.00
111	1	59	42.69	173	45.00
111	2	59	42.56	173	45.00
111	3	59	42.44	173	45.00
111	4	59	42.31	173	45.00
112	1	59	42.69	173	35.00
112	2	59	42.56	173	35.00
112	3	59	42.44	173	35.00
112	4	59	42.31	173	35.00
113	1	59	42.69	173	25.00
113	2	59	42.56	173	25.00
113	3	59	42.44	173	25.00
113	4	59	42.31	173	25.00
114	1	59	42.69	173	15.00
114	2	59	42.56	173	15.00
114	3	59	42.44	173	15.00
114	4	59	42.31	173	15.00
115	1	59	42.69	173	5.00
115	2	59	42.56	173	5.00
115	3	59	42.44	173	5.00

Appendix C.4.
(Page 10 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
115	4	59	42.31	173	5.00
116	1	59	42.69	172	55.00
116	2	59	42.56	172	55.00
116	3	59	42.44	172	55.00
116	4	59	42.31	172	55.00
117	1	59	42.69	172	45.00
117	2	59	42.56	172	45.00
117	3	59	42.44	172	45.00
117	4	59	42.31	172	45.00
118	1	59	42.69	172	35.00
118	2	59	42.56	172	35.00
118	3	59	42.44	172	35.00
118	4	59	42.31	172	35.00
119	1	59	42.69	172	25.00
119	2	59	42.56	172	25.00
119	3	59	42.44	172	25.00
119	4	59	42.31	172	25.00
120	1	59	42.69	172	15.00
120	2	59	42.56	172	15.00
120	3	59	42.44	172	15.00
120	4	59	42.31	172	15.00
121	1	59	42.69	172	5.00
121	2	59	42.56	172	5.00
121	3	59	42.44	172	5.00
121	4	59	42.31	172	5.00
122	1	59	37.69	173	55.00
122	2	59	37.56	173	55.00
122	3	59	37.44	173	55.00
122	4	59	37.31	173	55.00
123	1	59	37.69	173	45.00
123	2	59	37.56	173	45.00
123	3	59	37.44	173	45.00
123	4	59	37.31	173	45.00
124	1	59	37.69	173	35.00
124	2	59	37.56	173	35.00
124	3	59	37.44	173	35.00
124	4	59	37.31	173	35.00
125	1	59	37.69	173	25.00
125	2	59	37.56	173	25.00
125	3	59	37.44	173	25.00
125	4	59	37.31	173	25.00
126	1	59	37.69	173	15.00
126	2	59	37.56	173	15.00
126	3	59	37.44	173	15.00
126	4	59	37.31	173	15.00
127	1	59	37.69	173	5.00
127	2	59	37.56	173	5.00
127	3	59	37.44	173	5.00
127	4	59	37.31	173	5.00
128	1	59	37.69	172	55.00
128	2	59	37.56	172	55.00

Appendix C.4.
(Page 11 of 12) Pot setting locations within survey stations.

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
128	3	59	37.44	172	55.00
128	4	59	37.31	172	55.00
129	1	59	37.69	172	45.00
129	2	59	37.56	172	45.00
129	3	59	37.44	172	45.00
129	4	59	37.31	172	45.00
130	1	59	37.69	172	35.00
130	2	59	37.56	172	35.00
130	3	59	37.44	172	35.00
130	4	59	37.31	172	35.00
131	1	59	37.69	172	25.00
131	2	59	37.56	172	25.00
131	3	59	37.44	172	25.00
131	4	59	37.31	172	25.00
132	1	59	37.69	172	15.00
132	2	59	37.56	172	15.00
132	3	59	37.44	172	15.00
132	4	59	37.31	172	15.00
133	1	59	37.69	172	5.00
133	2	59	37.56	172	5.00
133	3	59	37.44	172	5.00
133	4	59	37.31	172	5.00
134	1	59	32.69	173	55.00
134	2	59	32.56	173	55.00
134	3	59	32.44	173	55.00
134	4	59	32.31	173	55.00
135	1	59	32.69	173	45.00
135	2	59	32.56	173	45.00
135	3	59	32.44	173	45.00
135	4	59	32.31	173	45.00
136	1	59	32.69	173	35.00
136	2	59	32.56	173	35.00
136	3	59	32.44	173	35.00
136	4	59	32.31	173	35.00
137	1	59	32.69	173	25.00
137	2	59	32.56	173	25.00
137	3	59	32.44	173	25.00
137	4	59	32.31	173	25.00
138	1	59	32.69	173	15.00
138	2	59	32.56	173	15.00
138	3	59	32.44	173	15.00
138	4	59	32.31	173	15.00
139	1	59	32.69	173	5.00
139	2	59	32.56	173	5.00
139	3	59	32.44	173	5.00
139	4	59	32.31	173	5.00
140	1	59	32.69	172	55.00
140	2	59	32.56	172	55.00
140	3	59	32.44	172	55.00
140	4	59	32.31	172	55.00
141	1	59	32.69	172	45.00

Appendix C.4.
(Page 12 of 12) **Pot setting locations within survey stations.**

Station	Pot in Station	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
141	2	59	32.56	172	45.00
141	3	59	32.44	172	45.00
141	4	59	32.31	172	45.00
142	1	59	32.69	172	35.00
142	2	59	32.56	172	35.00
142	3	59	32.44	172	35.00
142	4	59	32.31	172	35.00
143	1	59	32.69	172	25.00
143	2	59	32.56	172	25.00
143	3	59	32.44	172	25.00
143	4	59	32.31	172	25.00
144	1	59	32.69	172	15.00
144	2	59	32.56	172	15.00
144	3	59	32.44	172	15.00
144	4	59	32.31	172	15.00
145	1	59	32.69	172	5.00
145	2	59	32.56	172	5.00
145	3	59	32.44	172	5.00
145	4	59	32.31	172	5.00

Appendix C.5. "Blocking" of survey stations for itinerary to cover 143 stations in 17 days. "Day 1" is first day of arrival on survey area.

Block	Number of Stations		Stations in Block	Day Set	Day Pick
1	9[1]		83-85, 95-97, 107-109	1	2
2	9[2]		35-37, 53-55, 71-73	2	3
3	9[3]		34, 42-43, 51-52, 60-61, 69-70	3	4
4	9[1]		80-82, 92-94, 104-106	4	5
5 (5a, 5b)	10[3]	5a:5	33, 41, 50, 59, 68	5	6
		5b:5	32, 40, 49, 58, 67		
6	7[3]		11, 13-14, 20-21, 25-26	6	7
7 (7a, 7b)	10[3]	7a:5	31, 39, 48, 57, 66	7	8
		7b:5	30, 38, 47, 56, 65		
8	8[4]		1, 9-10, 12, 18-19, 24	8	9
9	9[1]		1-3, 6-7, 15-17	9	10
10	9[1]		27-29, 44-46, 62-64	10	11
11	9[1]		74-76, 86-88, 98-100	11	12
12	9[1]		77-79, 89-91, 101-103	12	13
13	9[1]		110-112, 122-124, 134-136	13	14
14	9[1]		113-115, 125-127, 137-139	14	15
15	9[1]		116-118, 128-130, 140-142	15	16
16	9[1]		119-121, 131-133, 143-145	16	17

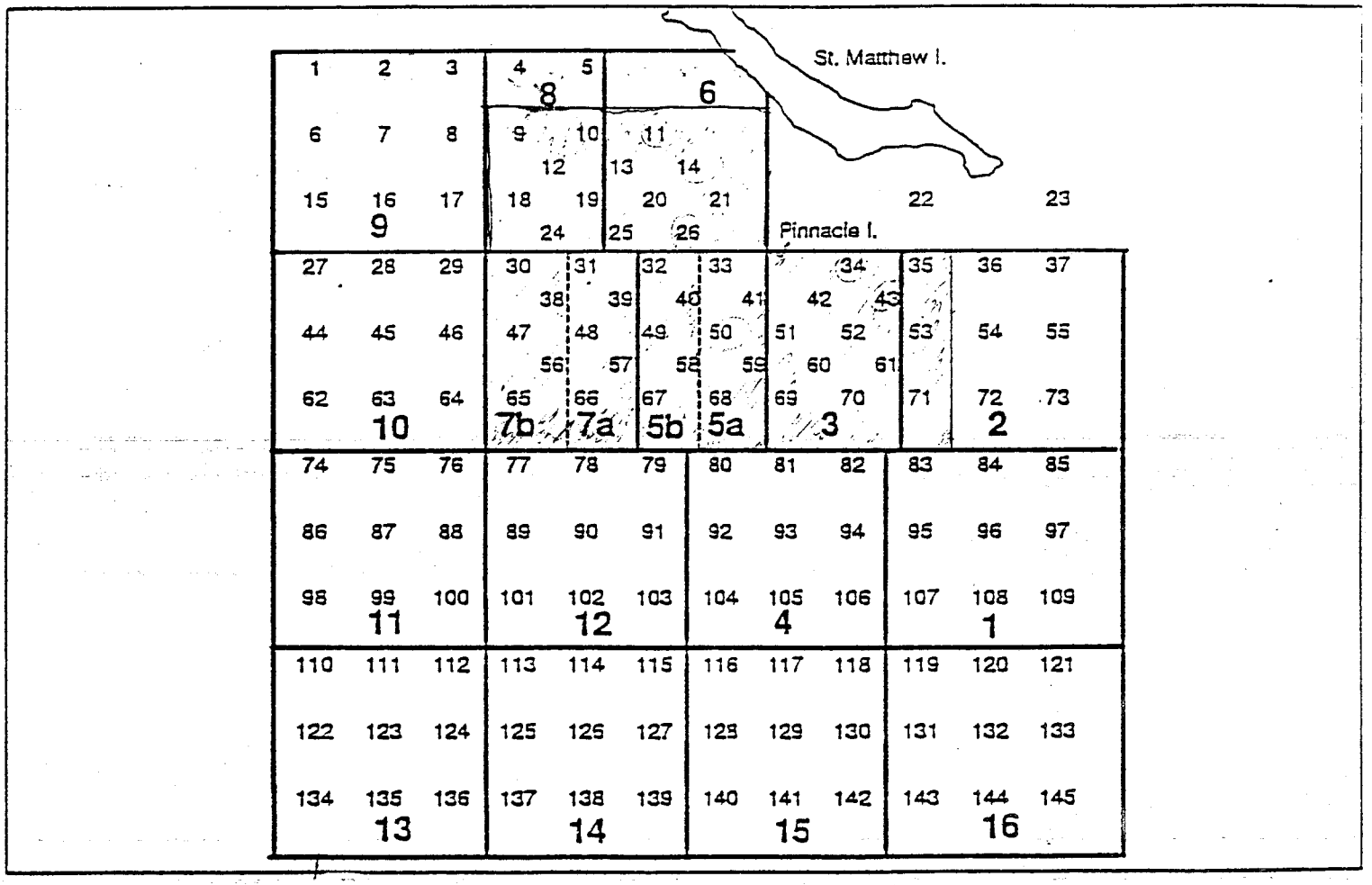
[1] All in Stratum 1

[2] 6 in Stratum 1, 3 in Stratum 2.

[3] All in Stratum 2

[4] 2 in Stratum 1, 6 in Stratum 2

Appendix C.6. Station blocks for 1995 St. Matthew blue king crab survey. Note that Blocks 5 and 7 are subdivided into sub-blocks 5a and 5b and 7a and 7b, repsectively. Optional stations 22 and 23 are not included in any block.



Appendix C.7. Survey itinerary by station blocks for St. Matthew blue king crab pot survey. "Day 1" is first day of arrival in survey area.

Time:	0:00-6:00	6:00-18:00	18:00-24:00
Day 1	Set Block 1	To Block 2	
Day 2	Set Block 2	To & Pick Block 1	To Block 3
Day 3	Set Block 3	To & Pick Block 2	To Block 4
Day 4	Set Block 4	To & Pick Block 3	To Block 5
Day 5	Set Block 5	To & Pick Block 4	To Block 6
Day 6	Set Block 6	To & Pick Block 5	To Block 7
Day 7	Set Block 7	To & Pick Block 6	To Block 8
Day 8	Set Block 8	To & Pick Block 7	To Block 9
Day 9	Set Block 9	To & Pick Block 8	To Block 10
Day 10	Set Block 10	To & Pick Block 9	To Block 11
Day 11	Set Block 11	To & Pick Block 10	To Block 12
Day 12	Set Block 12	To & Pick Block 11	To Block 13
Day 13	Set Block 13	To & Pick Block 12	To Block 14
Day 14	Set Block 14	To & Pick Block 13	To Block 15
Day 15	Set Block 15	To & Pick Block 14	To Block 16
Day 16	Set Block 16	To & Pick Block 15	To Block 16
Day 17		Pick Block 16	Off to Prib's

Appendix C.8. Summary of tagging strategies for stations.

Stations	Legal Males		Mature females
	Floy tag	PIT tag	Floy tag
1-8	all, up to 40	none	none
9-14	1/2, up to 60	1/2, up to 60	all, up to 25
15-17	all, up to 40	none	none
18-21	1/2, up to 60	1/2, up to 60	all, up to 25
22-23	all, up to 40	none	none
24-26	1/2, up to 60	1/2, up to 60	all, up to 25
27-29	all, up to 40	none	none
30-35	1/2, up to 60	1/2, up to 60	all, up to 25
36-37	all, up to 40	none	none
38-43	1/2, up to 60	1/2, up to 60	all, up to 25
44-46	all, up to 40	none	none
47-53	1/2, up to 60	1/2, up to 60	all, up to 25
54-55	all, up to 40	none	none
56-61	1/2, up to 60	1/2, up to 60	all, up to 25
62-64	all, up to 40	none	none
65-71	1/2, up to 60	1/2, up to 60	all, up to 25
72-145	all, up to 40	none	none

Appendix C.9. Priority ranking of survey stations, ordered from highest to lowest. "Essential" stations must be completed to minimally achieve survey objectives. Priority 4 stations are the first stations to omit to meet vessel charter time constraints; Priority 1 stations are the last stations to omit to meet vessel charter time constraints.

Priority	Block	Stations	N. Latitude Range	W. Longitude Range
Essential	1-12	1-21, 24-109	59°47.50'-60°27.50'	172°5.00'-173°55.00'
1	13	110-112, 122-124, 134-136	59°32.50'-59°42.50'	173°35.00'-173°55.00'
2	14	113-115, 125-127, 137-139	59°32.50'-59°42.50'	173°5.00'-173°25.00'
3	15	116-118, 128-130, 140-142	59°32.50'-59°42.50'	172°35.00'-172°55.00'
4	16	119-121, 131-133, 143-145	59°32.50'-59°42.50'	172°5.00'-172°25.00'

APPENDIX D: 1995 ST. MATTHEW BLUE KING CRAB SURVEY AND TAG RECOVERY FORMS

ADF&G PILOT HOUSE LOG - 1995 ST. MATTHEW BLUE KING CRAB SURVEY

CAPTAIN: **VESSEL: FV** **PAGE ___ OF ___**

STATION	SET GEAR			DEPTH	BOT-	SEQUENTIAL	BOUY	LIFT GEAR			N LATITUDE		W LONGITUDE	
	MONTH	DAY	MILITARY TIME	FATHOMS	TOM	POT NUMBER	NO.	MONTH	DAY	MILITARY TIME	DEGREE	MINUTES	DEGREES	MINUTES
												.		.
												.		.
												.		.
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STATION												.		.
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STATION												.		.
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STATION												.		.
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												.		.

* BOTTOM TYPE CODES: 1 - Rock 2 - Sand 3 - Silt 4 - Mud

SM4LOG95.WQ1

ADF&G MALE BLUE KING CRAB - 1995 ST. MATTHEW POT SURVEY

Appendix D.2.

VESSEL _____

DATE | | | | | | |

STRATUM | |

STATION NUMBER | | | |

BUOY NUMBER NUMBER | | | |

NO. CRAB MEASURED | | | |

TOTAL NO. CAUGHT | | | | |

TAGGER _____

MEASURER _____

RECORDER _____

PAGE _____ OF _____

	SEQUENTIAL POT NUMBER	SPECIES	SEX	SIZE (mm-CL)	LEGAL	SHELL AGE	PIT TAG				FLOY TAG		OTHER	COMMENTS
							CARTRIDGE NO.	TAG READER	SAVED LOT NO.	PIT TAG ID NO. (last four digits)	SERIES	TAG NO.		
1		3	1								A			
2		3	1								A			
3		3	1								A			
4		3	1								A			
5		3	1								A			
6		3	1								A			
7		3	1								A			
8		3	1								A			
9		3	1								A			
10		3	1								A			
11		3	1								A			
12		3	1								A			
13		3	1								A			
14		3	1								A			
15		3	1								A			
16		3	1								A			
17		3	1								A			
18		3	1								A			
19		3	1								A			
20		3	1								A			
21		3	1								A			
22		3	1								A			
23		3	1								A			
24		3	1								A			
25		3	1								A			
26		3	1								A			
27		3	1								A			
28		3	1								A			
29		3	1								A			
30		3	1								A			

STRATUM

1 - Low Density
2 - High Density

LEGAL

1 - Sublegal <5 1.2" CW
2 - Legal ≥ 5 1/2" CW

SHELL AGE

0 - Soft
1 - New
2 - Old
3 - Very Old

OTHER

1 - Dead
2 - Alive
3 - Nemerteans in clutch
4 - Turbellarians in clutch
5 - Black mat
6 - Bitter crab disease
7 - "cottage cheese disease
8 - Shell rust
9 - B. callosus

FILE: MALEbkc 7/95

ADF&G FEMALE BLUE KING CRAB - 1995 ST. MATTHEW POT SURVEY

Appendix D.3.

VESSEL _____

DATE | | | | | | |

STRATUM | |

STATION NUMBER | | |

BUOY NUMBER | | |

NO. CRAB MEASURED | | |

TOTAL NO. CAUGHT | | | |

MEASURER _____

RECORDER _____

PAGE _____ OF _____

	SEQUENTIAL POT NUMBER	SPECIES	SEX	SIZE (mm-CL)	SHELL AGE	EGGS: COLOR	EGGS: DEVELOP	EGGS: CONDITION	EGGS: % CLUTCH	OTHER	SERIES	TAG NO.	COMMENTS
1		3	2								A		
2		3	2								A		
3		3	2								A		
4		3	2								A		
5		3	2								A		
6		3	2								A		
7		3	2								A		
8		3	2								A		
9		3	2								A		
10		3	2								A		
11		3	2								A		
12		3	2								A		
13		3	2								A		
14		3	2								A		
15		3	2								A		
16		3	2								A		
17		3	2								A		
18		3	2								A		
19		3	2								A		
20		3	2								A		
21		3	2								A		
22		3	2								A		
23		3	2								A		
24		3	2								A		
25		3	2								A		

SHELL AGE

0 - Soft
1 - New
2 - Old
3 - Very Old

STRATUM

1 - Low Density
2 - High Density

LIVE EGG COLOR

1 - Tan
2 - Purple
3 - Brown
4 - Orange
5 - Purple-brown
6 - Pink
7 - Reddish
8 -
9 -
0 - Other, describe in comments

EGG DEVEL.

1 - Uneyed
2 - Eyed

CLUTCH COND.

1 - Dead eggs not apparent
2 - Dead eggs <20%
3 - Dead eggs >20%

PERCENT CLUTCH

1 - Barren, clean pleopods
2 - Barren, with empty egg cases and/or stalks
3 - Clutch 1-29% full
4 - Clutch 30-59% full
5 - Clutch 60-89% full
6 - Clutch 90-100% full

OTHER

1 - Dead
2 - Alive
3 - Nemerteans in clutch
4 - Turbellarians in clutch
5 - Black mat
6 - Bitter crab disease
7 - "cottage cheese" disease
8 - Shell rust
9 - B. callosus

FILE: FEMBKC. 7/95

ADF&G CRAB RESEARCH DATA FORM

SPECIES _____

SEX _____

DATE [ ] [+] [+] [ ]

STRATUM OR SAMPLE TYPE [ ]

STATION NO. [ ] [ ] [ ]

BUOY NO. [ ] [ ] [ ]

NO. CRAB MEASURED [ ] [ ] [ ]

TOTAL NO. CAUGHT [ ] [ ] [ ] [ ]

VESSEL _____

MEASURER _____

RECORDER _____

PAGE _____ OF _____

	SEQUENTIAL POT NUMBER	SPECIES	SEX	SIZE (MM) (CM) CRABS FISH	LEGAL	SHELL AGE	EGGS COLOR	EGGS DEVELOPMENT	EGGS CONDITION	EGGS % CLUTCH	OTHER	COMMENTS
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

Crab Species
1 - L. aequispina
2 - P. camtschaticus
3 - P. platypus
4 - Erimacrus
5 - C. bairdi x opilio
6 - C. bairdi
7 - C. opilio
8 - C. angulatus
9 - Cancer magister
10 - L. couesi
11 - C. tanneri

Fish & Invert. Species
See coded species list

Sex
1 - Male
2 - Female

Legal
1 - Sublegal
2 - Legal

Shell Age
0 - Soft
1 - New
2 - Old
3 - Very Old

Live Egg Color
1 - Tan
2 - Purple
3 - Brown
4 - Orange
5 - Purple-brown
6 - Pink
7 - Reddish
8 -
9 -
0 - Other, describe in comments

Egg Development
1 - Uneyed
2 - Eyed

Clutch Condition
1 - Dead eggs not apparent
2 - Dead eggs < 20%
3 - Dead eggs > 20%

Percent Clutch
1 - Barren, clean pleopods
2 - Barren, with empty eggs cases and/or stalks
3 - Clutch 1-29% full
4 - Clutch 30-59% full
5 - Clutch 60-89% full
6 - Clutch 90-100% full

Others
1 - Dead
2 - Alive
3 - Nemerteans in clutch
4 - Turbellarians in clutch
5 - Black mat
6 - Bitter crab disease
7 - "cottage cheese" disease
8 - Shell rust
9 - B. callosus

Stratum
1 - Low Density
2 - High Density

Sample Type
3 - 3" Tunnel
5 - 5" Tunnel

FILE: CRABFORM 7/95

ADF&G 1995 ST. MATTHEW BLUE KING CRAB SURVEY TAGGING RECORD

Date	Stratum	Station	PIT Males	Floy Tagged Crabs		Cumulative		
				Male	Female	PIT Males	Floy Males	Floy Females

ADF&G ST. MATTHEW BLUE KING CRAB SURVEY OBSERVER PRACTICUM COLLECTION RECORD

Date	Blue King Crab		Red King Crab		C. Bairdi		C. Opilio		Korean Hair Crab		Tanner Hybrids
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	

Collection Goals: blue king crab - 10 males, 5 females; red king crab - 10 males, 5 females; C. bairdi - 25 males, 10 females; C. opilio - 200 males, 25 females; Korean hair crab - 10 males, 5 females; Tanner hybrids - anything available up to 35 crabs.
** Collect new shell, old shell, gravid and barren crabs if possible.

Appendix E. PASSIVE INTEGRATED TRANSPONDER (PIT) TAG PROTOCOLS FOR HAND-HELD READER AND COMPUTER INTERFACE

SETTING UP THE READER/COMPUTER INTERFACE AND RELATED EQUIPMENT

Each user should read all pertinent manuals and instructions thoroughly before operation of associated equipment. The Trovan reader manual (Appendix E.1) is particularly vital as it specifies reader operation, settings, power requirements and other information regarding proper use. Sections referenced in the pages that follow have been highlighted to focus on specific areas that are relevant to the project.

Equipment List for Reader/Computer Interface

The essential equipment needed at-sea is listed below:

1. One (1) AST Premium Exec 386SX/SO lap top computer
2. Two (2) three-way cord that connects the computer and the hand-held reader and the power source
3. One (1) spare 9-pin RS-232 cable that connects reader to computer
4. Three (3) Trovan hand held readers. Readers A and B are designated for on-deck use only. Reader C is designated for inside use only, in the event that additional PIT tags must be re-loaded.
5. Two (2) reader battery chargers
6. One Canon ASF-6410 Bubble Jet Printer with sheet feeder, adaptor AD-50 power hook-up, and 8-bit parallel interface cable to connect printer to computer
7. One package of hard disks (3M DS, HD 1.44 Mb/1.44 Mo)
8. One spare Bubble Jet Printer ink cartridge
9. Bubble Jet printer (BJ-10e) user's manual
10. Trovan reader user's manual
11. Laplink III user's manual
12. Buss bar (surge protector): NOTE: Plug all computer, reader, printer equipment into the Buss bar, NOT the direct shipboard outlet.
13. Small screwdriver

Connecting the Computer, Printer, and Trovan Reader

Connect the computer to the AC power source as shown in Appendix E.2.

Connecting the Trovan Reader to the Computer

Connect a three-way (computer-reader-AC power) 9-pin RS-232 cable from Comm Port 1 of the Premium Exec 386SX computer to the Trovan RS-232 connector (Appendix E.2). Always connect the computer and the hand wand to the AC power source to prevent batteries from draining. If batteries drain, data will be lost.

-Continued-

Connecting the Canon Bubblejet Printer (BJ-10e) to the Power Source and to the Computer

Use the Canon AC adapter (AD-150) to connect the printer to the power source. To connect the printer to the computer, attach one end of the 8-bit parallel interface cable to the interface connection on the right side of the printer and engage the lock pins. Attach the other end of the interface cable to the parallel interface connector on the computer. Diagrams of these connections are shown in Appendix E.2.

TRANSFERRING PIT TAG DATA FROM THE READER TO THE COMPUTER

The data will be saved to the 'GWBASIC' program that is loaded on the C drive of the computer. All data is saved to the C drive and backed up by copying each data file to a diskette. However, when tag cartridges are being loaded, the GWBASIC program on diskette (A drive) is used and all cartridge loading data will be saved to diskette (A drive).

Begin each day by making sure the reader being used is fully charged, and is on SAVE yes, SEEK no modes. Also, make sure the lot number is changed each day (day 1 starts on Lot #1, day 2 Lot #2, etc.). NOTE: Lot 01 is not the same as Lot 1.

To view/change the reader settings:

1. Hook the Trovan reader up to the computer and load the GWBASIC program as follows:

   a. Load GWBASIC from the C prompt by typing **TAG <enter>**.
   b. Press **F3** ('load' will be displayed).
   c. Type **DEM22",R** ('load dem22",R' will be displayed). Note: the R following the comma initiates the operation of the software.
   d. Press <enter>

2. Assuming you are connected to the communications port of the PC, when asked: "Which COM port do you wish to use?", type **1.**
3. The SELECT FUNCTIONS within DEM22 will appear as shown below:

   F1->View/change reader settings
   F2->Move readings from reader to disk
   F3->Move readings from disk to reader (not used on the survey)
   F4->View/change reader contents
   F5->View/change disk contents
   F6->Remote read transponders (not used on the survey)
   F7->Exit

-Continued-

4. To view/change reader settings, select F1. The following information will appear:

Date: 8/1/95	Software version 2.1
Time: 12:04	Batt volt 12.2v
Save mode: yes	Readings saved 0
Seek mode: no	Free memory 3160 (total)
Lot #: 1	
Key lot #: 0	

Press <enter> to toggle from date to time, etc.

Conduct PIT tagging as described in *Tagging Procedures* of this operational plan. Following each PIT tag injection the tagged crab will be scanned to verify proper functioning of the tag and to store the tag number, and date and time of tagging. There are two lights on the hand-held reader; these lights should be monitored during scanning.

1. When the trigger is pulled to read a tag, the red light will flash and a readout should appear in the LCD:

e.g. Reading #12

W	7/20/95	14:08
(day)	(date)	(time)

2. Once the tag is read, the green light will flash and the following message will appear:

e.g. ID# 00-001C-42EC (PIT tag number)
Lot#4 Saved

NOTE: It may take several passes of the hand-held reader to detect and store the PIT tag number.

Daily downloading of injected PIT tags by lot number is the first step in creating an electronically-gathered tagging record. Data will be downloaded at the end of each tagging day. Downloading involves three steps: reader/computer setup, transfer of tagging records from the reader to the computer and copying records from the computer hard drive to a diskette.

1. To download PIT tag data from the reader to the computer, set up the reader and computer.

   a. Load GWBASIC at the A prompt by typing GWBASIC <enter>.
   b. Press <F3> (load will be displayed).
   c. Type DEM22",R (load "dem22",R will be displayed).
   d. Press <enter> and choose Port '1'

-Continued-

2. When the SELECT FUNCTIONS appear, choose F4 (view/change reader contents) and choose F2 (display readings on screen):

F4-> View/change reader contents
F1-display map of readings
F2-display readings on screen
F3-Print readings
F4-Clear readings

3. To move PIT tag readings from the reader to a diskette, escape (ESC) back to main SELECT FUNCTION menu and press **F2** (move readings from reader to disk). Remember that all downloaded data is saved to the hard drive (C) even though it says "move readings from reader to disk".

a. Enter the lot number you wish to load: e.g. 1
b. Enter the disk file name : eg. lot1a.dat
You must type a new lot number and letter over whatever is there. Type letter A or B after the lot# to designate the reader used during tagging.
c. At the bottom of the computer screen a message will appear telling you the number of records saved to each filename (e.g., 14 records saved to file lot1a.dat).

4. Once data has been transferred from reader to disk you are ready to look at data by lot number, print a hard copy of lot numbers and finally, create a text file.

a. Press **F5** at the main selection menu (view/change disk contents and choose **F3** (display disk file contents). The purpose here is to look at the file in question (e.g., lot1a) to make sure it has been transferred.

b. Press **F4** to print the file. NOTE: This is the hard copy record of the tagging data by lot number.

c. Press **F5** to generate data text file. Generate a data text file (.txt) for each data file (e.g., lot1a.dat->lot1a.txt).

F1-Display disk file directory.
F2-Delete a disk file.
F3-Display disk file contents. Enter the lot# and reader letter.
F4-Print disk file contents.
F5-Generate data text file. Enter source disk file name (e.g., lot1a.dat). The text file will have the same name with a .txt extension. Text files will be imported into Lotus 123 at the office.

-Continued-

A sample data file output in Appendix E.3. It has been marked with the disk file name (lot1a.dat) and the text file name (lot1a.txt). The .dat and .txt file names need to be written on each printout. The data file information is also noted on the Male Blue King Crab Data Form as shown in Appendix E.4.

To make a back-up copy of the file that was saved, exit the GWBASIC program and save the .dat and .txt files. To exit the reader-computer interface and return to the A prompt, press **F7** at the main menu. To copy files, make sure you are on the directory C:\GWBASIC and type COPY LOT1.* A: at the C prompt. Switch to the A drive and check to make sure both .dat and .txt files have been copied.

Data from each tagging day will be assigned a unique lot number. The first tagging day the reader will be set to LOT#1, the second tagging day will be LOT#2, and so forth. At the end of each tagging day, all tag numbers for that day will be saved to a single, unique lot number on the hard drive, a single diskette (for each day only), and a hard copy file generated from the printer.

PREVENTING PROBLEMS ON A DAILY BASIS

1. Cross-check the reader letter (A or B) so that the crab tagging form corresponds to the proper hard copy tagging record.

2. Make sure each reader is set on **SAVE** mode. Begin each day with a new lot number on the reader(s).

3. Down load the reader(s) at the end of each day. Save each lot number as a text file (e.g., lot1a.txt, lot2a.txt, etc.).

4. Print each lot number from each reader each day and cross-check with on-deck data forms. Note any discrepancies between the computer record and the on-deck record, especially if the last four digits of the PIT tag number does not match.

LOADING CARTRIDGES AT SEA

The numbering system is sequential and unique beginning with number one (1). There are 208 cartridges pre-loaded with 24 tags each. After all pre-loaded cartridges have been used, the cartridges will be reloaded. Cartridges that are loaded at sea will be re-numbered sequentially beginning after the last pre-loaded cartridge number has been used. Sequential use of cartridges facilitates data orderliness; however, if a cartridge is used out-of-sequence, just record the cartridge number.

-Continued-

Load cartridges when the reader has been attached to the power source and the computer, and the computer attached to the printer. Cartridges are scanned to create archive files of the PIT tag numbers prior to tagging. Tag number, and date and time data will be saved for each loaded cartridge on disk and a printout will be made of each archive file.

1. If you are already in the GWBASIC program on the C drive, you must exit and insert the disk containing the GWBASIC program. Load GWBASIC from the A prompt by typing A:\GWBASIC <enter>.

   a. Press **F3** ('load' will be displayed).
   b. Type **DEM22",R** ('load DEM22",R' will be displayed) and press <enter>.
   c. Type **1** for comm port to use.
   d. Under SELECT FUNCTIONS, choose **F1->**View/change reader settings. Make sure that the correct date and time are set, that the reader is set to **SAVE-yes; SEEK-no,** and that the lot number is changed every day and corresponds to the cartridge number (cartridge 51=lot 51, cartridge 52=lot 52, etc.). Use the <enter> key to toggle from date to time, etc.).

2. Take an empty cartridge and change the number on it to the next consecutive number. If the last pre-loaded cartridge was 50, the first one loaded will be 51.

3. Scan loose tags one at a time and insert into top of cartridge starting at the number one slot. Push the tags down into the cartridge gently with another tag to prevent them from falling out. Load 24 tags into each cartridge.

4. During scanning, the LCD window will display the sequential tag number (1-24), and the day, date and time. Once the tag is accepted, the light on the back of the reader will change from red to green and the reader will say '-SAVED' and the PIT tag number will be displayed.

5. When the cartridge is full, <ESC> back to main menu:

   a. Press **F2->Move readings from reader to disk.** Type in the lot (cartridge) number to be moved from the reader to the disk and then press <enter>.
   b. Type in the disk file name by entering the cartridge number and arc (e.g., 51arc) over whatever is already there (eg. lot 13) and press <enter>. The .dat extension is already attached to the filename.

6. To make sure that the cartridge data has been transferred:

   Press **F5->View/change disk contents** and select **F3**. Enter the disk file name (e.g., 51arc). At the bottom of the screen, '24 readings present in disk file 51arc.dat' will be displayed.

-Continued-

7. To print the data from each loaded cartridge:

   Press **F5->View/change disk contents** and select **F4**. Enter the disk file name (e.g., 51arc). Make sure that the printer is on line or it won't print. To remove paper from the printer, take printer off-line, then push and hold LF/FF and paper will come out.

8. To generate a text file of each loaded cartridge:

   Press **F5->View/change disk contents** and select **F5**. Enter the disk file name (e.g., 51arc). A .txt extension will be attached to the file. At the bottom of the screen, '24 records written to 51arc.txt' will be displayed.

On the upper right hand corner of the paper copy, record the disk and the text file named (e.g., 51arc.dat and 51arc.txt).

9. Before loading the next cartridge, <esc> back the main menu and press **F1->**View/change reader settings. The lot number must be changed to correspond with the next cartridge number to be loaded (e.g., cartridge 52=lot 52, etc.).

Reminder: During tagging, all data is saved to the hard drive because GWBASIC runs off the hard drive (C) and is then backed-up on a diskette. During cartridge loading, all data is saved to a diskette on the A drive (GWBASIC runs off a diskette).

SHORT INSTRUCTIONS FOR CHANGING SETTINGS, DOWNLOADING DATA, AND CREATING AND COPYING FILES

Protocols During Tagging

Changing Reader Settings

Reader settings must be changed every tagging day. Hook up the reader and computer. Load GWBASIC from the C prompt by typing:
TAG <enter>.

1. Press **F3** ('load' will be displayed).
2. Type **DEM22",R** ('load DEM22",R' will be displayed) and press <enter>.
3. Type **1** for comm port to use.
4. Under SELECT FUNCTIONS, choose **F1->**View/change reader settings. Make sure the correct date and time have been set, that the reader is set to **SAVE-yes; SEEK-no,** and that the lot number is changed every day and corresponds to the tagging day (tagging day 1=lot 1, tagging day 2=lot 2, etc.). Use the <enter> key to toggle from date to time, etc.

-Continued-

The reader is now configured for the current tagging day. Tag crabs as instructed (appendix x.?). At the end of the tagging day, proceed through the following sections.

Moving Tag Readings From Reader to Disk

At the main menu, press **F2->**Move readings from reader to disk. Enter the lot number to move. Enter the disk filename (lot#, with reader letter A or B).

Printing and Generating Text Files

At the main menu, press **F5->**View/change disk contents.

1. Press **F4->**Print disk file contents.
2. Press **F5->**Generate data text file by entering source disk filename.

To exit the GWBASIC program, press **F7.**

Copying Files to Disk

At C:\GWBASIC>, type: COPY lot#/reader#.* A:

Protocols When Loading Cartridges

Changing Reader Settings

Reader settings must be changed each time a cartridge is loaded. Lot number and cartridge number will correspond, e.g.,
cartridge 41 = lot 41. Hook up the reader and computer. Load GWBASIC from the A prompt by typing A:\GWBASIC <enter>.

1. Press **F3** ('load' will be displayed).
2. Type **DEM22",R** ('load DEM22",R' will be displayed) and press <enter>.
3. Type **1** for comm port to use.
4. Under SELECT FUNCTIONS, choose **F1->**View/change reader settings. Make sure that the correct date and time are set, that the reader is set to **SAVE-yes; SEEK-no,** and that the lot number is changed every day and corresponds to the cartridge number (cartridge 41=lot 41, cartridge 42=lot 42, etc.). Use the <enter> key to toggle from date to time, etc.

The reader is now configured for loading cartridges as previously instructed. When you are done loading cartridges, proceed through the following sections.

-Continued-

Moving Tag Readings From Reader to Disk

At the main menu, press **F2**->Move readings from reader to disk. Enter the lot number to move. Enter the disk filename (e.g., A:\41arc).

Printing and Generating Text Files

At the main menu, press **F5**->View/change disk contents.

1. Press **F4**->Print disk file contents (e.g., 41arc).
2. Press **F5**->Generate data text file by entering source disk filename (e.g., A:\41arc.txt).

To exit the GWBASIC program, press **F7.**

EQUIPMENT MAINTENANCE

The Ralgo gun (used to inject the PIT tag into the crab) will be rinsed with fresh water, dried thoroughly, and sprayed with WD-40 each day. WD-40 should be sprayed into the trigger mechanism and the cartridge area and then wiped off.

The Trovan readers are only water-resistant and must be kept as dry as possible. After each use on deck, bring the readers inside and wipe them off with a dry cloth. If a reader gets wet and begins to malfunction, place it in a secure, warm, dry area (e.g., the engine room) until it has dried thoroughly. **Do not** take the reader apart to dry or clean it unless it is mandatory (e.g, there are no working readers on the vessel). The readers are very fragile and should be kept inside the vessel when not in use.

Each reader must be hooked up to the battery charger each night. If the reader ever flashes the LOW BATTERY sign immediately stop using it and hook it up to the battery charger. If the battery dies on the Trovan reader all data stored can be lost.

Appendix E.1.

TROVAN

READER MANUAL

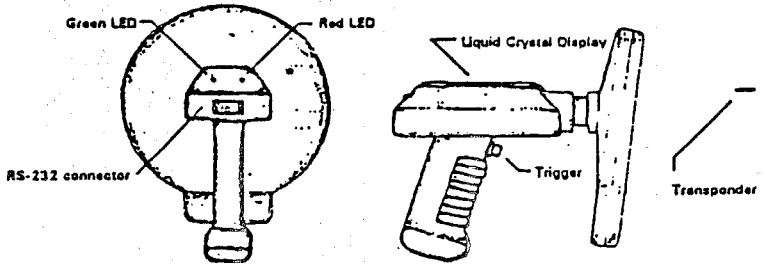
1. Description of Operation

1.1 System Overview

The Trovan identification system consists of a reader and a multiplicity of transponders. Using a magnetic field, the reader transmits to a remotely located transponder, and reads the unique identification code ("ID Number") permanently programmed into the transponder. Since the transponders are completely powered by the reader, they are maintenance-free and require no batteries. Each transponder is pre-programmed at the factory with one of 550 billion unalterable, unique ID-Numbers. This approach results in a tamper-proof system suited to a broad variety of identification applications.

The reader is capable of several modes of operation. These modes allow the operator to store readings in the internal non-volatile memory, as well as compare the ID number with others previously stored. This comparison feature provides a means to signal the operator when one or more desired transponders have been located within a larger group. As an added feature, the weekday, date and time at the instant of reading are stored along with the ID number in the reader memory.

The reader is actuated simply by depressing the single push-button "trigger" located on the handle. The reader is capable of communicating with an external host computer through an RS-232 data port located at the rear of the reading housing. This port allows the external computer to transfer ID numbers to and from the reader, as well as remotely control many facets of reader operation. In addition, the reader may be completely reprogrammed through this port, allowing reader software upgrades to be installed in the field.



The reader contains an internal rechargeable Nickel-Cadmium battery pack, which will provide enough power to perform approximately one thousand readings. The batteries may be fully charged in about 16 hours through the RS-232 connector with the battery charger provided. When an attempt is made to read a transponder, the reader will continuously emit power pulses until the trigger is released or the transponder is successfully read. The ID number is displayed on the reader's Liquid Cristal Display (LCD) for a short period of time after the trigger is released. The reader then automatically shuts off ist power to extend battery life. To maximize battery life, the trigger should only be depressed while attempting to read transponders.

1.2 Reader Operating Modes

To fully understand the types of reader operation, the concept of a LOT is introduced. Whenever an ID number is stored in reader memory, a user-programmable LOT number (along with the weekday, date and time) is stored along with it. This LOT number is really a tag which allows the operator to label stored ID numbers in a particular reading session. LOT#1 through LOT#15 may be selected by the operator with the hand reader. LOT#1 through LOT#255 are available if an external computer is used to select the current LOT number. As an example, say the operator has green components and red components. He could store the ID numbers of the green components in LOT#3 and the ID numbers of the red components in LOT#6. The operator can later easily seperate the two groups of readings. A total of 3160 readings can be stored in the reader's internal memory.

The types of reader operation are defined by two modes, SEEK mode and SAVE mode. SAVE directs the reader to store the ID numbers in the memory. SEEK directs the reader to compare the ID numbers being read to those previously stored in any other LOT.

The SAVE and SEEK modes define four different types of reader operation.

SAVE = NO : SEEK = NO
During this type of operation, the reader merely displays the ID number. The ID numbers are not stored in the reader memory.

SAVE = YES : SEEK = NO
During this type of operation, the reader displays the ID number, and stores it along with the current LOT#, weekday, date and time in the reader memory. If the ID number is already present in that LOT, the reading is not stored, and the operator is notified that a duplicate reading has occurred. The operator is prompted to select a LOT# when entering the SAVE mode.

SAVE = NO : SEEK = YES
During this type of operation , the reader compares the ID number with all of the ID numbers previously stored in a LOT. This LOT is called the KEYLOT. If the ID number matches any of the ID numbers in KEYLOT, the display indicates a match. The operator is prompted to select the KEYLOT# when entering the SEEK mode.

As an example, say a colourblind operator has green components and red components. Using SAVE = YES and SEEK = NO and LOT# = 3, he stores the ID numbers of the green components in LOT#3. Somebody then mixes up the green components and the red components, and it his job to seperate them. If the operator sets SAVE = NO and SEEK = YES and KEYLOT = 3, the reader will indicate whenever the ID number of the unknown component matches any ID number stored in LOT#3, the KEYLOT. The ID numbers which match will be green components.

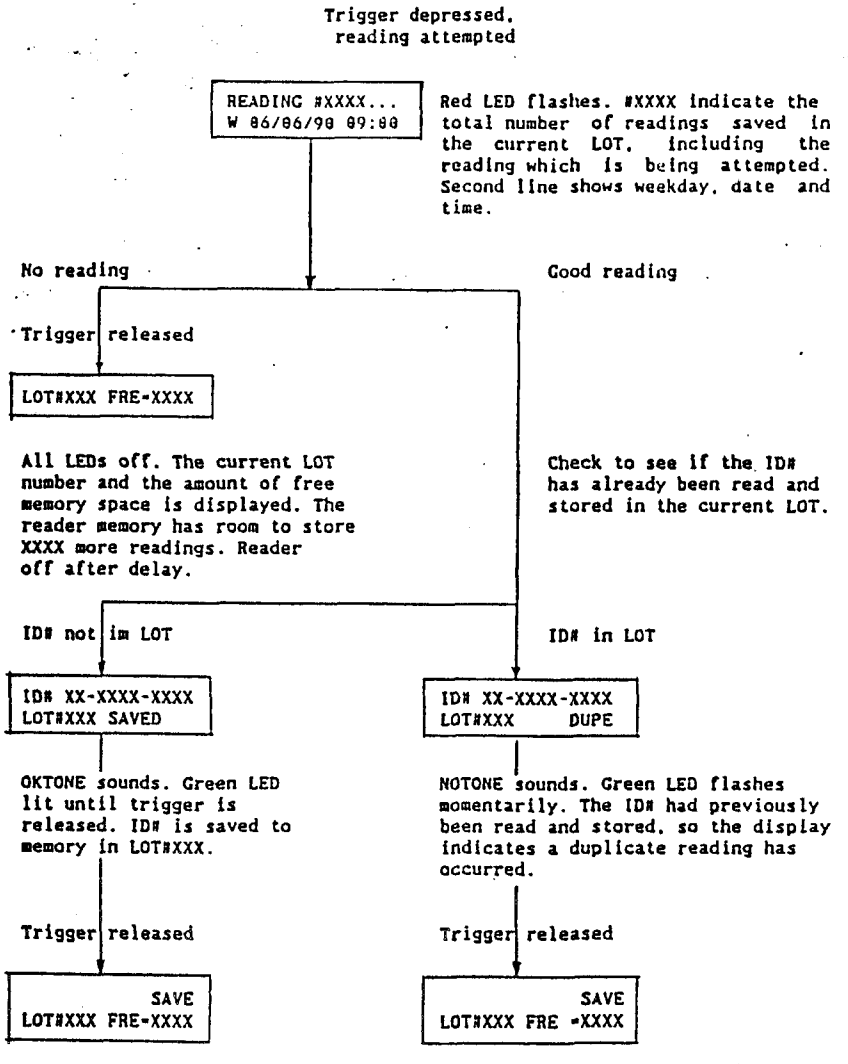
SAVE = YES : SEEK = YES
This type of function is identical to the one described above, but any matching ID numbers are stored in the current LOT. The LOT# must be different to the KEYLOT#. Any ID numbers which do not match the contents of the KEYLOT are displayed, but not stored. If the ID number is already present in the current LOT, the reading is not stored, and the operator is notified that a duplicate reading has occurred.

There is one red and one green light emitting diode (LED) located at the rear of the reader housing to provide the operator with a visual indication of the reader status. A speaker located inside the housing also provides an audible indication. The speaker produces a short high pitched tone whenever the trigger is depressed. In normal operation, two additional types of sound are produced. These sounds are named "OKTONE" and "NOTONE". The OKTONE is a low pitched tone immediately followed by a high pitched tone. NOTONE is a high pitched tone immediately followed by a low pitched tone.

1.3 Reader Displays

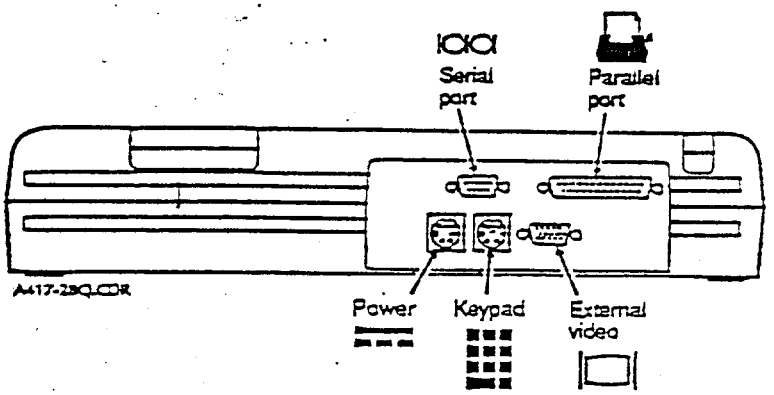
During the four types of reader operation, as defined by the SAVE and SEEK modes, the reader provides information about the reading process to the operator using the LCD display, the LED's, and tones generated by the speaker. The sequence and meanings of the various displays are explained in the following flowcharts.

SAVE = YES : SEEK = NO



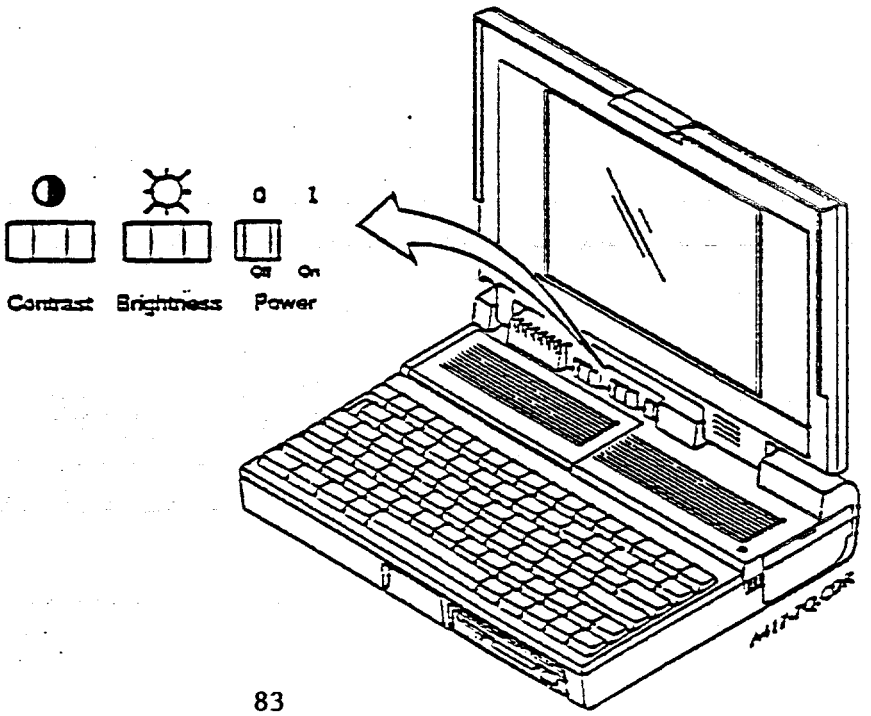
CONNECT COMPUTER TO POWER SOURCE

1. Flip down the port cover at the rear of the computer. Plug the AC adapter into the power connector. Plug the other end into an AC wall outlet.



Turn on the Computer

1. Find the latch on the front of the computer. Reach under the latch and pull it forward slightly.
2. Lift up the liquid-crystal display (LCD) panel until it is at the proper angle for viewing.
3. Slide the power switch to the "1" position.
4. Slide the contrast and brightness controls to the desired position.

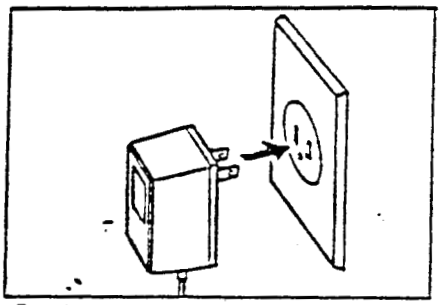


CONNECT TROVAN READER TO COMPUTER

1. Connect a three-way (computer-reader-AC power) 9-pin RS-232 cable from the Comm Port 1 of the Premium Exec 386SX computer to the Trovan RS-232 connector. **ALWAYS CONNECT COMPUTER HAND WAND TO AC POWER SOURCE TO PREVENT BATTERIES DRAINING WHICH COULD BE LETHAL TO YOUR DATA.

CONNECT CANON BUBBLE JET PRINTER (BJ-10e) TO POWER SOURCE

1. Use Canon AC adapter AD-150 to connect printer to power source.



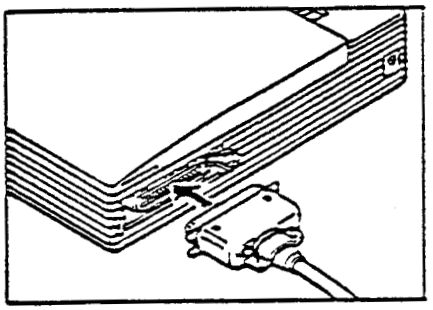
(1) Plug the AC adapter into a properly grounded AC outlet.

CONNECT CANON BUBBLE JET PRINTER (BJ-10e) TO COMPUTER

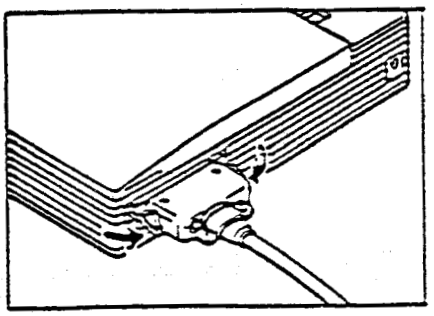
1. Connect one end of the 8-bit parallel interface cable to the interface connection on the right side of the printer. Then engage the lock pins.

2. Connect the other end of the interface cable to the parallel interface connector on the computer.

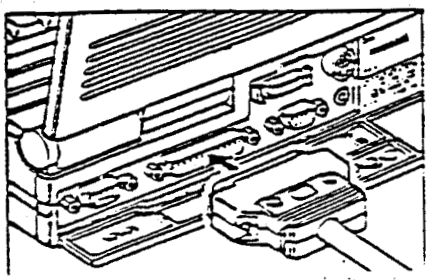
This printer is equipped with an 8-bit parallel interface so that it will operate with IBM PC/AT and other compatibles.



(1) Make sure that both the computer and the printer are turned off.
Connect one end of the parallel interface cable to the parallel interface connector on the right side of the printer.



(2) After plugging in the cable, engage the lock pins.

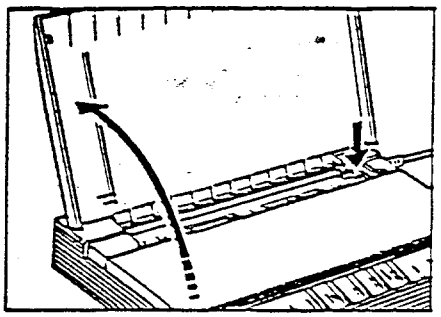


(3) Connect the other end of the interface cable to the parallel interface connector on your computer.

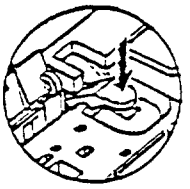
3. Paper Loading

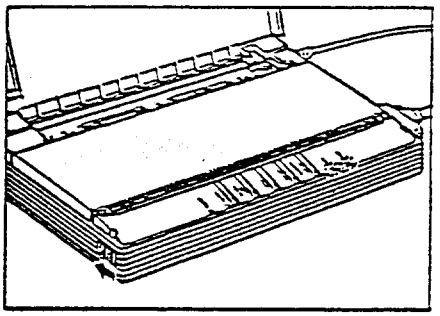
Your printer provides two ways to feed paper. Normal paper is fed through the slot in the top of the printer. Thick paper and envelopes can be fed through the slot in the bottom. Load the paper according to the following procedure.

3.1 Loading from the Upper Slot

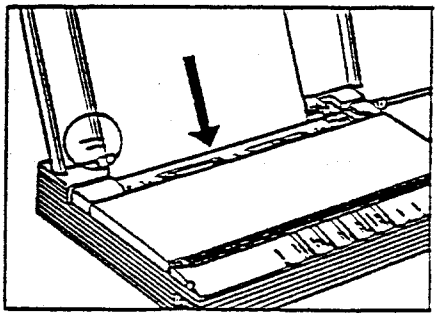


(1) Open the top cover and push the paper release lever down.

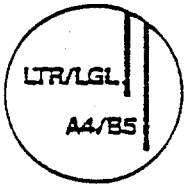


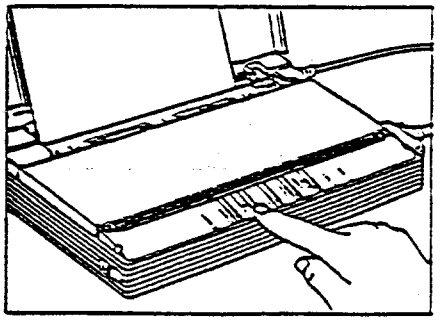


(2) Turn on the power switch. (ERROR and PAPER indicators will light because of paper-out error.)



(3) Match the paper with the paper size scales on the top cover and insert the paper straightly.





(4) Press and hold down the LF/FF switch for one second to advance and position the paper.

Appendix E.3. Sample PIT tag data output file from lot number 1. The last four digits of the PIT tag number for every fifth crab tagged are recorded on the Male Blue King Crab Data form as a cross-check between the electronic tagging file and the on-deck tagging form. Additional file documentation to be written on each data output page is shown below.

Lot No.	PIT Tag No.	Day	Date	Time
1	00-0020-50A4	Monday	07/19/94	10:50:57
1	00-001F-F8B3	Monday	07/19/94	10:51:09
1	00-001D-E0B8	Monday	07/19/94	10:51:15
1	00-0021-758B	Monday	07/19/94	10:51:22
1	00-0021-7B4C	Monday	07/19/94	10:51:27
1	00-0021-6E7E	Monday	07/19/94	10:51:34
1	00-0020-555F	Monday	07/19/94	10:51:40
1	00-001F-F6D2	Monday	07/19/94	10:51:46
1	00-0021-7650	Monday	07/19/94	10:51:52
1	00-0021-D596	Monday	07/19/94	10:51:59
1	00-001F-F7B2	Monday	07/19/94	10:52:05
1	00-0020-54F2	Monday	07/19/94	10:52:11
1	00-0020-57AC	Monday	07/19/94	10:52:18
1	00-0021-D9E6	Monday	07/19/94	10:52:24
1	00-0020-5339	Monday	07/19/94	10:52:38
1	00-0021-D5CE	Monday	07/19/94	10:52:43
1	00-0020-4FAE	Monday	07/19/94	10:52:50
1	00-0021-8590	Monday	07/19/94	10:52:56
1	00-0020-49B8	Monday	07/19/94	10:53:02
1	00-0020-5D27	Monday	07/19/94	10:53:08
1	00-001F-FDF1	Monday	07/19/94	10:53:13
1	00-0021-E27E	Monday	07/19/94	10:53:19
1	00-0021-740A	Monday	07/19/94	10:53:24
1	00-0021-8225	Monday	07/19/94	10:53:30

Reader data file (from disk) will be saved as: *a:\lot1a.dat*

Reader text file (created from lot1a.dat) will be saved as:

a:\lot1a.txt

Appendix E.4. Sample Male Blue King Crab deck form with PIT tag data recorded.

ADF&G MALE BLUE KING CRAB - 1995 ST. MATTHEW POT SURVEY

VESSEL FV / TAGGER STATION NUMBER 55
DATE 07 26 95 BUOY NUMBER NUMBER P L 5
STRATUM 2 NO. CRAB MEASURED 20
TOTAL NO. CAUGHT 700

TAGGER Pit
MEASURER Floy
RECORDER Blair
PAGE 1 OF 7500

	SEQUENTIAL POT NUMBER	SPECIES	SEX	SIZE (mm CL)	LEGAL	SHELL AGE	PIT TAG: CARTRIDGE NO	PIT TAG: TAG READER	PIT TAG: SAVED LOT NO	PIT TAG: PIT TAG ID NO. (last four digits)	FLOY TAG: SERIES	FLOY TAG: TAG NO.	OTHER	COMMENTS
1	72	3	1	137	2	1	25	A	5	50A4	A			
2	1	3	1	128	1		1	\	/		A			
3	/	3	1	133	/		1	\	/		A			
4	/	3	1	150	/		/	\	(		A			
5	/	3	1	129	/	/	/	\	(	6E7E	A			
6	/	3	1	128	/	/	\	\	(		A			
7	\	3	1	131	\	\	\	\	(		A			
8	\	3	1	137	\	/	\	\	(		A			
9	\	3	1	143	/	↓	\	\	(		A			
10	\	3	1	147	/	/	\	\	(	iF7B	A			
11	\	3	1	136	/	2	\	\	(		A			
12	/	3	1	129	/	\	/	\	(		A			
13	/	3	1	128	/	/	/	\	(		A			
14	/	3	1	151	\	/	/	\	(		A			
15	/	3	1	137	/	/	\	\	(	D5CE	A			
16	\	3	1	131	/	/	\	\	(		A			
17	\	3	1	132	/	\	/	\	(		A			
18	\	3	1	140	\	/	/	\	(		A			
19	↓	3	1	150	↓	↓	↓	↓	↓		A			
20	72	3	1	147	2	2	25	A	5	FDF1	A			
21		3	1								A			
22		3	1								A			
23		3	1								A			
24		3	1								A			
25		3	1								A			
26		3	1								A			
27		3	1								A			
28		3	1								A			
29		3	1								A			
30		3	1								A			

STRATUM
1 - Low Density
2 - High Density

LEGAL
1 - Sublegal <5 1/2" CW
2 - Legal ≥ 5 1/2" CW
5 1/2" = 134.75mm

SHELL AGE
0 - Soft
1 - New
2 - Old
3 - Very Old

OTHER
1 - Dead
2 - Alive
3 - Nemerteans in clutch
4 - Turbellarians in clutch
5 - Black mat
6 - Bitter crab disease
7 - "cottage cheese disease
8 - Shell rust
9 - B. callosus

FILE: MALEbkc 7/95

Appendix F. INFORMATION FOR THE SURVEY CREW

SAFETY BRIEFING

*** Check your suit, EPIRB, and strobe prior to departure ***

The captain and crew have been instructed to run through the shipboard safety drill with you prior to departure (as per the contract), including pulling the general alarm, and where you should be in case of an emergency. Do not go on the back deck or anywhere outside when seas are rough, especially alone (no photo or video is worth it). When the gear is being worked, pay attention to buoy lines and trailers, slick decks and pots (ADF&G personnel will not bait or remove bait from pots). Be aware of the cherry picker (crane) at all times, especially when pots are being moved or stacked. Obey the captain in regards to your safety and the safety of others. Be careful.

GENERAL BRIEFING

The purpose of this manual is to provide instructions and information relating to the 1995 St. Matthew blue king crab tagging survey. Refer to it often, especially when in doubt regarding objectives and sampling procedures. Be prepared to accept changes to this manual as we adjust to the reality of the survey; however, standard methodologies will not be changed. Forrest Blau is the cruise leader; assisting personnel are Rance Morrison, Mary Schwenzfeier, and Kim Phillips.

Keep the data safe, as dry as possible and organized. Make sure the deck paperwork tracks with the pilot house records; every pot will have a unique sequential pot number which will enable you to check this on a pot by pot basis. Although it is the cruise leader's responsibility to ensure data soundness, he may delegate this task to the biological crew. Please assist the cruise leader any way you can. If you have questions about the data, the deck protocol, or anything related to the work you are conducting please ask before you act. The cruise leader will note daily any changes in sampling plans.

Review all data forms for accuracy and completeness at the end of each day. The data should be ready for data entry when the vessel arrives in Dutch Harbor at the end of the survey.

Maintain your sampling equipment and ensure that it is cleaned up and stored safely inside the vessel at the end of each sampling day (calipers, clipboards, computer and peripherals, etc.). Particular attention must be paid to the electronic equipment used for PIT tagging as the hand-held readers are fragile and are not waterproof.

Clean up any work areas that you use, including the galley table.Where possible, offer your assistance to the vessel crew. Please clean up after yourselves if you have coffee or snacks between meals. Offers to wash dishes, make coffee, cook, and general cleaning are often appreciated greatly by the vessel crew, especially when you are not working and the vessel crew is.

-Continued-

Time Sheets. For pay periods that will be completed while you are at sea, time sheets will need to be filled out and submitted before you leave for regular pay and sea duty only. Please record standard hours worked in the stop-start columns. Report time you left port and time you returned to port in the comments section. You are not overtime eligible while at sea. For those in "A" retirement, you are eligible for hazard pay only for the hours you worked. This does not include running time to and from the fishing grounds. When you return to Dutch Harbor or Kodiak, turn in an amended time sheet that shows the actual hours worked; this amended time sheet will be submitted and you will receive a pay adjustment for hazard pay. Code timesheets as follows:

BLAU: SEA PAY ONLY (741-47785); REG PAY (YOUR CODE)
MORRISON: SEA ONLY (741-47785); REG PAY (YOUR CODE)
PHILLIPS: REG PAY, SEA DUTY (741-47785): NO HAZARD
SCHWENZFEIER: REG PAY, SEA DUTY, HAZARD (741-47785)

There will be no home-packing of any animals captured during the survey. Collection of crabs for display purposes is authorized through Blau or Morrison.

Radio Schedule. A daily radio schedule will be maintained with ADF&G Kodiak or Dutch Harbor or with Dutch Harbor if vessel cannot hail Kodiak. If all else fails, ADF&G will monitor vessel check-in through the vessel's home cannery on its daily schedule with the Notorious. Vessel location will be reported either by lat/long or by survey station number. A summary of stations sampled each day will be reported.

Hail Kodiak ADF&G (WHM 29) on 5195 at 1530 hrs

If reception is poor, switch to 3230 (WON 32). In addition, ADF&G Kodiak has 3201, 4125, 2512. Dutch Harbor ADF&G has 4125 (WIM 76) and 3230 (WOM 32).

MISCELLANEOUS INSTRUCTIONS AND REMINDERS

1. Leave timesheets with Marilyn in Dutch OR FAX them to Kodiak.
2. Check your survival suit, EPIRB and strobe prior to departure.
3. Check your supply of forms, sampling equipment, and rain gear prior to departure.
4. Questions regarding the contract between ADF&G and the vessel may be resolved by reviewing the contract in Appendix F.
5. Leave all receipts for purchases and signed timesheets for August 15, 1995 with Marilyn.
6. If there are no forms to record other data you collect, make them up. The Pilot House Logs must be completed at the end of each day. Complete every column in every form as required.
7. Be careful and have fun.

-Continued-

LIST OF EQUIPMENT

1. Survival suit with EPIRB and strobe attached
2. Rain gear, gloves and boots
3. Four Shipboard Instruction Manuals (for each ADF&G biologist)
4. Forms:

    a. Pilot House Log - Survey Stations (60)
    b. Male Blue King Crab Form (7 reams = 3500)
    c. Female Blue King Crab Form (7 reams = 3500)
    d. Crab Research Data Form (1 ream = 500)
    e. Observer Practicum Record (5)
    f. Male Blue King Crab Daily Tagging Record (5)

5. 1 pair small (6") dial calipers
6. 4 pair large calipers (3 from Kodiak, 1 from Dutch)
7. 5.5 inch measuring sticks (metal alloy)
8. film and camera (optional)
9. video camera and tapes (optional)
10. Rite-in-Rain notebooks (5)
11. pencils (2 doz. sharpened)
12. paper clips (ass't)
13. rubber bands (50 thick ones)
14. manila envelopes for data (1 legal-size, 12 regular)
15. permanent markers (1 large black; 1 ea small black, red)
16. clipboard(s) 1 legal size for captain; 6-8 regular size
17. calculator w/batteries
18. ear plugs (12 pair)
19. one can WD-40
20. statcharts (2)
21. timesheets (10)
22. toolbox for tagging/sampling equipment
23. 16' power extension cord
24. Tagging Equipment

    A. Floy Tagging

        1. wire for tagging needles
        2. 8" channel locks for crimping swedges (2)
        3. stainless steel rods for racking/ordering tags (10)
        4. Floy tags: series "A" 4,176 - 13,000

-Continued-

B. PIT Tagging

1. Ralgo tagging guns (4)
2. needles for tagging guns (12)
3. fine grain whetstone for sharpening needles
4. 5,000 12-mm Trovan PIT tags; preloaded in 208 labeled cartridges
5. 2 boxes 3.5 inch diskettes (20)
6. 3 Trovan hand-held scanners (A, B, and C)
7. laptop computer w/cables and connectors for scanner and printer interfaces
8. Canon Bubblejet printer w/page feeder and power cord
9. 1 ream 8.5x11 paper

APPENDIX G: CONTRACT BETWEEN THE STATE OF ALASKA AND THE FV NOTORIOUS

INVITATION TO BID MODIFIED INVITATION NO. 2056

RETURN THIS BID TO THE ISSUING OFFICE AT:

Attn: Leslie J. Watson
Alaska Department of Fish and Game
Commercial Fisheries Management and
Development Division
211 Mission Road
Kodiak, Alaska 99615

THIS IS NOT AN ORDER ISSUE DATE: June 16, 1995

BID TITLE: CONTRACT FOR VESSEL CHARTER IN THE ST. MATTHEW SECTION, BERING SEA AREA "Q", FOR THE PURPOSE OF KING CRAB RESEARCH FOR THE DEPARTMENT OF FISH AND GAME

INSTRUCTIONS TO BIDDERS:

*** Please refer to modified ITB #2056 (attached) for conditions, requirements and terms of this vessel charter. Complete all required sections and return pages 13 - 17 along with the bid to the Alaska Department of Fish and Game, Kodiak Office, NO LATER THAN 4:30 P.M., JUNE 23, 1995.

DELIVERY LOCATION: Dutch Harbor, Alaska (St. Matthew Section, Area "Q")
DELIVERY DATE: See Text
FOB POINT: Dutch Harbor, Alaska (St. Matthew Section, Area "Q")

BIDDER'S NOTICE: By signature on this form, the bidder certifies that:
(1) the bidder has a valid Alaska business license and has written the license number below or has submitted one of the following forms of evidence of an Alaska business license:
* a cancelled check for the business license fee;
* a copy of the business license application with a receipt date stamp from the State's business license office;
* a receipt from the State's business license office for the license fee;
* a copy of the bidder's valid business license;
* a sworn notarized affidavit that the bidder has applied and paid for a business license;
(2) the price(s) submitted was arrived at independently and without collusion and that the bidder is complying with:
* the laws of the State of Alaska;
* the applicable portion of the Federal Civil Rights Act of 1964;
* the Equal Employment Opportunity Act and the regulations issued thereunder by the State and Federal government; and
* all terms and conditions set out in this ITB.
If any bidder fails to comply with (1) or (2) of this paragraph, the State may reject the bid, terminate the contract, or consider the contractor in default.

Leslie J Watson
LESLIE J. WATSON for
ROXIE ARAGONES
PROCUREMENT SPECIALIST

TELEPHONE NUMBER:
907-486-1854
FAX NUMBER:
907-486-1841 or 907-486-1824

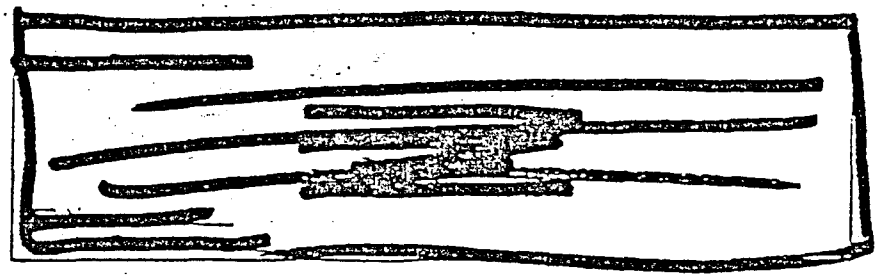
NOTORIOUS Partnership
COMPANY SUBMITTING BID
M Byrne
AUTHORIZED SIGNATURE
Mark Byrne
PRINTED NAME
6/22/95
DATE
206213
ALASKA BUSINESS LICENSE NUMBER

STANDARD TERMS AND CONDITIONS

INSTRUCTIONS TO BIDDERS:

1. INVITATION TO BID (ITB) REVIEW: Bidders shall carefully review this ITB for defects and questionable or objectionable material. Bidders' comments concerning defects and questionable or objectionable material in the ITB must be made in writing and received by the purchasing authority at least ten (10) days before the bid opening date. This will allow time for an amendment to be issued if one is required. It will also help prevent the opening of a defective bid, upon which award cannot be made, and the resultant exposure of bidders' prices. Bidders' original comments should be sent to the purchasing authority listed on the front of this ITB.

2. BID FORMS: Bidders shall use this and attached forms in submitting bids. A photocopied bid may be submitted.



4. PRICES: The bidder shall state prices in the units of issue on this ITB. Prices quoted for commodities must be in U.S. funds and include applicable federal duty, brokerage fees, packaging, and transportation cost to the FOB point so that upon transfer of title the commodity can be utilized without further cost. Prices quoted for services must be quoted in U.S. funds and include applicable federal duty, brokerage fee, packaging, and transportation cost so that the services can be provided without further cost. Prices quoted in bids must be exclusive of federal, state, and local taxes. If the bidder believes that certain taxes are payable by the State, the bidder may list such taxes separately, directly below the bid price for the affected item. The State is exempt from Federal Excise Tax except the following:

- Coal - Internal Revenue Code of 1986 (IRC), Section 4121 - on the purchase of coal;
- "Gas Guzzler" - IRC, Section 4064 - on the purchase of low m.p.g. automobiles, except that police and other emergency type vehicles are not subject to the tax;
- Air Cargo - IRC, Section 4271 - on the purchase of property transportation services by air;
- Air Passenger - IRC, Section 4261 - on the purchase of passenger transportation services by air carriers.

5. VENDOR TAX ID NUMBER: If goods or services procured through this ITB are of a type that is required to be included on a Miscellaneous Tax Statement, as described in the Internal Revenue Code, a valid tax identification number must be provided to the State of Alaska before payment will be made.

6. FILING A PROTEST: A bidder may protest the award of a contract or the proposed award of a contract for supplies, services, or professional services. The protest must be filed in writing and include the following information: (1) the name, address, and telephone number of the protester; (2) the signature of the protester or the protester's representative; (3) identification of the contracting agency and the solicitation or contract at issue; (4) a detailed statement of the legal and factual grounds of the protest, including copies of relevant documents; and (5) the form of relief requested. Protests will be treated in accordance with Alaska Statutes (AS) 36.30.560-36.30.610.

CONDITIONS:

1. AUTHORITY: This ITB is written in accordance with AS 36.30 and 2 AAC 12.

2. COMPLIANCE: In the performance of a contract that results from this ITB, the contractor must comply with all applicable federal, state, and borough regulations, codes, and laws; and be liable for all required insurance, licenses, permits and bonds; and pay all applicable federal, state, and borough taxes.

3. SUITABLE MATERIALS, ETC.: Unless otherwise specified, all materials, supplies or equipment offered by a bidder shall be new, unused, and of the latest edition, version, model or crop and of recent manufacture.

4. SPECIFICATIONS: Unless otherwise specified in the ITB, product brand names or model numbers specified in this ITB are examples of the type and quality of product required, and are not statements of preference. If the specifications describing an item conflict with a brand name or model number describing the item, the specifications govern. Reference to brand name or number does not preclude an offer of a comparable or better product, if full specifications and descriptive literature are provided for the product. Failure to provide such specifications and descriptive literature may be cause for rejection of the offer.

5. FIRM OFFER: For the purpose of award, offers made in accordance with this ITB must be good and firm for a period of ninety (90) days from the date of bid open

6. EXTENSION OF PRICES: In case of error in the extension of prices in the bid, the unit prices will govern; in a lot bid, the lot prices will govern.

7. BID PREPARATION COSTS. The State is not liable for any costs incurred by the bidder in bid preparation.

8. CONSOLIDATION OF AWARDS. Due to high administrative costs associated with processing of purchase orders, a single low bid of $50 or less may, at the discretion of the State, be awarded to the next low bidder receiving other awards for consolidation purposes. This paragraph is not subject to the protest terms enumerated in "*INSTRUCTION TO BIDDERS*", "FILING A PROTEST" above.

9. CONTRACT FUNDING. Bidders are advised that funds are available for the initial purchase and/or the first term of the contract. Payment and performance obligations for succeeding purchases and/or additional terms of the contract are subject to the availability and appropriation of funds.

10. CONFLICT OF INTEREST. An officer or employee of the State of Alaska may not seek to acquire, be a party to, or possess a financial interest in, this contract if (1) the officer or employee is an employee of the administrative unit that supervises the award of this contract or (2) the officer or employee has the p to take or withhold official action so as to affect the award or execution of the contract.

11. ASSIGNMENT(S): Assignment of rights and duties under a contract resulting from this ITB is not permitted unless authorized in writing by the State of Alas Department of Administration, Division of General Services.

12. SUBCONTRACTOR(S): Within five (5) working days of notice, the apparent low bidder must submit a list of the subcontractors that will be used in the performance of the contract. The list must include the name of each subcontractor and the location of the place of business for each subcontractor and evidence of each subcontractor's valid Alaska business license. Subcontractors can only be changed per AS 36.30.115 (b).

13. FORCE MAJEURE: (Impossibility to perform) The contractor is not liable for the consequences of any failure to perform, or default in performing, any of it obligations under this Agreement, if that failure or default is caused by any unforeseeable Force Majeure, beyond the control of, and without the fault or negligence the contractor. For the purposes of this Agreement, Force Majeure will mean war (whether declared or not); revolution; invasion; insurrection; riot; civil commotio sabotage; military or usurped power; lightning; explosion; fire; storm; drought; flood; earthquake; epidemic; quarantine; strikes; acts or restraints of governmental authorities affecting the project or directly or indirectly prohibiting or restricting the furnishing or use of materials or labor required; inability to secure materials, machinery, equipment or labor because of priority, allocation or other regulations of any governmental authorities.

14. LATE BIDS. Late bids are bids received after the time and date set for receipt of the bids. Late bids will not be accepted.

15. CONTRACT EXTENSION: Unless otherwise provided in this ITB, the State and the successful bidder/contractor agree: (1) that any holding over of the con excluding any exercised renewal options, will be considered as a month-to-month extension, and all other terms and conditions shall remain in full force and effect (2) to provide written notice to the other party of the intent to cancel such month-to-month extension at least thirty (30) days before the desired date of cancellation

16. DEFAULT: In case of default by the contractor, for any reason whatsoever, the State of Alaska may procure the goods or services from another source and hol the contractor responsible for any resulting excess cost and may seek other remedies under law or equity.

17. DISPUTES: Any dispute arising out of this agreement shall be resolved under the laws of Alaska. Any appeal of an administrative order or any original action enforce any provision of this agreement or to obtain any relief from or remedy in connection with this agreement may be brought only in the superior court for the I Judicial District of Alaska.

18. CONSUMER ELECTRICAL PRODUCT: AS 45.45.910 requires that "...a person may not sell, offer to sell, or otherwise transfer in the course of the person's business a consumer electrical product that is manufactured after August 14, 1990, unless the product is clearly marked as being listed by an approved third party certification program." Electrical consumer products manufactured before August 14, 1990, must either be clearly marked as being third party certified or be marke with a warning label that complies with AS 45.45.910(e). Even exempted electrical products must be marked with the warning label. By signature on this bid the bidder certifies that the product offered is in compliance with the law. A list of approved third party certifiers, warning labels and additional information is available from: Department of Labor, Labor Standards & Safety Division, Mechanical Inspection Section, P.O. Box 107020, Anchorage, Alaska 99510-7020, (907)[illegible]

SPECIAL CONDITIONS:

1. ORDER DOCUMENTS: Except as specifically allowed under this ITB, an ordering agency will not sign any vendor contract. The State is not bound by a vend contract signed by a person who is not specifically authorized to sign for the State under this ITB. The State of Alaska Purchase Order, Contract Award and Delive Order are the only order documents that may be used to place orders against the contract(s) resulting from this ITB.

2. BILLING INSTRUCTIONS: Invoices must be billed to the ordering agency's address shown on the individual Purchase Order, Contract Award or Delivery O not to the Division of General Services. The ordering agency will make payment after it receives the merchandise or service and the invoice. Questions concernin payment must be addressed to the ordering agency.

3. CONTINUING OBLIGATION OF CONTRACTOR: Notwithstanding the expiration date of a contract resulting from this ITB, the contractor is obligated to fulfill its responsibilities until warranty, guarantee, maintenance and parts availability requirements have completely expired.

PREFERENCES:

[redacted]

STANDARD TERMS AND CONDITIONS

2. USE OF LOCAL FOREST PRODUCTS: In a project financed by state money in which the use of timber, lumber and manufactured lumber is required, only timber, lumber and manufactured lumber products originating in this state shall be used unless the use of those products has been determined to be impractical, in accordance with AS 36.15.010.

3. LOCAL AGRICULTURAL AND FISHERIES PRODUCTS PREFERENCE: When agricultural, dairy, timber, lumber, or fisheries products are purchased using state money, only those products harvested in Alaska, or in the case of fisheries products harvested or processed within the jurisdiction of Alaska, will be purchased, provided they are available, of comparable quality, and priced no more than seven percent (7%) higher than products harvested outside the state, or in the case of fisheries products harvested or processed outside the jurisdiction of the state, in accordance with AS 36.15.050.

4. ALASKA PRODUCT PREFERENCE: A bidder that designates the use of an Alaska Product which meets the requirements of the ITB specification and is designated as a Class I, Class II or Class III Alaska Product by the Department of Commerce & Economic Development shall receive a preference in the bid evaluation in accordance with AS 36.30.332 and 3 AAC 92.010.

5. EMPLOYMENT PROGRAM PREFERENCE: If a bidder qualifies for the Alaskan bidder's preference, under AS 36.30.170(b), and is offering goods or services through an employment program, as defined under 36.30.990(10), and is the lowest responsive and responsible bidder with a bid that is no more than fifteen percent (15%) higher than the lowest bid, the procurement officer will make the award to that bidder, in accordance with AS 36.30.170(c) and 2 AAC 12.050.

6. ALASKANS WITH DISABILITIES PREFERENCE: If a bidder qualifies for the Alaskan bidder's preference, under AS 36.30.170(b), and is a sole proprietorship owned by a person with a disability, as defined in AS 36.30.170(j), and is the lowest responsive and responsible bidder with a bid that is no more than ten percent (10%) higher than the lowest bid, the procurement officer will make the award to that bidder, in accordance with AS 36.30.170(e).

7. EMPLOYERS OF PEOPLE WITH DISABILITIES PREFERENCE: If a bidder qualifies for the Alaskan bidder's preference, under AS 36.30.170(b), and, at the time the bid is submitted, employs a staff that is made up of fifty percent (50%) or more people with disabilities, as defined in AS 36.30.170(j), and submits a responsive and responsible bid that is no more than ten percent (10%) higher than the lowest responsive and responsible bid, the procurement officer will make the award to that bidder, in accordance with AS 36.30.170(f).

8. PREFERENCE QUALIFICATION LETTER: Regarding preferences 5, 6, and 7 above, the Division of Vocational Rehabilitation in the Department of Education maintains lists of Alaskan: [1] employment programs that qualify for preference, [2] individuals who qualify for preference as Alaskan's with disabilities, and, [3] employers who qualify for preference as employers of people with disabilities.

As evidence of an individual's or a business' right to a certain preference, the Division of Vocational Rehabilitation will issue a certification letter. To take advantage of the preferences 5, 6, or 7 above, an individual or business must be on the appropriate Division of Vocational Rehabilitation list, at the time the bid is opened, and must provide the procurement officer a copy of their certification letter. Bidders must attach a copy of their certification letter to their bid. The bidder's failure to provide the certification letter mentioned above, with their bid, will cause the State to disallow the preference.

STATE OF ALASKA ITB = 2056
KING CRAB VESSEL CHARTER IN ST. MATTHEW SECTION OF THE BERING SEA

PURPOSE: Contract of a vessel, with Captain and three (3) crew, for the use of Department of Fish and Game (F&G) as living quarters and an operations base for monitoring and research activities relating to king crab research studies in the St. Matthew section of the Bearing Sea, Registration Area "Q". F&G will place four (4) of their personnel aboard the vessel. Biologists will study the crabs which are captured and monitor all catches. Approximately twenty-one (21) days of charter time will be devoted to at-sea research.

DEFAULT: A contractor's failure to comply with any of the terms and conditions of this contract may result in a default action by the State.

COMPLIANCE: The bidder must comply with all applicable national, federal, State, local and borough regulations, codes, and laws; be liable for all required insurance, licenses, permits and bonds; pay all applicable federal, State, local and borough taxes.

NOTICE OF INTENT: After the responses to this Invitation to Bid (ITB) have been opened and evaluated a tabulation of the bids will be prepared. This tabulation, called a Notice of Intent, serves two purposes. It lists the name of each company or person that offered a bid and the price they bid. It also serves as notice of the State's intent to award a contract(s) to the bidder(s) indicated. A copy of the Notice of Intent will be mailed to each company or person who responded to the ITB. Bidders, identified as the apparent low responsive bidders, are instructed not to proceed until a Purchase Order, Contract Award, Lease, or, some other form of written notice is given by the Contracting Officer. A company or person who proceeds prior to receiving a Purchase Order, Contract Award, Lease, or, some other form of written notice from the Contracting Officer does so without a contract and at their own risk.

PAYMENT FOR STATE PURCHASES: Payment for agreements under $500,000, for the undisputed purchase of goods or services provided to a State agency, will be made within 30 days of the receipt of a proper billing or the delivery of the goods or services to the location(s) specified in the agreement, whichever is later. A late payment is subject to 1.5% interest per month on the unpaid balance. Interest will not be paid if there is a dispute or if there is an agreement which establishes a lower interest rate or precludes the charging of interest.

FEDERAL EXCISE TAX: The State of Alaska is exempt from Federal Excise Tax except the following:

- Coal - Internal Revenue Code of 1986 (IRC), Section 4121 - on the purchase of coal;
- "Gas Guzzler" - IRC, Section 4064 - on the purchase of low m.p.g. automobiles, except that police and other emergency type vehicles are not subject to the tax;
- Air Cargo - IRC, Section 4271 - on the purchase of property transportation services by air;
- Air Passenger - IRC, Section 4261 - on the purchase of passenger transportation services by air charter.

CONTRACT ENFORCEMENT: Enforcement of this contract is the responsibility of the Division of General Services (DGS) Contracting Officer. When a State agency has a complaint concerning a contractor's performance the agency must contact DGS in writing. Facsimile notification at (907) 465-2189 is also acceptable. DGS will contact the contractor and resolve the matter.

STATE OF ALASKA ITB = 2056
KING CRAB VESSEL CHARTER IN ST. MATTHEW SECTION OF THE BERING SEA

FIRM AND UNQUALIFIED (UNCONDITIONAL) OFFER: Bidder's must provide enough information, with their bid, to constitute a definite, firm, and unqualified or unconditional offer. In order to be responsive a bid must constitute a definite, firm, and unqualified or unconditional offer to meet all of the meaningful or material terms of the ITB. Some meaningful or material terms are those items which could affect price, quantity, quality, or delivery. Also included as meaningful or material terms are those which are clearly identified in the ITB, and which, for reasons of policy, must be complied with at risk of bid rejection for nonresponsiveness.

BIDDER'S NOTE: This contract involves financial risks. Please read this ITB very carefully and make certain you understand the risks and responsibilities. If you have any questions contact [redacted]; LESLIE WATSON 907 486 1854

HOLD HARMLESS: The contractor will indemnify, save harmless and defend the State, its officers, agents and employees from all liability, including costs and expenses, for all actions or claims resulting from injuries or damages sustained by any person or property arising directly or indirectly as a result of any error, omission or negligent act of the contractor, subcontractor or anyone directly or indirectly employed by them in the performance of this contract.

All actions or claims including costs and expenses resulting from injuries or damages sustained by any person or property arising directly or indirectly from the contractor's performance of this contract which are caused by the joint negligence of the State and the contractor will be apportioned on a comparative fault basis. Any such joint negligence on the part of the State must be a direct result of active involvement by the State.

INSURANCE: The contractor will maintain insurance satisfactory to the Division of Risk Management, Department of Administration. Certificates of Insurance will be furnished to the Contracting Officer which will provide for a 30 day prior notice of cancellation, nonrenewal or material change in such insurance.

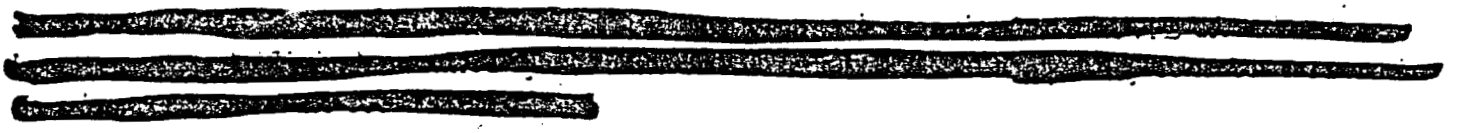
Proof of insurance is required for the following:

A. Protection and Indemnity, including crew exposure, in the amount of $1,000,000.00.

Failure to supply satisfactory proof of insurance within the time required will cause the State to declare the bidder nonresponsible and to reject the bid.

LENGTH OF CONTRACT: Approximately twenty-one (21) continuous days, as biological and weather conditions permit, between approximately August 1, 1995 and August 21, 1995. The length of the charter and starting date may vary by mutual agreement between the vessel owner and the State of Alaska but payment will not exceed the twenty-one (21) day period. Charter service to begin and end in Dutch Harbor, Alaska.

CANCELLATION: The State reserves the right to cancel the contract at the State's sole discretion.



ESTIMATED USE: The charter dates and length of charters referenced in this ITB are the State's estimated requirements. The State does not guarantee a minimum or maximum number of charter days. However, for the purpose of bid evaluation the State will assume the use of twenty-one (21) contract days.

LOCATION OF VESSEL OPERATION: The vessel is required to operate in the St. Matthew Island section of the Bering Sea, Registration area "Q". The charter will begin and end in Dutch Harbor, Alaska.

CAPTAIN AND CREW ABOARD THE VESSEL: This contract requires a vessel Captain and three (3) crew members. The experience and licensing requirements are set out below.

STATE PERSONNEL ABOARD THE VESSEL: During this contract the State will place four (4) biological crew members aboard the vessel.

VESSEL INSPECTION: The vessel will be subject to inspection by the Department of Fish and Game. The bidder(s) must, upon 10 days notice, make the vessel available for inspection at Dutch Harbor, Alaska.

By the date set for the vessel inspection, all of the equipment called for in this ITB must be installed and functional. The successful bidder must pay the cost of all the equipment and of any vessel alterations needed to meet the requirements of this ITB.

If, at the time of inspection, a vessel fails to meet the ITB requirements, the State may consider the offer non-responsive and reject the bid or terminate the contract.

A USCG Certificate of Inspection may be required, depending on the type/size vessel offered.

SEAWORTHINESS: Inspection of the vessel is not intended to convey acceptance by the State nor should it be considered conclusive evidence that the State believes the vessel is seaworthy. If during the department's inspection or at any time during the subsequent term of the contract, conditions are noted that might affect the safety or seaworthiness of the vessel, the State will arrange for further inspection by a person with the appropriate credentials to determine if the condition of the vessel is acceptable.

STATE OF ALASKA ITB = 2056
KING CRAB VESSEL CHARTER IN ST. MATTHEW SECTION OF THE BERING SEA

VESSEL REQUIREMENTS:

A. Length of not less than ninety (90) feet. Length will be determined by measuring the centerline.

B. Sleeping space for four (4) State personnel, in addition to the Captain and crew. Each sleeping space used by State personnel must be at least 26 inches in width at the shoulders and 77 inches long.

C. Minimum nine cubic feet of dry storage drawer space for State equipment.

D. Minimum six square feet of flat, clear, interior work space for daily data entry work by State personnel. Galley table is acceptable. One 110 volt AC outlet must be available near this area.

E. Minimum four square feet of flat, clear, interior work space, either shelf or table, in a relatively undisturbed location, for semi-permanent installation of an electronic data entry device during the charter period. One 110 volt AC outlet must be available near this area.

F. Minimum 500 square feet of flat, clear, exterior deck work space for State personnel. Vessels with shelter decks are highly preferred. This work area must be well lit (direct lights within a radius of six feet of State personnel) to permit work at night, including data recording and tagging. If fixed lighting is unavailable, responsive vessels must have mobile lighting, power cords, and all associated accessories to make a temporary installation of required lighting.

G. Stove, oven, sink, galley table, and all materials and equipment necessary for daily meal preparation, cooking, and clean-up.

H. Refrigerated storage space sufficient to maintain fresh food for all personnel for the duration of longest continuous period of operation.

I. Freezer storage space sufficient to maintain frozen food for all personnel for the duration of longest continuous period of operation and sufficient to maintain frozen bait herring for the duration of longest continuous period of operation.

J. Water storage or seawater conversion capable of providing sufficient fresh water to permit twenty-one (21) continuous days of operation. Water supply must be sufficient to permit daily washing of dishes, clothing, and showers for all personnel.

K. Radar, with a minimum range of 40 miles, in good operating condition.

L. Automatic pilot in good operating condition. Automatic readout Loran C. Back-up system is desirable. Fathometer with 150 fathom range. Back-up system is desirable. Minimum of two anchors with ground tackle: all of the size and type required for the size and type of vessel chartered.

M. Radio transmitter and receiver in good operating condition equipped with standard marine frequencies for the area in which operations will be conducted including VHF channels 7 and 16

and in good working condition. Radio-transceiver: Single side-band frequencies 2309 (for receiving) and 2131 (for transmitting) to allow direct communication with RCA Alaska Communications, Inc. Back-up system is desirable.

N. USCG approved first-aid kit.

O. USCG approved fire-fighting equipment of the size and type required for the size and type vessel chartered.

P. USCG approved life rafts. The rated capacity of the rafts must be adequate to accommodate all of the people aboard the vessel, this includes the Captain, the vessel crew and all of the biological crew.

Q. Survival suits are required for all of the people aboard the vessel. This includes the Captain, the vessel crew, and all of the biological crew. Sizes large and extra-large.

R. The vessel's main engine(s) must be diesel powered. Bids offering gasoline powered vessels will be rejected as nonresponsive.

S. Power block to pull crab gear, minimum capacity 650 pounds.

T. Bait chopper and sampling table (minimum 4 feet by 8 feet) for biologists.

U. Skiff and outboard engine, minimum length of 10 feet and minimum 10 horsepower.

V. Vessel must be equipped with 150 rectangular King Crab pots, with lines, buoys, and bait jars. All pots must be identical in size and dimension, including mesh sizes on all panels and tunnel eye openings. All pots must have opilio curtains.

VESSEL CREW REQUIREMENTS:

(a) Crew to consist of a Captain with at least five (5) years of crab pot fishing experience in the Bering Sea and three (3) experienced fishermen. One of the fishermen must be an engineer with five (5) years experience aboard fishing vessels and fully knowledgeable of the vessel and equipment. Vessel crew will be expected to perform cooking and cleaning duties in addition to operating the vessel and assisting biologists by handling catches as prescribed by the biological crew leader.

(b) The vessel crew will be expected to fish the gear. The biological crew will handle sampling of catches once they are aboard the vessel.

(c) The State will have the right to require replacement of any vessel crew member. If the vessel operates shorthanded due to replacement or illness of a vessel crew member for a period in excess of twenty-four (24) hours, the State will deduct from the charter rate for that period of time an amount equal to the missing crewman's wages and related direct cost of employment (i.e., social security tax, unemployment insurance, etc.). The total cost of replacing a vessel

crew member aboard the vessel will be at the owner's expense. The owner will be responsible for payment of wages, direct cost of employment and responsible for all vessel crew members. The State will be responsible for payments of daily charter rates only, and will not reimburse the owner for vessel crew wages.

(d) Captain will be required to complete proper fishing forms for each day of fishing, including recording weather conditions and fishing location data. Captain and vessel crew will be required to locate scheduled fishing areas.

(e) There shall be no alcohol or controlled substances aboard the charter vessel during the charter.

UNUSUAL HOURS: It may be necessary to run the vessel 24 hours continuously to travel from one location to another. Further, it may be necessary to set or lift gear at night (midnight) or early in the morning (midnight to 6 a.m.).

DELAYS OR INTERRUPTIONS OF OPERATIONS: For each hour of contract time lost, for any reason other than weather or an act directly attributable to State personnel aboard the vessel, the State will, on each occasion, be entitled to deduct from the total contract payment, an amount equal to the hourly contract rate for each of the hours the vessel or essential equipment on the vessel is out of service.

TERMINATION OF THE CONTRACT: The State may, without fault or liability, terminate the contract for any of the following reasons:

1) The condition of the vessel or essential equipment on the vessel remains such that it cannot be used for work by the biological crew for a period of more than seventy-two (72) hours.

2) Lack of funds for the contract project.

3) Insubordination and/or lack of cooperation by the Captain or vessel crew.

4) Failure of the Captain, vessel, or vessel crew to report at the time and location specified in this ITB to begin the contract.

In the event of early termination of the contract, State-owned gear may be placed in storage or returned to a location that is mutually agreed upon by the State and the vessel owner. Charges for gear storage will be paid by the State. The State will not assume any liability for transporting the Captain and vessel crew to their home port. Contract payments will cease on the hour and date the vessel is unable to continue normal operations.

PERFORMANCE REQUIREMENTS OF THE VESSEL CAPTAIN & COMMAND OF THE VESSEL:

A. Either underway or at anchor the vessel Captain's orders will be final in matters regarding the general operation of the vessel, the operation of the vessel's equipment and fishing gear, the general activities and safety of the vessel crew and biological crew, and the navigation of the vessel.

B. The vessel Captain will comply with all orders given by the biological crew leader regarding the State's research activities, provided that those orders do not endanger the vessel or the people aboard the vessel.

C. The vessel Captain will obey all USCG, State and other applicable regulations, rules, and statutes pertaining to the safe and legal operation of the vessel.

PERFORMANCE REQUIREMENTS OF THE VESSEL CREW MEMBERS: In the role of operations base and living quarters for State personnel, the vessel, its Captain and crew will be required to provide these services and accommodations:

A. General navigation and operation of the vessel either underway or at anchor.

B. Space for compiling and analyzing the data collected.

C. Communications base for dispersing information.

D. Basic living accommodations for four (4) State biologists and technicians.

E. Meal preparation, cooking and clean-up.

F. General cleaning of the interior and exterior of the vessel.

G. General assistance to the State personnel in the performance of their work. Crew will be expected to handle catches as prescribed by the crew leader and will be expected to fish the gear. The biological crew will handle sampling of catches once they are aboard the vessel.

H. The Captain must provide a safety orientation briefing to all vessel and biological crew members prior to embarkation from Dutch Harbor. Both the crew and personnel must have general instructions on the following:

1. The location and operation of lifesaving and emergency equipment (life rings, life rafts, immersion/survival suits, activating general alarm).

2. Operation of assigned equipment.

3. How to make a distress call.

4. What to do in the event of a person overboard.

5. What to do in the event of a fire.

6. What to do in the event of flooding.

7. What to do in the event of abandon ship order.

CONSUMABLES TO BE PROVIDED BY THE CONTRACTOR AND INCLUDED IN THE PER DAY CONTRACT PRICE:

- The contractor will provide all fuel, lubricants, oils, greases and filters required during the contract. At the beginning of the contract all fuel and lubricant tanks must be full and all filters must be fresh. In addition, the vessel must have aboard extra lubricants, oils, greases and filters in amounts sufficient for the entire contract period.

- The contractor will provide all bait for the entire charter period.

- The contractor will provide three ample, balanced, and nutritious meals each day for all biological crew, the vessel Captain and the vessel crew.

MISCELLANEOUS PROVISIONS: The State may, at it's own expense and only for the term of the contract, install and retain in the vessel equipment necessary to accomplish their work. The State will remove this equipment at the termination of the contract period without damage to the vessel.

STATE OF ALASKA ITB # 2056
KING CRAB VESSEL CHARTER IN ST. MATTHEW SECTION OF THE BERING SEA

VESSEL INFORMATION FORM: Bidders must complete the vessel information form below. A bidder's failure to complete the vessel information form may cause the State to reject the bid as nonresponsive.

OWNER'S NAME: Notorious Partnership

ADDRESS: 3600 15th Ave W # 202
Seattle WA 98119

PHONE: (206) 281-7145

VESSEL NAME AND NUMBER: F/V Notorious ADF&G # 00987

VESSEL TYPE: Crabber

CURRENT LOCATION OF VESSEL: Bristol Bay

CALL NUMBERS AND FREQUENCY: WCL5674

YEAR BUILT: 1944
Rebuilt 1994

REGISTRY NUMBER: 291882

CRUISING SPEED KNOTS: _____

OVERALL LENGTH: 130'
(Straight line measurement from end to end over the deck, excluding sheer, measured parallel to the centerline.)

VESSEL WEIGHT: 296 Gross
201 NET

DIESEL POWERED MAIN ENGINE: [✓] YES [ ] NO

HAS THE VESSEL BEEN INSPECTED BY THE USCG WITHIN THE LAST 12 MONTHS?
[✓] YES [ ] NO
If yes, please attach a copy of the USCG "Commercial Fishing Vessel Safety Examination" letter with your bid. on board, Vessel is currently salmon tendering (we have Coast Guard's Sticker)

SURVIVAL EQUIPMENT: The State requires that the life rafts carried aboard the vessel be USCG approved. The rated capacity of the life rafts must be adequate to accommodate all of the people aboard the vessel. In addition to the life rafts, survival suits are required for all of the people aboard the vessel, this includes the State biological crew, the vessel Captain, and the vessel crew members.

Bidders must provide life rafts to accommodate all of the people aboard the vessel. Indicate the brand, capacity, and USCG approval number for the life raft you will carry aboard the vessel.

STATE OF ALASKA ITB # 2056
KING CRAB VESSEL CHARTER IN ST. MATTHEW SECTION OF THE BERING SEA

RAFT BRAND	CAPACITY	USCG APPROVAL NUMBER
EXAMPLE: *Beaufort*	*8*	*160.051/126/0*
A. Viking	10	DR USCG H051088
B.		
C.		

Bidders must provide at least enough survival suits for all those on board. Indicate the brand and model of survival suits you will carry aboard the vessel.

SURVIVAL SUIT BRAND / MODEL	NUMBER OF SUITS
A.	8
B.	
C.	

Will advise as to Brand name. There are ample suits on board. Vessel is tendering Can't contact them

Failure to specify survival suits and USCG approved life rafts to accommodate all those on board will cause the State to declare the bidder nonresponsive and to reject the bid.

Is all of the equipment called for in this ITB installed and functional on the date of bid opening?

[✓] YES [ ] NO

If "NO", indicate exceptions which will be corrected prior to the date set for the inspection by the State:

_____

_____

_____

BIDDER'S NOTE: All of the equipment called for in this ITB must be installed and functional at the time of the vessel inspection.

USCG LICENSE: In the space provided, bidder's must enter the name of the person who will serve as Captain of the vessel. The Captain must be properly licensed by the USCG for the size/type vessel being offered. A photo copy of that person's USCG license should be submitted with the bid and must be submitted within 10 days of the State's request. A bidder's failure to provide a copy of the license, as stated above, may cause the State to consider the offer nonresponsive and reject the bid.

STATE OF ALASKA ITB # 2056
KING CRAB VESSEL CHARTER IN ST. MATTHEW SECTION OF THE BERING SEA

If during the term of the contract, a different person is retained as Captain, a photo copy of that person's license must be submitted to the Contracting Officer prior to the time the person begins working as vessel Captain. The Contracting Officer must accept and authorize the change of Captains. The contractor's failure to follow this procedure may cause the State to terminate the contract.

On the line below, print the name of the person who will serve as Captain.

GretAR GuOmundSSON
VESSEL CAPTAIN

Identify the rating held by the person named above.

[ ]	Operator of Uninspected Six Passenger Vessels		
[ ]	Master, 25 Ton Vessels	[ ] Inland	[ ] Near Coastal
[ ]	Master, 50 Ton Vessels	[ ] Inland	[ ] Near Coastal
[ ]	Master, 100 Ton Vessels	[ ] Inland	[ ] Near Coastal
[ ]	Master, 150 Ton Vessels	[ ] Inland	[ ] Near Coastal
[ ]	Master, 200 Ton Vessels	[ ] Inland	[ ] Near Coastal
[ ]	Master, 500 Ton Vessels	[ ] Inland	[ ] Near Coastal
[X]	Master, 1600 Ton Vessels	[ ] Inland	[X] Near Coastal

CREW REQUIREMENTS: At a minimum, the vessel crew will consist of a Captain and three (3) crew members. The contractor will be responsible for payment of wages, direct cost of employment and fringe benefits, if any, to the vessel crew members. The State will be responsible for payment of the daily charter rate only and will not reimburse the contractor for crew wages in addition to the charter rate.

CAPTAIN AND CREW EXPERIENCE INFORMATION: Bidders must complete the Captain and crew information form below. Bidders failure to complete the Captain and crew information may cause the State to reject the bid as nonresponsive.

CAPTAIN EXPERIENCE REQUIREMENTS: The vessel Captain must have a minimum of five (5) years experience in crab-pot fishing operating in Alaskan waters. Captain must have a minimum of one (1) year experience, as a Captain, in the type and size vessel specified for this contract.

- Captain's experience operating in Alaskan waters. 12 years.
- Captain's experience, as a Captain, in various size, type/class vessels.

  a) Size type/class of vessel: crabbers > 110'.

  Number of years experience in this size type/class of vessel: 10 years.

  b) Size type/class of vessel: crabbers/draggers 130'.

  Number of years experience in this size type/class of vessel: 1 years.

STATE OF ALASKA ITB # 2056
KING CRAB VESSEL CHARTER IN ST. MATTHEW SECTION OF THE BERING SEA

c) Size type/class of vessel:_____.

Number of years experience in this size type/class of vessel:_____years.

d) Size type/class of vessel:_____.

Number of years experience in this size type/class of vessel:_____years.

CREW EXPERIENCE REQUIREMENTS:

1. ENGINEER

One of the crew must be an engineer. The engineer must have a minimum of five (5) years experience as an engineer in the type and size vessel specified for this contract.

(•) Engineer's experience, as an engineer, in various size, type/class vessels.

See Attachment I

a) Size type/class of vessel: We will use our regular engineer or We will hire a licensed engineer for the Charter through an agency if we receive this charter

Number of years experience in this size type/class of vessel:_____years.

b) Size type/class of vessel:_____.

Number of years experience in this size type/class of vessel:_____years.

c) Size type/class of vessel:_____.

Number of years experience in this size type/class of vessel:_____years.

d) Size type/class of vessel:_____.

Number of years experience in this size type/class of vessel:_____years.

2. REMAINING CREW MEMBERS

The remaining crew members must have a minimum of one (1) year experience fishing at sea.

a) First crew member's experience fishing at sea: 7 years

b) Second crew member's experience fishing at sea: 7 years

STATE OF ALASKA MODIFIED ITB #2056 (RAP #77-JP-001-95)
KING CRAB VESSEL CHARTER IN ST. MATTHEW SECTION OF THE BERING SEA

METHOD OF AWARD:

Award will be made to the lowest, most responsive bidder. Responsiveness will be determined based on the ability of bidder to meet all requirements. Preference may be given to vessels that are a minimum of 100 feet in overall length, with a minimum cruising speed of 9 knots in reasonable seas.

BID SCHEDULE

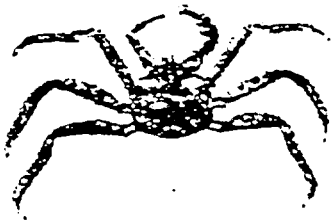
VESSEL NAME Notorious

CONTRACT RATE PER DAY $ 2500.00 x 21 DAYS = $ $52,500.00 TOTAL BID PRICE

FOR STATE USE ONLY: This covers PR # 11-001-96

Appendix H.1.

COMMERCIAL FISHERIES



NEWS RELEASE

ALASKA DEPARTMENT
OF FISH & GAME

STATE OF ALASKA
Department of Fish and Game
Frank Rue, Commissioner

Westward Region
211 Mission Road
Kodiak, AK 99615

Robert C. Clasby, Director
Commercial Fisheries Management
and Development Division

Contact: Leslie Watson/Donn Tracy
Bering Sea Shellfish
Research Biologist
486-1854

IMMEDIATE RELEASE

Date: May 11, 1995

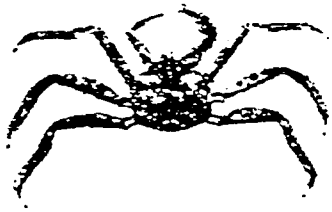
ATTENTION ALL BERING SEA KING CRAB PROCESSORS

The Alaska Department of Fish and Game is planning an intensive tagging program on St. Matthew blue king crabs during August and September 1995. Tag recovery data will be gathered to make post-season estimates of the exploitation rate in the commercial blue king crab fishery. Tag recovery information will not be used in-season to determine the harvest.

Tag recovery efforts will commence during the anticipated 1995 commercial fishery and will involve recovery of two tag types. Legal male blue king crabs will be tagged with either a traditional 'spaghetti' tag OR with a Passive Integrated Transponder (PIT) tag. PIT tags are small, glass-encapsulated devices measuring 2 mm in diameter and 11 mm in length. The tag, when energized by an external low-frequency power source, transmits a unique code to a receiver where the code is read and stored. The PIT tag is injected in the small appendage attached to the tail section (abdomen) of the crab. Studies of PIT-tagged red king crabs have conclusively shown that PIT tags remain in the appendage of the tail section and do not migrate from the injection site. Recovery of PIT tags from legal male blue king crabs will involve collection of tail sections from butchered crabs.

The cooperation of the processing industry in obtaining tail sections from landed crabs will be vital. Within the next several weeks ADF&G personnel will contact each processor (shore-based, catcher-processor and floating processor) to explain project details and make arrangements for collection of tail sections. For more information, please call Leslie Watson or Donn Tracy at ADF&G in Kodiak, 486-1854.

COMMERCIAL FISHERIES



NEWS RELEASE

ALASKA DEPARTMENT
OF FISH & GAME

STATE OF ALASKA
Department of Fish and Game
Frank Rue, Commissioner

Robert C. Clasby, Director
Commercial Fisheries Management
and Development Division

Westward Region
211 Mission Road
Kodiak, AK 99615

Contact: Donn Tracy/Leslie Watson/
Doug Pengilly
Fishery Biologist
Westward Region

IMMEDIATE RELEASE

Date: August 25, 1995

ATTENTION ALL ST. MATTHEW BLUE KING CRAB FISHERMEN

The Alaska Department of Fish and Game (ADF&G) is asking for your help in the recovery of tagged blue king crab during the 1995 St. Matthew Is. commercial fishery. A tagging survey of a portion of the St. Matthew Is. blue king crab population was conducted by the department in August, 1995. Approximately 2,300 legal male blue king crabs and 450 female blue king crabs were tagged using yellow spaghetti tags during the 3 week survey. Recovery and documentation of re-captured tagged male and female blue king crabs from the commercial fishery will provide additional information on population size and distribution of the stock.

The ADF&G crab tag is yellow with an orange tab which says "LEAVE TAG ON CRAB - NOTIFY ADF&G" and the TAG LETTER "A" followed by a 5-digit tag number. The Department is requesting that all captains and crewmembers who catch tagged crabs do the following:

1. **Record captain's name, vessel name, target fishery, tag letter and tag number, fate and legal status of the crab (if male), capture date and location on the attached form as instructed below.**

2. **For catcher-processors,** the observer will remove tags from legal males, record capture and reward data and return crab to the processing area. Female crabs should also be given to the observer to measure and record; these animals will be released live, with their tags left on, as soon as possible.

3. **For catcher-only vessels,** leave the tag on recaptured legal males and record the requested information as in (1) above. Contact the observer or ADF&G sampler upon delivery so that the crab can be measured and the capture and reward information can be recorded. Release all tagged female crabs live, **with their tags left on,** after recording the capture data on the attached form.

4. **Forward all tags and tagged crab recapture information not collected by observers or ADF&G personnel to the Dutch Harbor or Kodiak ADF&G office. Captains will receive original tagging data for each tagged crab they document. Rewards will be issued on a lottery basis for persons who return tags with capture information from legal crabs or document returns of female crabs. Please complete the tag reward information section of the attached from to assure your participation in the tag reward program.**

Thank you for your assistance in this program.

ADF&G WESTWARD REGION CRAB TAG RECOVERY FORM

CAPTAIN'S NAME _____ VESSEL NAME _____

SPECIES _____ SEX _____ REGISTRATION AREA _____

TARGET FISHERY _____

CAPTURE INFORMATION:

	TAG LETTER	TAG NUMBER						FATE	LEGAL?	CAPTURE DATE			CAPTURE LOCATION		DEPTH (fm)			STATISTICAL AREA					
										mo	day	yr	N. LATITUDE	W. LONGITUDE									
1																							
2																							
3																							
4																							
5																							
6																							
7																							

FATE: 1=DEAD (RETAINED FOR SALE); 2=RELEASED ALIVE LEGAL? LEGAL=1; SUBLEGAL=2

TAG REWARD INFORMATION:

	NAME	ADDRESS	PHONE NUMBER
1			
2			
3			
4			
5			
6			
7			

RETURN TAGS AND FORM TO:

LESLIE WATSON
211 MISSION ROAD
KODIAK, AK 99615
(907)486–1854

OR

DONN TRACY
BOX 308
DUTCH HARBOR, AK 99692
(907)581–1239

Appendix H.3. 1995 ST. MATTHEW BLUE KING CRAB TAG RECOVERY INSTRUCTIONS FOR DOCKSIDE SAMPLERS

Introduction

ADF&G has recently completed a 21-day tagging survey of a portion of the St. Matthew Island blue king crab stock. Approximately 2,300 legal male blue king crabs and 450 female blue king crabs were tagged using polyvinyl isthmus tags (Floy tags) during August 1995. In tandem with designated tag samplers, dockside samplers play a vital role in retrieval of tags and tag recovery information during the skipper interview and catch sampling programs.

Tag Description

The tags are yellow with orange tabs and are identical to tag styles used in previous Bristol bay red king crab tagging studies. The yellow tubing has the tag series "A" followed by the tag number (5 digits) printed on it. The orange tab has "LEAVE TAG ON CRAB-NOTIFY ADF&G" and the tag letter "A" followed by the 5-digit tag number.

General Instructions

A news release was issued to St. Matthew fishermen requesting their help in recovering tagged crabs, including specific instructions on completing tag recovery forms at sea, how to handle female crabs, and the tag reward program (Appendix H.2). All tag recoveries collected by dockside samplers should be fully documented as shown on the sample form (Appendix H.X). All tags and tag recovery forms, including tag recovery forms from vessel captains, should be returned to ADF&G in Dutch Harbor at the end of each sampler's shift. Designated tag samplers from Shellfish Research will be in Dutch Harbor and St. Paul to document tag recoveries and are expected to cover most of the deliveries. However, dockside samplers should ask vessel captains and crews if they have any tagged crabs aboard and if they have tag recovery information for any tagged crabs they may have caught and released. Please collect this information during your interview; if time allows, you may sample any tagged crabs that are presented to you. If you cannot sample the crab or collect the information, please notify a designated tag sampler as soon as possible so that we don't 'lose' this data. Coordination of tag recovery efforts between dockside samplers and designated tag samplers will be established prior to the announced closure of the season.

Tagged legal male blue king crabs will be returned to the processing line after all required data is recorded and the tag is removed.

Tagged female blue king crabs will be fully sampled, the tag removed and placed in the vessel's dead loss pile; do not throw live females over the side during sampling.

-Continued-

Tag Reward Program

For each tag recovery, we need to identify persons who found the tag or tagged crab or who turned in recovery information for the tag reward program. Tags and tagged crabs may come from vessel crews, captains, or processing workers whereas recovery information usually comes from the captain.

INSTRUCTIONS FOR CRAB TAG RECOVERY FORM

SIDE 1: Tag Recovery Information

SPECIES: Blue king crab

FISHERY: St. Matthew

SAMPLER: First and last name

FLOY TAG SERIES & NUMBER: For St. Matthew, all tags will have the tag series "A" followed by a 5-digit number; record both the tag series and number.

SIZE: Record the carapace length, in millimeters.

LEGAL: Identify measured male crabs as either 1=sub-legal or 2=legal

SEX: 1=male; 2=female

SHELL AGE: 0=soft; 1=new; 2=old; 3=very old

FATE: Fate of sampled crab. 1=Retained for sale; 2=Released alive; 3=Dead(not retained for sale; e.g. found in dead loss pile or frozen for ADF&G or Observer sampling, etc)

CAPTURE DATE: Use month-day-year format

CAPTURE LOCATION: Latitude and longitude information from captain, in degrees and minutes, with minutes to the hundredths (convert seconds to hundredths of minutes). If no information available, write "n/a" across the lat/long columns.

DEPTH: In fathoms only (1 fm=6 ft)

STATISTICAL AREA: Determine from statistical charts. If lat/long are not known; but capture location has been identified by the captain as a particular statistical area, record that statarea number. If no information available, write "n/a" across the statarea columns.

ADF&G VESSEL NUMBER: Write the ADF&G number of the vessel that landed the tagged crab.

-Continued-

RECEIVED TAG OR TAGGED CRAB FROM: Record full name, address and phone number

RECEIVED RECOVERY LOCATION DATA FROM: Record full name, address and phone number

VESSEL NAME: Name of the vessel that landed the tagged crab

PROCESSOR NAME: Name of the processor that the tagged crab was landed at

SAMPLING DATE: Date that the tag or tagged crab was received/sampled.

SIDE 2: Female Reproductive Data and Comments Section

This side of the tag recovery form is used to record female reproductive data and comments on tagged male and female crabs. Although fishermen have been instructed not to retain tagged female blue king crabs, it is expected that some will show up at the dock. Refer to codes on the bottom of the form for appropriate assignment of egg color and development, clutch condition and percent clutch, and other conditions not covered elsewhere (disease/parasite).

Appendix H.4. 1995 ST. MATTHEW BLUE KING CRAB TAG RECOVERY INSTRUCTIONS FOR SHELLFISH OBSERVERS

Introduction

ADF&G has recently completed a 21-day tagging survey of a portion of the St. Matthew Island blue king crab stock. Approximately 2,300 legal male blue king crabs and 450 female blue king crabs were tagged using polyvinyl isthmus tags (Floy tags) during August 1995. The role of onboard observers in the recovery of externally-marked kings crabs from previous Bristol Bay red king crab tagging surveys has been quite substantial. Onboard observers provide a unique opportunity for collection of tagged crabs directly from the commercial fishery; moreover, observers can identify recaptured tagged crabs from known geographical locations when bycatch sampling is done (see Bycatch sampling instructions in current issue of ADF&G Shellfish observer field manual).

Tag Description

The tags are yellow with orange tabs and are identical to tag styles used in previous Bristol bay red king crab tagging studies. The yellow tubing has the tag series "A" followed by the tag number (5 digits) printed on it. The orange tab has "LEAVE TAG ON CRAB-NOTIFY ADF&G" and the tag letter "A" followed by the 5-digit tag number.

General Instructions

A news release was issued to St. Matthew fishermen requesting their help in recovering tagged crabs, including specific instructions on completing tag recovery forms at sea, how to handle female crabs, and the tag reward program (Figure 1). Floating processor observers should ask for tags and forms from catcher vessels delivering to their processor. Catcher-processor observers should inform the captain, crew and processing crews to be on the look-out for tagged crabs and to contact the observer for sampling.

All tag recoveries collected by observers should be fully documented as shown on the attached 2-page sample form (Figure 2). All tags and tag recovery forms, including tag recovery forms from vessel captains, should be returned to ADF&G in Dutch Harbor at the time of your debriefing.

> ***Tagged legal male blue king crabs*** will be returned to the processing line after all required data is recorded and the tag is removed.
>
> ***Tagged female blue king crabs*** will be sampled gently and returned to the sea soon as possible with the tag left on the crab. If the tag is pulled out, the crab will bleed and die. We are hoping to get recapture information on females during successive fisheries as seasonal movement and reproductive habits of these crabs are poorly known.

-Continued-

Tag Reward Program

For each tag recovery, we need to identify persons who found the tag or tagged crab or who turned in recovery information for the tag reward program. Tags and tagged crabs may come from observer, vessel crews, captains, or processing workers whereas recovery information may come from observers or the captain. Observers are not eligible for tag rewards; please credit tag returns appropriately.

INSTRUCTIONS FOR OBSERVER CRAB TAG RECOVERY FORM

SIDE 1: Tag Recovery Information

SPECIES: Blue king crab

FISHERY CODE: Four character code provided by ADF&G at briefing; use only one fishery code

OBSERVER: First and last name

SEQUENTIAL POT NUMBER: Record the sequential pot number when tagged crabs are recovered from pots selected for Bycatch sampling (see Observer Manual). ***If tagged crabs are found within the 600-crab Legal tally, note this in the comments section on the reverse side of the form.***

FLOY TAG SERIES & NUMBER: For St. Matthew, all tags will have the tag series "A" followed by a 5-digit number; record both the tag series and number.

SIZE: Record the carapace length, in millimeters.

LEGAL: Identify measured crabs as either 1=sub-legal or 2=legal

SEX: 1=male; 2=female

SHELL AGE: 0=soft; 1=new; 2=old; 3=very old

FATE: Fate of sampled crab. 1=Retained for sale; 2=Released alive; 3=Dead(not retained for sale; e.g. found in dead loss pile or frozen for ADF&G or Observer sampling, etc.

CAPTURE DATE: Use month-day-year format

CAPTURE LOCATION: Latitude and longitude information from captain or Bycatch pot position, in degrees and minutes, with minutes to the hundredths (convert seconds to hundredths of minutes). If no information available, write "n/a" across the lat/long columns.

-Continued-

DEPTH: In fathoms only (1 fm=6 ft)

STATISTICAL AREA: Determine from statistical charts issued during briefing. If lat/long are not known; but capture location has been identified by the captain as a particular statistical area, record that statarea number. If no information available, write "n/a" across the statarea columns.

ADF&G VESSEL NUMBER: ***For catcher-processors***, write the ADF&G number of the vessel to which you have been assigned. ***For floating processors***, write the ADF&G number of the vessel that landed the tagged crab.

RECEIVED TAG OR TAGGED CRAB FROM: Record full name, address and phone number

RECEIVED RECOVERY LOCATION DATA FROM: Record full name, address and phone number

VESSEL NAME: Name of the vessel that landed the tagged crab

PROCESSOR NAME: Name of the processor that the tagged crab was landed at

SAMPLING DATE: Date that the tag or tagged crab was received/sampled.

SIDE 2: Female Reproductive Data and Comments Section

This side of the tag recovery form is used to record female reproductive data and comments on tagged male and female crabs. Refer to codes on the bottom of the form for appropriate assignment of egg color and development, clutch condition and percent clutch, and other conditions not covered elsewhere (disease/parasite). Note that the clutch condition, percent clutch and 'other' categories are somewhat different from the format used for the same information on the Crab and Fish Measurement Form (see Observer Manual appendix). If tagged crabs are found within the 600-crab Legal tally, them as "found in legal tally" in the Comments section of the tag recovery form. All capture information will be noted as previously described.

1995 ST. MATTHEW BLUE KING CRAB
PIT-TAGGED CRAB TAIL (ABDOMEN) COLLECTION PROCEDURES
FOR SHELLFISH OBSERVERS ON CATCHER-PROCESSORS ONLY

Introduction

During the 21-day tagging survey conducted in August 1995, two tag types were applied to legal male blue king crabs in a portion of the St. Matthew Island stock; external Floy tags and internal Passive Integrated Transponder (PIT) tags. Crabs were marked with only one tag type; e.g., there

-Continued-

are no crabs bearing both a Floy tag AND a PIT tag. Instructions for recovery of Floy tags by shellfish observers is covered in a separate packet.

Approximately 1,200 legal male blue king crabs were tagged using PIT tags. The small (12 mm) electronic tag was injected into the small leg attached to the tail section (abdomen) of the crab and is not visible externally. Collection of tail sections from catcher-processors through the shellfish observer program will result in a companion data set for collections made in Dutch Harbor. Catcher-processors from the 1994 fishery were contacted regarding their ability and willingness to provide tail sections for collection by observers; once the catcher-processors have been identified for the 1995 fishery, they will be canvassed and reminded that ADF&G is going forward with tail collection plans.

Instructions

A minimum collection goal of 400 crab tail sections per day is desired; 200 crab tail sections in each of two boxes (estimated that 200 tail sections will fit in a 50 lb. capacity wax box). However, as long as each tail section collection is properly logged and labeled (see below), use of smaller or larger boxes is acceptable. If it is not feasible to collect 400 tail sections every day, a minimum of 200 per day is acceptable. Collect the tails as the opportunity arises; you may collect more than 400 per day if feasible. Boxes of tails should be frozen and kept in a safe place, preferably away from boxed product so that they are not accidentally shipped out.

Each collected tail section must be intact, with both the left and the right, small legs attached as shown in Figure 1. Tail sections can be collected at or near the butcher station and will probably be attached to the carapace. If so, detach the carapace (you don't need to measure it). If you have to cut tails sections off whole crabs, do so just prior to butchering. Place the crab on it's back and slice the isthmus muscle at the point closest to the body of the crab, being careful not to cut off the little legs. Discard the hepatopancreas (slimy yellow material).

Logging Collected Tail Sections. Complete the Tail Section Collection Log (Figure 2) each time you fill a box with tail sections.

Labeling Boxes. Label each box with the labels provided by ADF&G (Figure 3) or, using a waterproof marker label each box with the required information.

At the time of your debriefing, turn in any tail collection logs to the ADF&G debriefer. ADF&G will pick up the boxes at the catcher-processor.

Appendix H.5 (Page 1 of 5)

1995 St. Matthew Blue
King Crab Abdomen Collection Log for
Shellfish Observers on Catcher-Processors

Catcher-Processor: _____ ADF&G No._____
Observer: _____

Box	Date and Time	No. of Tails in Box	Comments

ADF&G WESTWARD REGION CRAB TAG RECOVERY FORM

SPECIES _____ FISHERY _____ SAMPLER _____

	FLOY TAG SERIES & NUMBER	SIZE (mm CL)	LEGAL /a	SEX /b	SHELL /c	FATE /d	CAPTURE DATE Mo.	Day	Yr.	CAPTURE LOCATION N. LATITUDE	W. LONGITUDE	DEPTH (fm)	STATISTICAL AREA	ADF&G VESSEL NO.
1										.	.			
2										.	.			
3										.	.			
4										.	.			
5										.	.			

/a LEGAL: 1=Sublegal; 2=Legal. /b SEX: 1=Male; 2=Female. /c SHELL AGE: 0=Soft; 1=New; 2=Old; 3=Very Old. /d FATE: 1=Dead; 2=Released alive; 3=Dead (not retained for sale; e.g., found in deadloss pile or frozen for ADF&G or Observer sampling, etc.)

NOTE: If female crab; record additional information on the back of this form. Record comments for captured male and female crabs on the back of this form.

	Received Tag or Tagged Crab From: Name, Address & Phone	Received Recovery Location Data From: Name, Address & Phone	Vessel Name	Processor Name	Sampling Date Mo.	Day	Year
1							
2							
3							
4							
5							

Edited by: Date: Entered by: Date:

SMTRFM95.WQ1 8/95 ljw

ADF&G WESTWARD REGION CRAB TAG RECOVERY FORM
(REVERSE SIDE)

*	EGGS				OTHER		COMMENTS
	COLOR	DEVELOP	CONDITION	% CLUTCH			
1							
2							
3							
4							
5							

LIVE EGG COLOR
1-Tan
2-Purple
3-Brown
4-Orange
5-Purple-brown
6-Pink
7-Reddish
0-Other; describe in Comments.

EGG DEVELOPMENT
1-Uneyed
2-Eyed

CLUTCH CONDITION
1-Dead eggs not apparent
2-Dead eggs <20 %
3-Dead eggs >20 %.

PERCENT CLUTCH
1-Barren,clean pleopods
2-Barren,with empty egg cases and/or stalks
3-Clutch 1-29% full
4-Clutch 30-59% full
5-Clutch 60-89% full
6-Clutch 90-100% full

OTHER
3-Nemerteans in clutch
4-Turbellarians in clutch
5-Black mat syndrome
6-Bitter crab disease
7-"Cottage cheese" disease
8-Shell rust
9-B. callosus

FEMTAGFM.WQ1 8/95 ljw

ADF&G WESTWARD REGION OBSERVER CRAB TAG RECOVERY FORM

SPECIES _____ FISHERY CODE _____ OBSERVER _____

	SEQ. POT NO.	FLOY TAG SERIES & NUMBER	SIZE (mm CL)	LEGAL /a	SEX /b	SHELL /c	FATE /d	CAPTURE DATE Mo.	Day	Yr.	CAPTURE LOCATION N. LATITUDE	W. LONGITUDE	DEPTH (fm)	STATISTICAL AREA	ADF&G VESSEL NO.
1											.	.			
2											.	.			
3											.	.			
4											.	.			
5											.	.			

/a LEGAL: 1=Sublegal; 2=Legal. /b SEX: 1=Male; 2=Female. /c SHELL AGE: 0=Soft; 1=New; 2=Old; 3=Very Old. /d FATE: 1=Retained for sale; 2=Released alive; 3=Dead(not retained for sale; e.g. found in deadloss pile or frozen for ADF&G or Observer sampling, etc.)

NOTE: If female crab; record additional information on the back of this form. Record comments for captured male and female crabs on the back of this form.

	Received Tag or Tagged Crab From: Name, Address & Phone	Received Recovery Location Data From: Name, Address & Phone	Vessel Name	Processor Name	Sampling Date Mo.	Day	Year
1							
2							
3							
4							
5							

Edited by: Date: Entered by: Date:

OBSTAGFM.WQ1 8/95 llw

ADF&G WESTWARD REGION CRAB TAG RECOVERY FORM
(REVERSE SIDE)

*	EGGS				OTHER		COMMENTS
	COLOR	DEVELOP	CONDITION	% CLUTCH			
1							
2							
3							
4							
5							

LIVE EGG COLOR

1-Tan
2-Purple
3-Brown
4-Orange
5-Purple-brown
6-Pink
7-Reddish
0-Other; describe in Comments.

EGG DEVELOPMENT

1-Uneyed
2-Eyed

CLUTCH CONDITION

1-Dead eggs not apparent
2-Dead eggs <20 %
3-Dead eggs >20 %.

PERCENT CLUTCH

1-Barren,clean pleopods
2-Barren,with empty egg cases and/or stalks
3-Clutch 1-29% full
4-Clutch 30-59% full
5-Clutch 60-89% full
6-Clutch 90-100% full

OTHER

3-Nemerteans in clutch
4-Turbellarians in clutch
5-Black mat syndrome
6-Bitter crab disease
7-"Cottage cheese" disease
8-Shell rust
9-B. callosus

FEMTAGFM.WQ1 8/95 ljw