

Regional Operational Plan No. ROP.CF.1J.2025.32

**Operational Plan: Southeast Alaska Fall Crab Pot
Survey and Tanner Crab Stock Assessment, 2024-2028**

by

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and

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June 2025

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H_A
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient	
		corporate suffixes:		(simple)	r
Weights and measures (English)		Company	Co.	covariance	cov
cubic feet per second	ft ³ /s	Corporation	Corp.	degree (angular)	°
foot	ft	Incorporated	Inc.	degrees of freedom	df
gallon	gal	Limited	Ltd.	expected value	E
inch	in	District of Columbia	D.C.	greater than	>
mile	mi	et alii (and others)	et al.	greater than or equal to	≥
nautical mile	nmi	et cetera (and so forth)	etc.	harvest per unit effort	HPUE
ounce	oz	exempli gratia	e.g.	less than	<
pound	lb	(for example)		less than or equal to	≤
quart	qt	Federal Information Code	FIC	logarithm (natural)	ln
yard	yd	id est (that is)	i.e.	logarithm (base 10)	log
		latitude or longitude	lat or long	logarithm (specify base)	log ₂ , etc.
Time and temperature		monetary symbols		minute (angular)	'
day	d	(U.S.)	\$, ¢	not significant	NS
degrees Celsius	°C	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	H_0
degrees Fahrenheit	°F	registered trademark	®	percent	%
degrees kelvin	K	trademark	™	probability	P
hour	h	United States	U.S.	probability of a type I error	
minute	min	(adjective)		(rejection of the null hypothesis when true)	α
second	s	United States of America (noun)	USA	probability of a type II error	
		U.S.C.	United States Code	(acceptance of the null hypothesis when false)	β
Physics and chemistry		U.S. state	use two-letter abbreviations (e.g., AK, WA)	second (angular)	"
all atomic symbols				standard deviation	SD
alternating current	AC			standard error	SE
ampere	A			variance	
calorie	cal			population	Var
direct current	DC			sample	var
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

REGIONAL OPERATIONAL PLAN NO. ROP.CF.1J.2025.32

**OPERATIONAL PLAN: SOUTHEAST ALASKA FALL CRAB POT
SURVEY AND TANNER CRAB STOCK ASSESSMENT, 2024-2028**

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June 2025

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SIGNATURE PAGE

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PURPOSE

The Alaska Department of Fish and Game conducts annual fall pot surveys in Southeast Alaska to assess Tanner crab health indices and calculate catch per unit of effort (CPUE) data. This information is used in Tanner crab stock assessment and is used to provide management recommendations for the commercial fishery.

Keywords: Pot survey, Tanner crab, *Chionoecetes bairdi*, abundance, bycatch, Southeast Alaska, stock assessment

OBJECTIVES

PRIMARY

1. Capture and collect biological information on Tanner crab from 4 survey areas in the central and northern portion of Southeast Alaska for model-based biomass estimation.
2. Obtain a pre-season index of legal Tanner crab pre-recruit male and female abundance and assess female reproductive status.
3. Determine if the minimum biomass threshold of mature males for a commercial fishery opening has been exceeded, and the number of fishing days that will be allowed.
4. Capture and collect biological information on other commercial crab bycatch species, such as king crab and Dungeness crab.

SECONDARY

5. Maintain long-term data set on bottom temperature (from HOBO temperature tidbits) for future climate analysis and comparisons.
6. Collect chela height ratios of male Tanner crab to estimate size at maturity.
7. Visual identification of bitter crab prevalence.

BACKGROUND

The survey is currently conducted in the central and northern portion of Southeast Alaska in 4 survey areas: Icy Strait, Thomas Bay, Holkham Bay, and Glacier Bay (Figure 1, Table 1). Previously surveyed areas included Port Camden and Stephens Passage; these areas have been excluded from the assessment since 2015.

A range of 52 to 78 pots are set in each survey area, dependent on the size of the area and time needed to set, pull, and sample pots. Catch per unit effort (CPUE) of mature male crab is incorporated into a model to produce estimates of population size for each surveyed area. Population size is estimated using a three-stage catch survey analysis model (CSA) that tracks 3 recruit categories (classified using size and shell condition; Table 2) of male crabs over the range of survey years, which in most areas began in 1997 through the present, to estimate the current abundance of mature and legal male crab in each area.

In addition to estimating abundance, other factors that contribute to the overall health of the population are examined, including CPUE of juvenile male and female crab, egg condition, clutch fullness, and size distributions. Estimates of harvestable surplus are generated for each survey area and expanded using the mean proportion of harvest occurring in the surveyed areas to produce a regional biomass estimate for mature male crab. The regional mature male biomass estimate is

compared to a regulatory threshold of 2,300,000 lb (5 AAC 35.113), which is the minimum level for the commercial fishery to open. Survey results are also used to set the season length; additional fishing days are added when the estimated biomass of mature males exceeds 5,500,000 pounds.

METHODS

SURVEY DESIGN

Southeast Alaska Tanner crab stocks are assessed using a stratified random sampling design. Four important fishing locations in Southeast Alaska are surveyed annually at the smallest tidal range in late September and October of each year. Commercially important bycatch species are counted, recorded, and returned to the sea (Table 3). All king, Tanner, and Dungeness crabs are retained for collection of biological information and then returned to the sea.

Updates to the survey design were performed prior to the 2013 survey. The survey areas were stratified based on total crab abundance from previous surveys and depth data obtained from NOAA bathymetric maps. These methods were similar to the density stratification currently in place for red king crab stock assessment survey (Clark 2008). The stratification provides 5 density strata in a design that minimizes variability within strata, providing a statistically robust estimate of CPUE for use in the CSA model; this will provide more confidence in the biomass forecasts.

Survey methods were first detailed in *Tanner crab pot survey methods for Southeast Alaska* (Bednarski et al. 2008). This Regional Operational Plan updates those methods for the 2024 through 2028 field seasons.

POT LOCATIONS

Pot locations are selected within 5 density strata through a stratified random sampling design. The number of pots within each stratum is determined using a Neyman allocation based on the variance of total crab CPUE estimates by strata using survey data from 2013 through 2015; this information is updated with new data every 3 years (Cochran 1977). The allocation was updated for the 2024 survey season, using data from 2021 to 2023; the next update is scheduled for 2028. The 2024 pot allocation was based on previous area calculations for Glacier Bay. Updating the size of the area is needed for future allocation calculations. The total number of pots within each survey area is determined based on logistics and the time that the crew can efficiently sample and set pots. Exact pot locations are determined using randomly generated locations within each stratum, with a minimum distance of 0.1 nautical miles between pots using ArcGIS (Appendices E2, F2, G2, and H2). Extra pot locations are for each area, in the event that there may be conflicts with gear from concurrent fisheries in the vicinity or if set locations are otherwise unattainable.

SETTING AND PULLING

Approximately 26 pots are deployed each day (Appendix D1); setting and hauling times will be recorded for each pot on the “Crab Pot Set Form” (Appendix B1). Pots will be set between 12:00 and 18:00 hours and pulled between 07:00 and 13:00 hours; pots are generally hauled in the same order as they are set and soak times range from 16–20 hours. Tanner crab pot soak time experiments conducted in 2004 and 2005 in Icy Strait and Excursion Inlet found no gear saturation occurring with the gear and standard soak period used in this survey (Rumble et al. 2008).

POT GEAR AND BAIT

Conical, top-loading commercial crab pots with an eighty-eight-inch diameter and closed escape rings will be used for the survey. Bio-twine (30-thread untreated cotton twine) will be laced through an 18-inch opening on a side wall of each pot. Pots will be baited with one ½ round of pink salmon and approximately 4 pounds of frozen, winter-caught Alaska bait herring (preferably caught the same year as the current survey) and chopped within 24-hours of use. Two bait containers, on opposite sides of the pot and each filled with approximately 2 pounds of chopped herring, will be used for each pot along with the one ½ round of pink salmon. The bait jars will be suspended so that the top of the bait jar is approximately the same height as the bottom of the pot cone and about halfway between the cone and the exterior webbing. The bio-twine will be replaced on all pots prior to setting gear on the first day of leg 1 of the survey in each year.

HOBO Tidbit® temperature loggers will be individually attached to a numbered buoy tag and to all pots with zip ties prior to the first set on each leg of the survey. Tidbits should be attached to pots so that the tag number is facing out and visible to crew on deck. Temperature is recorded at hourly intervals to the nearest thousandth °C. All tidbits should be removed from the pots at the time each pot comes aboard for the last time, and the information downloaded at the end of each survey leg. Temperature logger protocols are found in Appendix A.

Setting and pulling the gear is the responsibility of the vessel crew. Biologists are available to help work gear at the request of the deck supervisor.

DATA COLLECTION

Pot Condition and Substrate:

When a pot is pulled, its condition and proper fishing status will be recorded using the “Crab Specimen Form” (Appendix B2). Any evidence that the pot was on its side, mesh had holes, errors in closing the pot, and the sediment type, if any, found on the pot will be noted (Table 4). Holes or other features that would allow small crabs to escape will be repaired before the pot is used again. The contents of each pot will be carefully emptied onto a sampling table. Commercially important bycatch species (Table 3) will be counted and numbers recorded on the “Crab Survey Specimen” form (Appendix B2), then returned to the sea. All captured *Pycnopodia helianthoides* will be measured in millimeters from tip of an arm to the tip of the arm directly across and recorded, and yelloweye rockfish (*Sebastes ruberrimus*) will be returned to the water via a deepwater release mechanism to 100 ft. All king, Tanner, and Dungeness crabs will be assessed for collection of biological information before being returned to the sea.

Biological Information:

The carapace width (CW) of Tanner and Dungeness crabs and the carapace length (CL) of all king crab will be measured with Vernier calipers to the nearest millimeter, using the standard biological measurement for that species (Figure 2). Shell condition of crabs will also be assessed (Table 2).

All legal and pre-recruit sized Tanner crab will be measured and should be made priority above all other size/sex class and species.

If there are pots with high numbers of crab, a maximum of approximately 100 crab (50 minimum for male crab) should be sampled. If there is high variability in clutch size, as many females as

possible will be sampled. The scientific lead on each leg will determine if and at what rate to sub-sample using the following criteria:

- subsampling can occur by species and sex at a rate not to exceed 1:15, preferably from 1:2–1:5;
- male Tanner crab should be sampled 1:1;
- female Tanner crab will be sub-sampled first, please note that every effort must be made to separate juvenile females and mature females prior to subsampling, and to subsample individuals of similar sizes as this could affect analyses;
- small male Tanner crab will be sub-sampled second.

For each crab, abnormalities in the carapace will be noted (Table 5). As of 2023, leg condition will no longer be gathered. The presence of any parasites or diseases, such as black mat or bitter crab syndrome, will be noted (Table 6, Figure 4).

For all female crabs, the percent clutch fullness will be estimated in 10% increments, and the development and condition of the eggs will be noted (Table 7).

Chela heights of adult Tanner crab will be measured to monitor any changes in the size at functional maturity (point when mature males are “large clawed”). For each survey area, a total of 150 male Tanner crab are randomly sampled until target numbers are achieved within each of 6 size groups and measured for biological carapace width (to the nearest 1 mm) and right_chela height, (also to the nearest 1 mm) using Vernier calipers (Jadamec et al. 1999; Table 8, Figure 3, Appendix B3).

Individual crab weights, for use in the length-weight relationship for each area, were last measured in 2010 and will not be measured to increase sampling efficiency.

DATA INTEGRITY

Data will be recorded on standard data sheets (Appendix B2) and entered into the Zander database onboard the vessel by the biological survey staff. Once the data is entered, datasheets are marked with initials of the person entering the data (entered by: initials). The database is then re-checked against the datasheets for errors, preferably by a different biological staff, and datasheets are marked with initials of the person verifying the data (verified by: initials). This should be completed prior to disembarking from the vessel to ensure a time efficient analysis of the data. All data are housed in OceanAK, a relational database available via intranet to ADF&G researchers and managers statewide (subject area: Region 1–Invertebrates–Surveys–Crab). Raw datasheets are archived.

LOST POT PROTOCOL

If a pot is lost (buoy is not visible); a retrieval pot (with biotwine cut, escape rings opened, and tidbit removed) will be set next to the lost pot with a pot saver (an upside-down grappling hook that is attached to and slides onto the floating line) attached just above the bridle. Extra line should be placed on the retrieval pot, depending on depth, to allow the vessel to circle the lost pot a minimum of 4 times adequately. The line from the retrieval pot should be left in the block and tied off to a cleat until four rotations are complete before the retrieval pot is hauled. The skipper should make every attempt to keep the line at ninety degrees to the boat. This process should be repeated a second time if the pot is not retrieved on the first attempt if time allows.

VOLUNTEERS

Occasionally, volunteers such as graduate students or National Parks Service employees join the crew for a portion of a fall crab survey leg. They typically help with gear work and/or sorting crab species once they have been briefed by both the boat and scientific crew. Prior to boarding the R/V *Medeia*, all volunteers must be approved by the crab group staff and complete the “Volunteer Agreement” form (Appendix B4).

VESSEL

The State of Alaska owned research vessel, R/V *Medeia*, is used to conduct the annual fall crab survey. This 110-foot vessel was built in 1982 of iron, steel, and alloy, and has a net capacity of 246 tons. It currently resides at Harris Harbor in Juneau, Alaska. The vessel crew consists of 4 positions: Boat Officer IV, Boat Officer III, Boat Officer II, and Boat Officer I.

DATA ANALYSIS

All data are entered in Zander and stored in OceanAK, ADF&G’s database. Data analyses are done using the most updated version of R¹. After the completion of each survey area, the data from the survey area is uploaded and stored into OceanAK

SURVEY CATCH PER UNIT OF EFFORT

Data, including sex and size, is collected for all Tanner crab in each pot. Based on the sex and size designations, crab are classified into recruit classes. Males are classified based on size and shell conditions according to Table 2. Females are classified as either large and mature or small and immature based on both size and presence of physical maturity (Donaldson and Byersdorfer 2005). CPUE is summarized for each recruit class in each pot, with the goal of calculating a stratified weighted average CPUE for each survey area. Only pots that are classified as “normal” are included in this analysis. Abnormal pots are removed to prevent bias (refer to Table 4 for abnormal pots designations).

Due to the stratified design of the survey, the average CPUE for each area must be calculated as a weighted average, including both the number of pots sampled in each strata and the area of each strata. Catch in each pot is weighted by a multiplier of the area of each strata divided by the number of pots sampled in that strata in the current year. Once each pot’s catch is weighted, an average CPUE for each recruit class is computed for each survey area. Weighting the CPUE is essential due to the stratified design of the survey and differential sample size in each stratum.

STOCK HEALTH DETERMINATION

Historically, the weighted CPUEs and survey data calculated for each recruit class have been used to help determine the overall stock health for each survey area. This is accomplished by comparing the current year’s data to long-term and short-term indicators (Siddon et al. 2009). This method for evaluating stock health is repeatable and objective; additionally, it has been used for other crab and invertebrate species in Southeast Alaska. The following metrics are examined to evaluate stock health: mature female clutch fullness and catch rate, pre-recruit CPUE, recruit CPUE, and post-recruit CPUE.

¹ The R project for statistical computing. Version 4.5.0. Vienna, Austria. <https://www.R-project.org/> (accessed April 14, 2025).

All the metrics, except mature female clutch fullness, are calculated using weighted CPUE from the survey. For the long-term trends, the current year's metric is compared, using a t-test, to the long-term mean calculated from baseline years (1997–2006). This specific time-period, from 1997–2006, was established in 2007 as the first 10 years of survey data. In the future, this year's range should be evaluated to ensure that it encompasses a range of population levels. If the current year is significantly above the long-term mean, it is scored +1; if it is not different from the mean, it is scored 0; and if it is significantly lower than the mean, it is scored -1. The short-term trends are examined by performing a linear regression on the last four years of data for each metric. The significance of these regressions is then scored similarly to the long-term trends, with a positive trend having a score of 0.25, no trend having a score of 0, and a negative trend having a score of -0.25. The area scores sums all the long-term and short-term scores for each metric into one score for each area. Scores less -3.25 are considered poor, between -3.25 and -1.26 below average, between -1.25 and 1.25 moderate, between 1.26 and 3.25 above average, and above 3.25 healthy.

Mature female clutch fullness is evaluated differently by calculating the mean proportion of mature females in each pot with a clutch fullness of < 25% (i.e. very small clutches). The level allows for biologist error in assessing clutch fullness to the nearest 10 % on the survey, low clutches (<25%) are usually noticeably low.

STOCK ASSESSMENT

Tanner crab biomass, both mature and legal, is estimated using a CSA model that relies on inputs from both the survey and the fishery (in years when the fishery was open).

Model inputs

Inputs from the survey data include: weighted CPUE of pre-recruit, recruit, and post-recruits by survey area, mid-date for the survey, and average weight (using the established length-weight relationships) of pre-recruit, recruit, and post-recruits. The mid-date for the survey is the middle date for the pots set in each survey area. If the area is surveyed, an even number of days the date used would be the first day of the second half of the survey for that area. For example, if an area were surveyed for 4 days, the date used would be the third day of the survey.

The average weight of male crab in each survey year is calculated from the length composition collected on the survey using a survey area specific length-weight relationship. These relationships were established from survey data (1997–2007). A summary of the relationships for each area is provided in Table 9.

Inputs from the fishery include catch in numbers and the mid-date of the fishery, both of which are obtained from the commercial fish ticket database. The mid-date for the fishery is computed as the sum of the days in the season, the ratio of the catch for that day, divided by the total catch for the area and season (Clark et al. 2003).

The model

A CSA model is used to estimate mature and legal abundance of Tanner crab for each of the surveyed areas. This analysis type was initially developed by Collie and Sissenwine (1983) and adapted for crab abundance estimation in the 1990s (Kruse and Collie 1991; Zheng et al. 1997; Collie and Kruse 1998). Starting in 2007, a three-stage model was used to estimate abundance of Tanner crab in Southeast Alaska, using pre-recruits, recruits, and post-recruits (Zheng et al. 2007).

This type of model estimates the abundance of a population by comparing the changes in survey catches to the number of crabs removed by the commercial and personal use effort. In a three-stage model pre-recruits are estimated every year and recruits are related to the number of pre-recruits that survive and molt to become recruits (Eq. 1). Post-recruits are estimated from the recruits and post-recruits in the previous year and the fishery removals that occur between the survey years (Eq. 2). Errors are associated with both survey and fishery catch and are assumed to be log-normally distributed (Eq. 3). A constant instantaneous natural mortality of 0.30 is used; this translates to an annual natural mortality of 26% (Zheng et al. 2007).

Equations depicted below are modified from those already published in documents pertaining to CSA models in Southeast Alaska (Woodby 1994; Clark et al. 2003; Zheng et al. 2007).

These are the two processes described in the three-stage CSA model:

$$R_{yr+1} = \mu A_{yr} \quad (1)$$

$$P_{yr+1} = (R_{yr} + P_{yr})e^{Mt_{yr}} - qC_{yr}e^{Ml_{yr}} \quad (2)$$

Where:

R_{yr+1} = relative abundance of recruit crab in year +1

A_{yr} = relative abundance of pre-recruit crab in year yr

μ = proportional constant, a function of the relative catchability of pre-recruit and recruit crab, along with the survival and probability of molting from pre-recruit to recruit crab

P_{yr+1} = relative abundance of post-recruit crab in year +1

C_{yr} = total harvest (in number of crabs) in year yr

t_{yr} = time interval between surveys (in years)

l_{yr} = time lag between the midpoint of the fishery in year yr and the survey in year yr +1

q = catchability coefficient relating relative abundance measured as catch per pot in the survey to absolute abundance of crab in the area

M = instantaneous natural mortality coefficient

The observed catches in the survey are the relative abundances with lognormally distributed measurement error:

$$\tilde{A}_{yr} = A_{yr}e^{\tau_{yr}} \quad (3)$$

$$\tilde{R}_{yr} = R_{yr}e^{u_{yr}}$$

$$\tilde{P}_{yr} = P_{yr}e^{\omega_{yr}}$$

Where:

τ_{yr} , u_{yr} , and ω_{yr} = normal deviates

The values of A_{yr} , R_{yr} , and P_{yr} are estimated by minimizing the squared deviation of the log of the estimated values and observed values. The squared deviations are not weighted to take into account differences in survey methods throughout the years because survey methods have remained

consistent over the time series. Minimizing the sum of the squared deviations was performed using the *optim* function in the most recent version of R.

Model output

The CSA model computes an estimated relative index value for each of the three recruit classes (pre-recruit, recruit, and post-recruit), which is then scaled (using q which is estimated in the model) to a number of male crab for each recruit class. The number of crab in each recruit class is converted to a biomass (lb) using the average weight of all three recruit classes from the survey (using the length-weight relationship established for each area). For each survey area the biomass of both legal (recruits and post-recruits) and mature (all three male recruit classes) is reported. These are summarized annually in the Southeast Alaska Tanner crab stock assessment memorandum prepared by the biometrics group.

REGIONAL ESTIMATION

Tanner crab are managed regionally in Southeast Alaska, therefore the estimate of biomass from all surveyed areas combined is used to produce a regional estimate of Tanner crab by expanding the estimate to the non-surveyed areas based on historic catch data. The period of 1980–2000 is used to establish the proportion of catch in survey (66%) vs. non-surveyed areas (34%). Total estimated biomass is reported annually in the Southeast Alaska Tanner crab stock assessment memorandum, as well as being used to establish season length in the commercial fishery.

STAFF AND RESPONSIBILITIES

- Adam Messmer, Fishery Biologist III (Lead Crab Biologist/Scientific Crew Lead)
- Zane Chapman, Fishery Biologist II (Scientific Crew Lead)
- Tessa Bergmann, Fishery Biologist I (Scientific Crew Lead)
- Joe Stratman, Fishery Biologist III (Scientific Crew Lead)
- Katie Palof, Fishery Scientist I (Biometric Review)
- Caitlin Stern, Biometrician II (Biometric Review)
- Alex Reich, Biometrician II (Biometric Review)

Logistics and Field Studies

Adam Messmer has primary responsibilities associated with logistics and field studies. One of the 3 fishery biologists listed will be the principle investigator of each leg of the survey, the specific person responsible will be listed annually in Appendix D1.

Database Integrity

Zane Chapman has primary responsibilities associated with data entry and database integrity queries. Zane Chapman will be assisted by field crews.

Data Analysis

Alex Reich will have the primary responsibility for catch-survey modeling and matrix analyses.

Stock Assessment/Management Report

An annual regional information report (RIR) will be published, with Alex Reich having primary responsibilities associated with the analysis of survey results and assessment, and Adam Messmer having primary responsibilities associated with the commercial fishery and personal use fishery management recommendations and resulting decisions.

Calendar of Activities

Dates	Activity	Personnel
May/June	Define pot survey locations in ArcGIS	FB II and FB III
September	Regional Operation Planning	FB II and
September	Purchase, prepare, and stage survey gear	FB II and FB III
September/October	Conduct two legs of at-sea surveys	All
November	Compile and edit fall crab pot survey data and submit to biometrics for stock assessment report	Biometrician, FB II, and FB III
November	Stock assessment analysis of catch survey data	Biometrician
December	Finalize stock assessment and management memo	All
December	Management announces the potential season and start date	Management staff

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TABLES AND FIGURES

Table 1.—Southeast Alaska fall crab pot survey location codes.

Survey area	Location code
Icy Strait	2
Holkham Bay	8
Glacier Bay	3
Thomas Bay	5

Table 2.—Southeast Alaska Tanner crab shell age criteria.

Shell condition	Shell age	Description
1, soft	0–2 weeks	The exoskeleton is soft, flaccid, similar in texture to skin, and loses shape out of water. No scratches, abrasions, or epibionts are present.
2, light	2–8 weeks	Carapace and chela are firm, but thin and flexible and can be easily indented with slight thumb pressure. Legs are easily compressed when pinched. Colors are bright. Iridescence is common. Abdominal flap may appear translucent. Spines, chela tips, chela teeth, and dactyls are sharp. No scratches, abrasions, or epibionts are present.
3, new	2–12 months	Carapace and chela are hard and will crack when pressure is applied. Legs are not easily compressed when pinched and will break if bent. Colors are bright and iridescence (especially on the chelas) is often visible. Ventral surfaces can be any variation of white or pink and are not translucent. Spines, chela teeth, and dactyls are sharp. Abdomen and legs have little or no scratches and abrasions. Slight fouling may be present, including; leech egg cases, small barnacles, and encrusting bryozoans. Adult females rarely have grasping marks on the meri.
4, old	13–24 months	Skip molts. Colors are dull, but there may be some visible iridescence on the chelas. Ventral surfaces typically appear yellow to brown. Spines, chela tips, chela teeth, and dactyls show some wear and appear dull. Abdomen and legs have few to numerous scratches and abrasions, which are slightly darker than the shell. The meat content is full. Some fouling may be present, including but not limited to; leech egg cases, barnacles, bryozoans, and tubeworm casings. Females mated a second time will can show grasping marks on the meri.
5, very old	>24 months	Color is dull and dark on dorsal surface. Ventral surface typically appears yellow to brown with darker areas. Spines, chela tips, chela teeth, and dactyls are heavily worn. Legs are commonly damaged or missing. Abdomen and legs have numerous scratches and abrasions, which are typically darker than the shell. Moderate to heavy fouling is common, including but not limited to; leech egg cases, large barnacles, bryozoans, hydroids, anemones, and tubeworm casings. Adult females will have abdomens that appear very worn and scuffed. Females that have been mated more than two times can have multiple grasping marks on the merus.

Note: Table adapted from Donaldson and Byersdorfer (2005).

Table 3.—Southeast Alaska crab pot survey bycatch species code list.

Species code	Species	Species code	Species
110	Pacific (gray) cod	850	Weathervane scallop
127	Yellowfin sole	892	Red sea urchin
129	Starry flounder	894	California sea cucumber
130	Lingcod	910	Dungeness crab
145	Yelloweye rockfish	921	Red king crab
147	Quillback rockfish	922	Blue king crab
200	Halibut	923	Golden king crab
270	Walleye pollock	931	Tanner crab
710	Sablefish (blackcod)	964	Coonstripe shrimp
870	Octopus	965	Spot shrimp
363	Neptunea species	381	Pycnopodia

Table 4.–Southeast Alaska crab survey codes for pots to describe debris, substrate, pot condition, type, dimensions, escape device, and bait.

Code	Debris	Substrate	Pot condition	Pot type	Pot dimensions	Escape device	Bait
0	a	Unknown	a	a	a	a	a
1	Large brown kelp	Mud	Normal	Pyramid	4' diameter	None/closed rings	No bait
2	Mussels	Mud/gravel	Not baited	Cone	5–5'11" diameter	king (4, 6 ¼ inch rings)	Jar & hanging
3	Shells	Mud/clay	Lost	Square	6–6'11" diameter	king (9 inch stretch mesh)	Jar only
4	Woody debris	Mud/shell	Door open	Dungeness	7–7'11" diameter	Tanner (4, 4 ¾ inch rings)	hanging only
5	Hair kelp	Mud/soft	Broken webbing	a	7x7	Tanner (7 inch stretch mesh)	a
6	Barnacles	Mud/hard	Upside down	a	8x8	Dungeness (2, 4 ⅜ inch rings)	a
7	Sponges	Clay	Collapsed tunnel	a	9x9	a	a
8	a	Sand	Not on bottom	a	a	a	a
9	a	Gravel	Pot open/broken	a	a	a	a
10	a	Boulder	Lost pot contents	a	a	a	a
11	a	Cobble	a	a	a	a	a
12	a	Rock	a	a	a	a	a
13	a	Hard	a	a	a	a	a
14	a	Soft	a	a	a	a	a
15	a	Shell	a	a	a	a	a
16	a	Coral	a	a	a	a	a
17	a	Mixed	a	a	a	a	a
18	a	Silt	a	a	a	a	a
19	a	Barnacle	a	a	a	a	a
20	a	Mussels	a	a	a	a	a

^a code not used

Table 5.–Leg loss codes used for the Tanner crab survey.

Code	Criteria
4	Carapace damage
5	Combination of conditions

Table 6.–Southeast Alaska crab survey parasite condition codes.

Code	Parasite
1	None
2	Briarosaccus, single scar
3	Briarosaccus, double scar
4	Briarosaccus, single externa
5	Briarosaccus, double externa
6	Bitter crab, <i>Hematodinium</i>
7	Microsporidian
8	Nemertean worms

Table 7.–Southeast Alaska crab survey female reproductive condition codes.

Code	Clutch condition	Egg development
1	Normal	Eyed eggs
2	<20% dead eggs in the clutch	Uneyed eggs
3	>20% dead eggs in the clutch	No eggs
4	Barren with silky setae	NA
5	Barren with matted setae and empty egg cases	NA

Note: codes come from Donaldson and Byersdorfer 2005. NA indicates not applicable.

Table 8.–Southeast Alaska crab survey sample goals by carapace width range category for male Tanner crab chela height measurements.

Carapace width	Sample goal
<106	25
106–114	25
115–122	25
123–131	25
132–152	25
>152	25

Table 9.–Southeast Alaska Tanner crab survey length-weight conversion formula coefficients.

Survey Area	Intercept	Slope
Glacier Bay	-9.48	3.30
Icy Strait	-9.48	3.29
Thomas Bay	-9.67	3.32
Holkham Bay	-9.73	3.34

Note: formula is $\text{weight (lb)} = \exp[\text{Intercept} + \text{slope} \cdot \ln(\text{carapace length})] \cdot (2.2/1000)$.

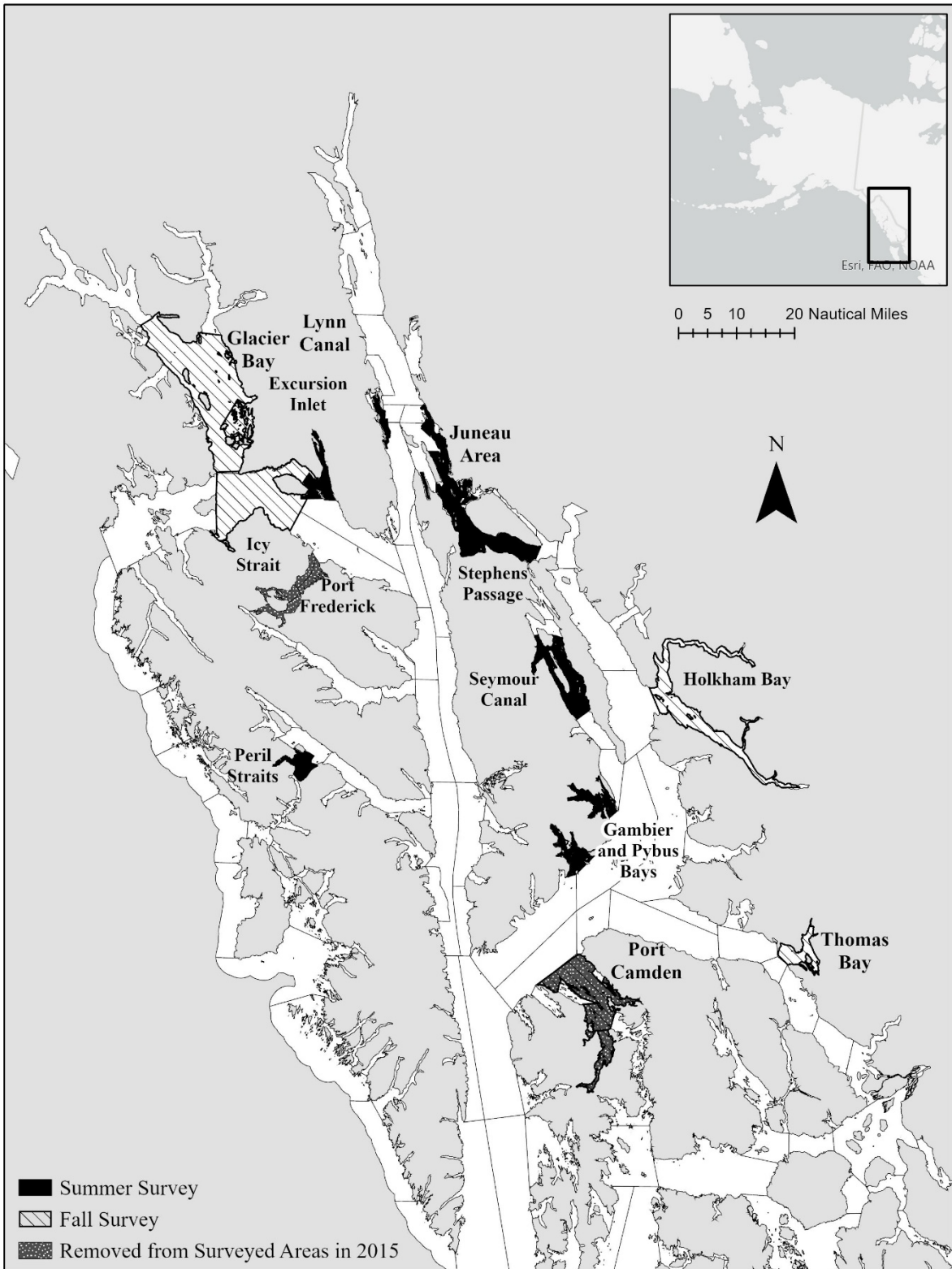


Figure 1.—Southeast Alaska summer and fall crab survey areas.



Figure 2.—Crab carapace measurements, left: measuring carapace length, all king crab and right: measuring carapace width applicable to both Tanner (pictured) and Dungeness crab.

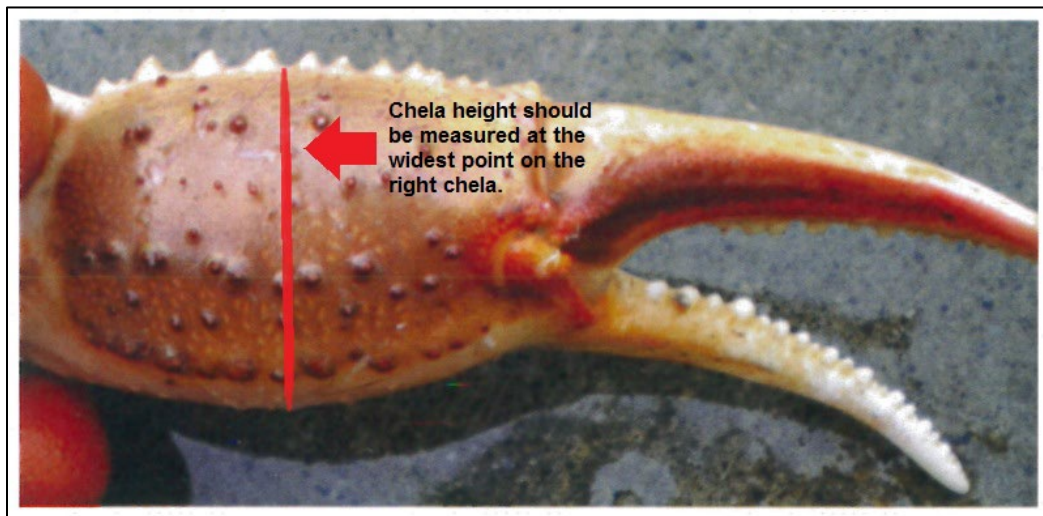


Figure 3.—Chela height measurement location for male Tanner crab, right claw.

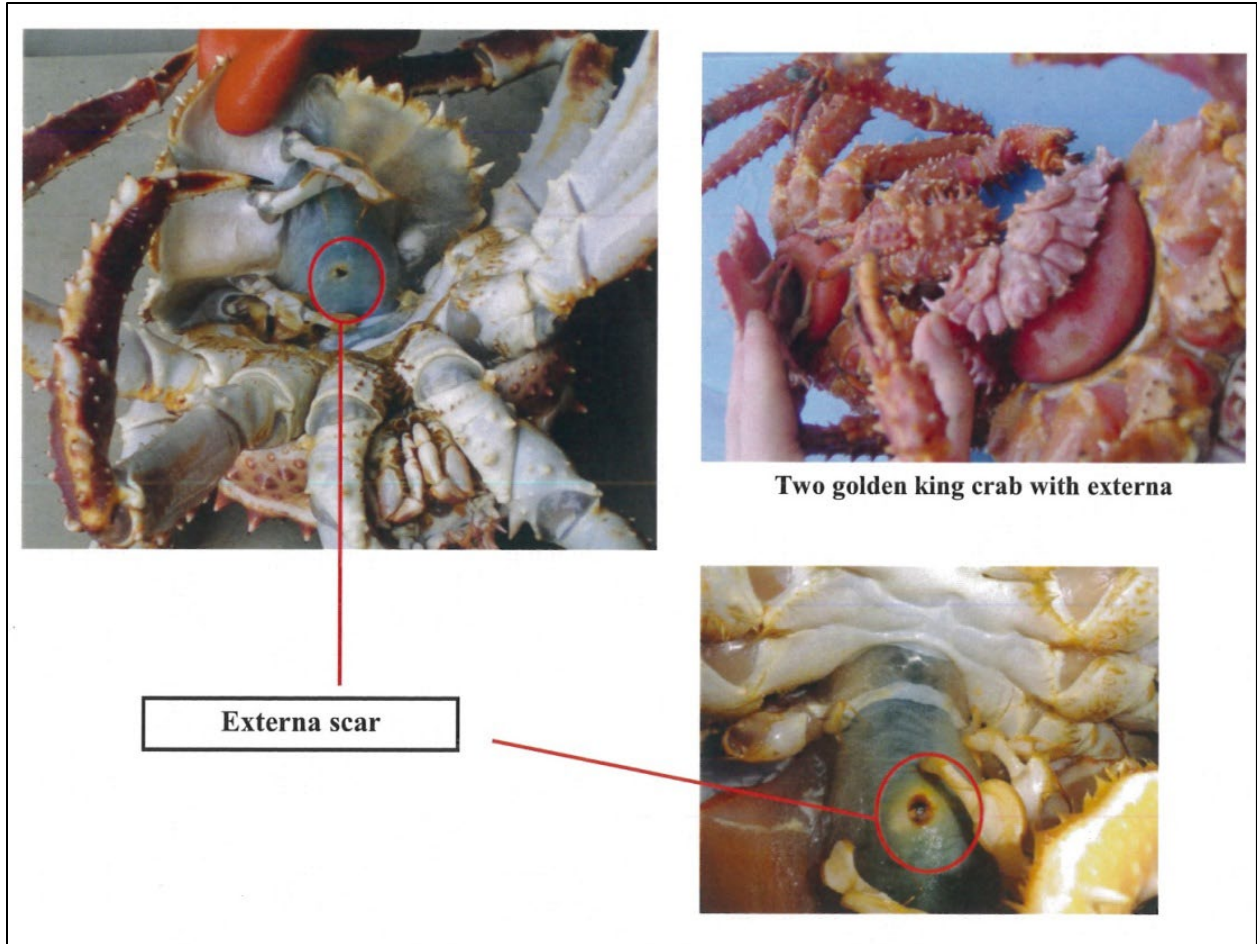


Figure 4.—*Briarosaccus externa* and externa scars on red and golden king crab.

**APPENDIX A: HOBO WATER TEMPERATURE DATA
LOGGER INSTRUCTIONS**

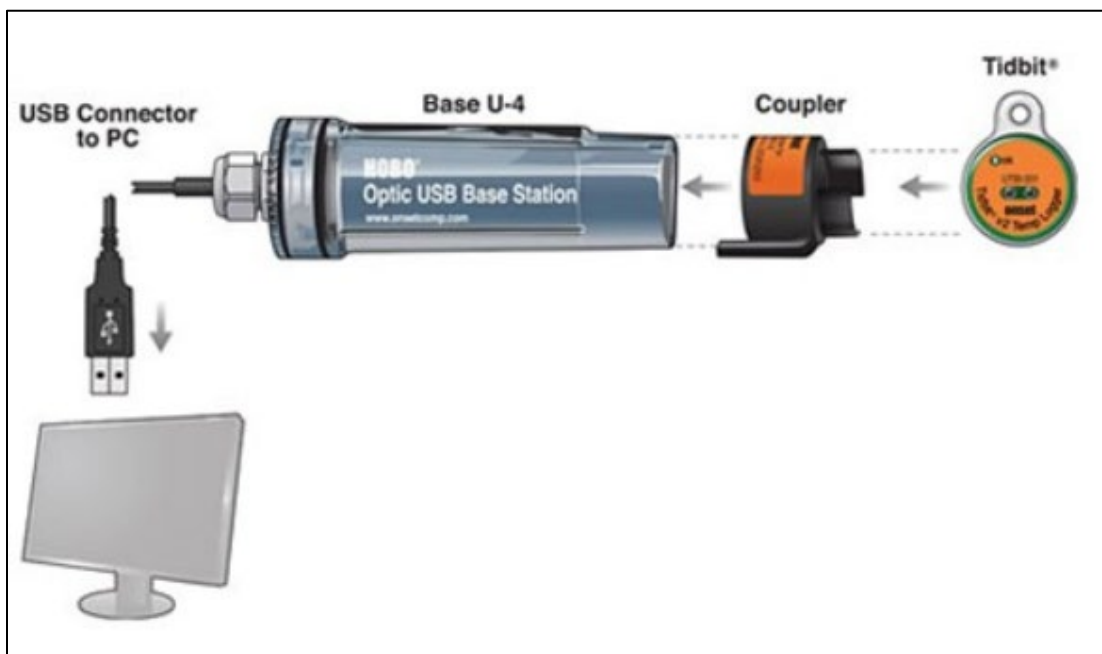
Appendix A1.–HOBO Water Temperature Data Logger Instructions.

- 1) One logger for each pot (~20–28) will be deployed on the first day of setting per trip (Appendix A1).
- 2) Activate logger using optical USB base station attached to computer (Appendix A2).
 - a. Name will be a unique number that matches the buoy number of the pot in which logger will be attached.
 - b. Time interval: 1-hour.
 - c. Check that red ‘OK’ light is flashing before activating the next tidbit.
- 3) One temperature logger will be placed on each deployed pot with a cable tie near the tunnel of the pot, and with the buoy number facing out.
- 4) Write in comments column of skipper form, ‘Tidbit # X’ (where X is the number of the tidbit). This should be done by the crewmember in the wheelhouse documenting coordinates and associated data during the setting of pots each day.
- 5) Temperature loggers will be downloaded at the end of each leg, saved in Excel, and transferred to a file on the desktop of the R/V *Medeia* computer.
- 6) Files will be saved on a memory stick (or other media) aboard vessel; leave backup copy aboard R/V *Medeia* computer.
- 7) Files will be saved to: CF...Shellfish\Temperature\current year.
- 8) Detailed Data Download Instructions:
 - a. Files will be saved using the .dtf format and subsequently exported to a .txt format.
 - b. Export file:
 - i. Plug tidbit into the docking device
 - ii. Device → Readout → Stop.
 - iii. Create a custom folder for the survey
 - iv. File → Export Table Data → Export.
 - v. Date format: Month/Day/Year
 - vi. Date/Time Separator: Tab
 - vii. Time Format: Hr:Min:Sec
 - viii. Data Separator: Tab
 - ix. Highlight “Temperature (*C)” only.
 - c. Save file as the tidbit number to the custom survey folder created in b:
 - i. For example, Tidbit #8 should be saved as 8.txt
 - d. Open .txt file in Excel:
 - i. File → Open (Do not double click the text file to open).
 - ii. Select “Finish” on the import menu.
 - e. To be done post survey:
 - i. Within the Zander application click on “import Temperature Data”
 - ii. Click "Edit Temperature Data”
 - iii. Set the Discard Temperatures within X minutes to 30 minutes
 - iv. Import all the excel files from the entire leg by choosing all the excel files, the app will produce an average temperature for each pot at each location
 - v. Look through the results and check the temperature variance for each pot location, if greater than 2 check the raw data for any outliers
 - vi. If outlier occurs, check the raw data for the correct pot data or adjust the cutoff to remove the outlier

Appendix A2.–HOBO water temperature data logger device that will be attached to each deployed crab pot.



Appendix A3.–HOBO optic USB base station attached to computer; used to activate loggers.



APPENDIX B: SURVEY DATA FORMS

Appendix B2.-Crab Survey Specimen and Incidental Species Form.

CRAB SURVEY SPECIMEN		Date _____	Page _____ of _____
Year _____	Project _____	Trip # _____	Recorder _____
Location _____	Pot # (Order) _____	Buoy# _____	

Pot Condition	Substrate	Debris

Incidental Species			
#			
Species			

Specimen #	Subsample Rate <small>910 Dung. 921 RKC 922 BKC 923 GKC 931 Bairdi</small>	Species Code	Sex	Size (mm)	Weight (gms)	Legal Size	Shell Condition	Abnormal Carapace = 4	Female Egg Data			Parasite	Blackmat 1 = Present	Tag #	Comments
									% Clutch Fullness	Development	Condition				
1															
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Appendix B3.–Tanner Crab Chela Height Size Category Tally Sheet.

Male Tanner crab chela heights: This tally sheet can be printed used to track the number of male Tanner crab of each size category to be sampled in the field. Throughout the day, collect chela height for carapace length categories listed below:

Carapace size	<106	106-114	115-122	123-131	132-152	>152
Sample number	25	25	25	25	25	25

Carapace size	<106	106-114	115-122	123-131	132-152	>152
Sample number	25	25	25	25	25	25

VOLUNTEER AGREEMENT – Alaska Department of Fish & Game

This agreement is entered into between the State of Alaska Department of Fish and Game (State) whose address is _____ and _____

Volunteer Name _____ Address _____ Phone _____

WHEREAS, the volunteer desires to participate as an unpaid worker alongside, but not displacing, state employees, as follows:

Division: _____ Region: _____
Location: _____ Dates: _____ to _____

Description of Project and Duties:

Questions marked with *** are considered high risk and must be approved by the Division Director or Designee if 'Yes' is checked.

*** *Is the Volunteer a minor under the age of 18?* Yes No

If 'Yes' is checked above, please state the age of the minor volunteer _____

Parent(s) of the minor volunteer have read/will comply with the department's SOP No. III-524 Yes No

*** *Will activities require use or carrying of firearms and/or ammunition?* Yes No

If 'Yes' is checked above, the volunteer **MUST** complete the [State of Alaska Volunteer Qualification Inquiry - Firearm Possession](#) form and attach it to this form. In accordance with the Federal Omnibus Consolidated Appropriations Act of 1997 (PL 104-208), anyone convicted of a misdemeanor crime of domestic violence may not perform duties that require the use of or access to firearms and/or ammunition. Further, if 'Yes' is checked above, the volunteer **MUST** provide proof of training in firearm safety in the form of a certificate or other documentation reflecting completion of a formal class.

Will activities require travel in or operation of a state vehicle? Yes No

If 'Yes', indicate below:

Travel in: highway vehicle off-road vehicle small boat large boat aircraft*

*** *Operate:* highway vehicle* off-road vehicle* small boat*

Describe below the justification for and the limited circumstances under which the volunteer is authorized to operate a state vehicle or travel in a state aircraft:

*As a general rule, volunteers are *not* authorized to drive state vehicles, operate small boats, or travel in state aircraft. Under certain circumstances and with pre-approval, limited operation of state equipment or travel in state aircraft when necessary to further the volunteer's project/assignment may be allowable. Such use should be kept to a minimum and is allowable only if specified on this agreement form, approved by the regional supervisor (or equivalent), and only if the volunteer is properly licensed and trained to operate such vehicle/equipment. For additional details, see the following ADF&G Standard Operating Procedures: III-524, Volunteer Workers; III-004 Aircraft-Authorized Passengers; II-091 State-Owned Vehicles, Vessels, and Equipment.

WHEREAS, the State desires to allow the volunteer to participate in said program.

NOW, THEREFORE, the parties agree as follows:

The Volunteer agrees to participate without compensation for his/her activities in the Program under the direct supervision of state employee _____ (ADF&G Supervisor).

- For the duration of the Volunteer's participation in the program, the State agrees to provide to the volunteer medical coverage and disability compensation, in amounts comparable to that afforded employees under the Alaska Workers' Compensation Act (AWCA), if the volunteer suffers injury, illness or death that arises out of, and occurs while acting within the course and scope of performance of his/her volunteer duties. It is agreed that weekly compensation for disability or death will be based on the minimum rate of compensation under AS 23.30.175. It is agreed that compensation or medical coverage will not be provided when the volunteer may be eligible for coverage by any other health or disability policy, insurance, payment or benefit, (inc. Medicaid, Medicare, Social Security, or pension) or workers' compensation coverage by another employer. Disputes regarding payment of compensation and medical benefits under this agreement are agreed to be decided by the Alaska Workers' Compensation Board without stipulating to the Board's jurisdiction. The State is not subject to AWCA penalty, interest, Second Injury Fund (SIF), or other payment in regard to the volunteer.
- The State agrees to defend, indemnify, and hold harmless the Volunteer in the same manner and to the same extent the State protects its employees from any claim, demand, suit for property damages or personal injury including death allegedly caused by the Volunteer's activities if the Volunteer: a) at the time of the occurrence was acting in good faith within the course and scope of his/her volunteer duties in accordance with the directions of the supervisor; b) the volunteer provides immediate notice to the State of any claim; and c) the volunteer cooperates in the defense and does not stipulate to any judgment or settlement without the State's approval.
- The volunteer understands the State does not insure loss or physical damage to its employee's personal vehicle, equipment, or other personal property used while performing state work; nor will the State provide property insurance coverage for loss or physical damage to any volunteer's personal vehicle, equipment, or other personal property used while performing his/her volunteer duties.
- In consideration of the benefits received from participation in the program and the protection offered by this agreement, the volunteer: 1) accepts the remedy provided by the State, and dispute resolution by the Alaska Workers' Compensation Board, as his/her sole legal remedy from the State if the volunteer suffers injury, illness or death arising out of, and occurring while acting within the course and scope of, his/her volunteer duties; 2) transfers his/her right to recover from others who may be responsible for the injury, illness, or death to the State and/or its assigns upon payment of compensation or medical expenses by the State; and 3) agrees to cooperate and to do everything necessary to enable the State and/or its assigns to enforce the right to recover from others.

The Agreement is effective on the day when signed by the person designated below as the Regional Supervisor and filed with the Division of Risk Management. The Alaska Department of Fish and Game agrees to provide transportation to/from _____ and _____. The following provisions (lodging, food, camp and sampling supplies, etc.) will be supplied:

The volunteer acknowledges he/she has read this agreement, understands it, and agrees to be bound by its terms.

Person to be notified in event of serious illness or accident:

Name	Address	Phone	Relationship
_____	_____	_____	_____

SIGNATURES:

Volunteer: _____ <small>(or parent of minor volunteer)</small>	Date _____
ADF&G Supervisor: _____	Date _____
Regional Supervisor: _____	Date _____

Questions marked with *** on page 1 are considered high risk and must be approved by the Division Director or Designee if 'Yes' is checked.

Division Director or Designee: _____ **Date** _____
(Designee must be equivalent to Assistant Director or Division Operations Manager)

When complete, send the form to divisional headquarters office for distribution as described below.

Original or email: State of Alaska (SOA) Division of Risk Management by e-mail; Copies: ADF&G divisional headquarters, Volunteer, DAS Director when Division Director approval is needed.

R/V MEDEIA COMPUTER

- Open “Site 200X.txt file.
- Open “Medeia template” file.
- Cut and paste lat/long into appropriate columns from text file to template file.
 - The lat/long column order is reversed in the template file. Make sure “latitude” is before “longitude” in the template file or Maptech will not recognize it.
- Cut and paste “strata” into “Notes/Strata” column.
- Enter name. This entry must start with 48sgw for Maptech to recognize it.
- Individually name each pot location an (e.g., 48sgwHolkham 1, 48sgwHolkham 2, 48sgwHolkham 3,...).
- Save as “marks32.txt” (This is the only file name Maptech recognizes).

MAPTECH

- Open Maptech (on Medeia wheelhouse computer).
- File> Import from File and browse for the folder where the “marks32” file is located.
- Select all marks for the site and import. It will give the number of marks imported successfully.
- Check the chart to make sure pot locations have in fact shown up in the appropriate spot.
- Repeat procedure for each site text file.
- Overwrite the “marks32” file each time.
- A detailed explanation of the Maptech import/export format in R:>..... /Tanner pot location maps /Transfer to Medeia> Maptech export format explanation.

MAXSEA

- The skipper of the R/V *Medeia* will import pot locations from Maptech to Maxsea once they have created routes between pots.

**APPENDIX C: INSTRUCTIONS FOR TRANSFERRING POT
COORDINATE DATA TO R/V *MEDEIA* NAVIGATIONAL
COMPUTERS**

R/V MEDEIA COMPUTER

- Open “Site 200X.txt file.
- Open “Medeia template” file.
- Cut and paste lat/long into appropriate columns from text file to template file.
 - **The lat/long column order is reversed in the template file. Make sure “latitude” is before “longitude” in the template file or Maptech will not recognize it.**
- Cut and paste “strata” into “Notes/Strata” column.
- Enter name. This entry must start with 48sgw for Maptech to recognize it.
- Individually name each pot location an (e.g., 48sgwHolkham 1, 48sgwHolkham 2, 48sgwHolkham 3,...).
- Save as “marks32.txt” (This is the only file name Maptech recognizes).

MAPTECH

- Open Maptech (on Medeia wheelhouse computer).
- File> Import from File and browse for the folder where the “marks32” file is located.
- Select all marks for the site and import. It will give the number of marks imported successfully.
- Check the chart to make sure pot locations have in fact shown up in the appropriate spot.
- Repeat procedure for each site text file.
- Overwrite the “marks32” file each time.
- A detailed explanation of the Maptech import/export format in R:/>..... /Tanner pot location maps /Transfer to Medeia> Maptech export format explanation.

MAXSEA

- Open Maxsea
- File> Import from File and browse for the folder where the “marks32” file is located
- Select import files
- Once locations are imported click the tab on the top of the screen to view marks.

APPENDIX D: 2024 SURVEY INFORMATION

Appendix D1.–2024 Fall crab survey schedule.

The fall crab survey is composed of two legs conducted on the R/V *Medeia*. If any staffing changes occur mid-trip, due to illness or otherwise, the project leaders (Adam Messmer, Tessa Bergmann, and Zane Chapman) must be notified immediately.

R/V *Medeia* Vessel Crew

Position	Title	Crew
Captain	Boat Officer IV	Cedar Stark
First Mate	Boat Officer III	Jacob Eberhardt
Engineer	Boat Officer II	Rick Gotwald
Cook/Mate	Boat Officer I	Katy Hamilton

Leg 1: Holkham and Thomas Bay (8 days)

Dates: October 7–14, 2024

Vessel: R/V *Medeia*

Biologists: Adam Messmer (lead), Zane Chapman, Tessa Bergmann, and Alex Reich

Date	Day	Location	Morning task	Afternoon task	# of Pots
10/7	Monday	Holkham Bay	Travel to Holkham Bay	Set pots Holkham Bay	26
10/8	Tuesday	Holkham Bay	Pull pots	Set Pots Holkham Bay	26
10/9	Wednesday	Holkham Bay	Pull pots	Set Pots Holkham Bay	26
10/10	Thursday	Holkham Bay	Pull pots	Run to Thomas Bay	
10/11	Friday	Thomas Bay	Travel to Thomas Bay	Set Pots Thomas Bay	26
10/12	Saturday	Thomas Bay	Pull pots	Set Pots Thomas Bay	26
10/13	Sunday	Thomas Bay	Pull pots	Travel to Juneau.	
10/14	Monday	Thomas Bay	Travel to Juneau	Travel to Juneau	

Leg 2: Glacier Bay and Icy Strait (7 days)

Dates: October 21–27, 2024

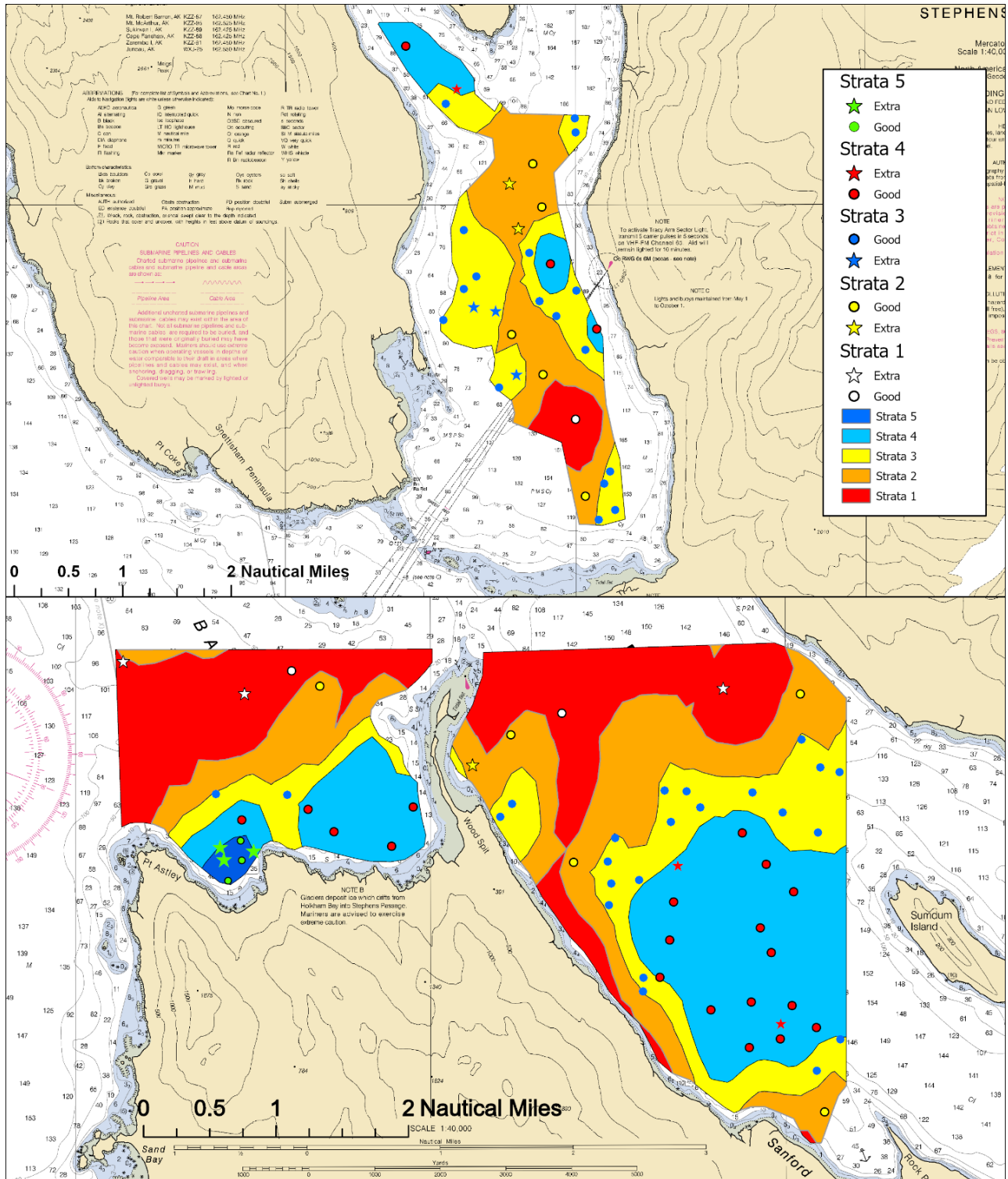
Vessel: R/V *Medeia*

Biologists: Zane Chapman (lead), Joe Stratman, and Daison Weedop

Date	Day	Location	Morning Task	Afternoon Task	# of Pots
10/21	Monday		Travel to Glacier Bay		
10/22	Tuesday	Glacier Bay	Travel to Glacier Bay	Set pots in Glacier Bay	26
10/23	Wednesday	Glacier Bay	Pull pots	Set pots in Glacier Bay	26
10/24	Thursday	Glacier Bay	Pull pots	Set pots in Icy Strait	26
10/25	Friday	Icy Strait	Pull pots	Set pots in Icy Strait	26
10/26	Saturday	Icy Strait	Pull pots	Travel to Juneau	
10/27	Sunday		Travel to Juneau		

**APPENDIX E: 2024 HOLKHAM BAY SURVEY AREA POT
LOCATIONS**

Appendix E1.-2024 Holkham Bay survey area fall crab pot locations.



Appendix E2.–2024 fall pot location coordinates for Holkham Bay survey area with strata and status.

Strata	Latitude	Longitude	Status
1	57.74025	-133.655	Extra
1	57.73680	-133.514	Extra
1	57.73621	-133.627	Extra
1	57.73905	-133.616	Good
1	57.80055	-133.583	Good
1	57.73373	-133.552	Good
2	57.82977	-133.600	Extra
2	57.83667	-133.602	Extra
2	57.72723	-133.573	Extra
2	57.73715	-133.609	Good
2	57.73603	-133.496	Good
2	57.71497	-133.550	Good
2	57.80739	-133.593	Good
2	57.83306	-133.593	Good
2	57.78875	-133.581	Good
3	57.73099	-133.564	Good
2	57.83967	-133.595	Good
2	57.68359	-133.491	Good
2	57.81350	-133.602	Good
3	57.80739	-133.600	Extra
3	57.81714	-133.606	Extra
3	57.81776	-133.612	Extra
3	57.84664	-133.583	Good
3	57.72348	-133.617	Good
3	57.69874	-133.533	Good
3	57.68879	-133.493	Good
3	57.70051	-133.533	Good
3	57.78511	-133.577	Good
3	57.71803	-133.540	Good
3	57.79064	-133.575	Good
3	57.73033	-133.496	Good
3	57.71506	-133.542	Good
3	57.72362	-133.634	Good
3	57.71231	-133.541	Good
3	57.72070	-133.567	Good
3	57.84887	-133.621	Good
3	57.72120	-133.501	Good
3	57.72398	-133.528	Good

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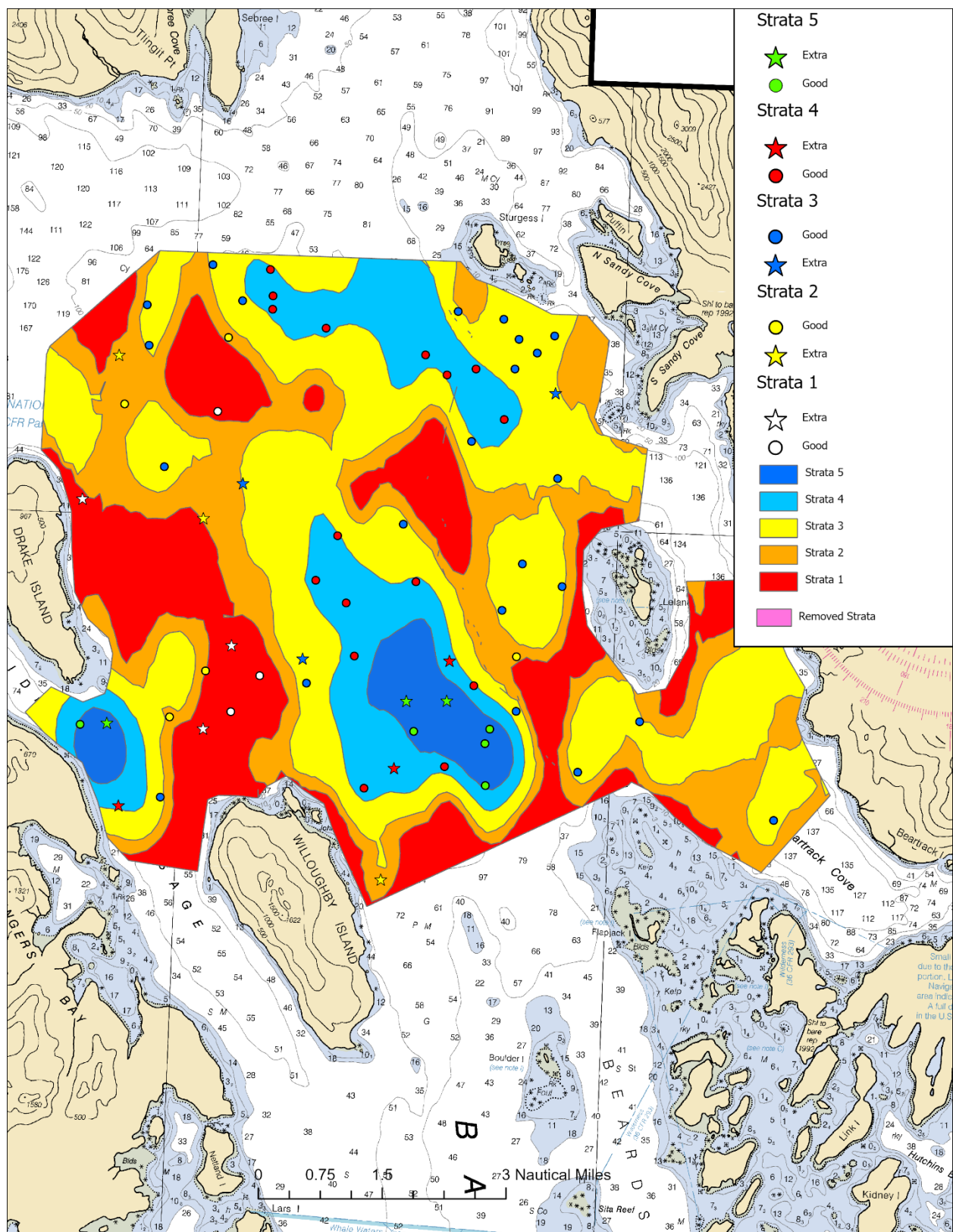
Strata	Latitude	Longitude	Status
3	57.82048	-133.615	Good
3	57.78661	-133.572	Good
3	57.70963	-133.541	Good
3	57.81116	-133.580	Good
3	57.81633	-133.589	Good
3	57.82022	-133.583	Good
3	57.72390	-133.523	Good
3	57.82955	-133.615	Good
3	57.82602	-133.597	Good
3	57.84449	-133.583	Good
3	57.79252	-133.573	Good
3	57.81864	-133.594	Good
3	57.72626	-133.487	Good
3	57.80541	-133.605	Good
3	57.72369	-133.508	Good
3	57.71867	-133.492	Good
3	57.71274	-133.534	Good
3	57.82244	-133.612	Good
3	57.72006	-133.527	Good
3	57.69268	-133.487	Good
3	57.81575	-133.621	Good
3	57.72683	-133.492	Good
3	57.72234	-133.564	Good
3	57.72184	-133.520	Good
4	57.69468	-133.501	Extra
4	57.85117	-133.617	Extra
4	57.71455	-133.525	Extra
4	57.71887	-133.606	Good
4	57.69276	-133.501	Good
4	57.69168	-133.509	Good
4	57.71706	-133.592	Good
4	57.82432	-133.590	Good
4	57.71471	-133.504	Good
4	57.70523	-133.527	Good
4	57.71865	-133.510	Good
4	57.70671	-133.506	Good
4	57.69644	-133.518	Good
4	57.70359	-133.503	Good
4	57.72034	-133.628	Good
4	57.69417	-133.493	Good

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Strata	Latitude	Longitude	Status
4	57.70055	-133.530	Good
4	57.72197	-133.587	Good
4	57.85773	-133.632	Good
4	57.71121	-133.498	Good
4	57.71000	-133.526	Good
5	57.69695	-133.498	Good
5	57.72166	-133.612	Good
5	57.69743	-133.508	Good
5	57.81433	-133.577	Good
5	57.71538	-133.632	Extra
5	57.71646	-133.625	Extra
5	57.71693	-133.633	Extra
5	57.71528	-133.628	Good
5	57.71275	-133.631	Good
5	57.71772	-133.628	Good

**APPENDIX F: 2024 THOMAS BAY SURVEY AREA POT
LOCATIONS**

Appendix F1.–2024 Thomas Bay survey area fall crab pot locations.



Appendix F2.–2024 fall pot location coordinates for Thomas Bay survey area with strata and status.

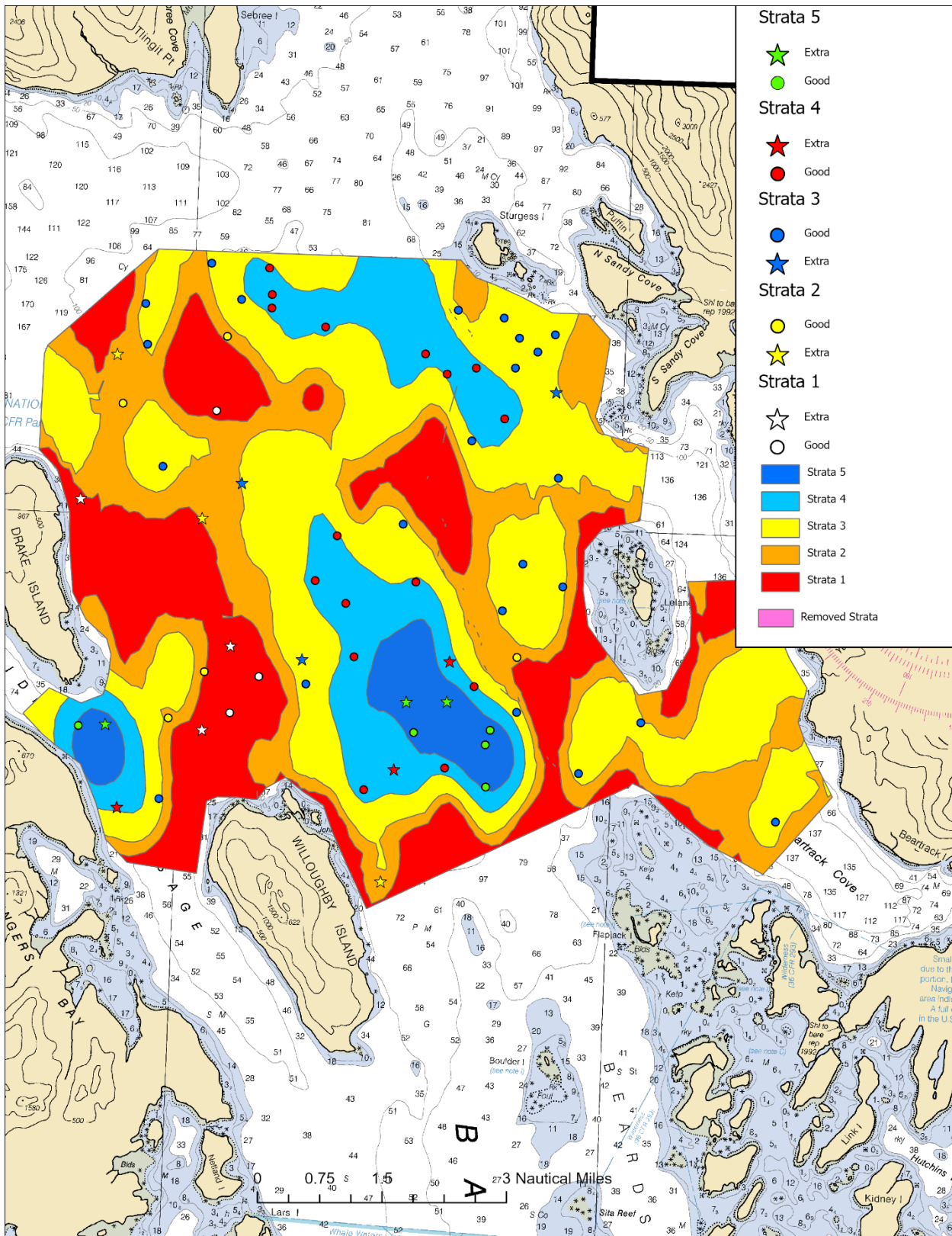
Strata	Latitude	Longitude	Status
1	57.0237	-132.955	Extra
1	57.0218	-132.977	Extra
1	57.0070	-132.957	Extra
1	57.0014	-132.952	Good
1	57.0076	-132.966	Good
1	57.0053	-132.960	Good
2	56.9993	-132.927	Extra
2	57.0042	-132.948	Extra
2	57.0214	-132.958	Extra
2	57.0333	-132.938	Good
2	57.0083	-132.951	Good
2	57.0194	-132.908	Good
2	57.0119	-132.969	Good
2	57.0091	-132.938	Good
2	57.0129	-132.932	Good
2	57.0252	-132.981	Good
2	57.0102	-132.934	Good
2	57.0261	-132.936	Good
2	57.0114	-132.948	Good
2	57.0225	-132.966	Good
2	57.0093	-132.972	Good
3	57.0230	-132.886	Extra
3	57.0311	-132.966	Extra
3	57.0085	-132.901	Extra
3	57.0365	-132.937	Good
3	57.0187	-132.950	Good
3	57.0431	-132.952	Good
3	57.0152	-132.967	Good
3	57.0067	-132.869	Good
3	57.0409	-132.959	Good
3	57.0314	-132.948	Good
3	56.9993	-132.895	Good
3	57.0118	-132.956	Good
3	57.0275	-132.966	Good
3	57.0465	-132.964	Good
3	57.0103	-132.898	Good
3	57.0316	-132.952	Good
3	57.0166	-132.958	Good
3	57.0129	-132.902	Good

-continued-

Strata	Latitude	Longitude	Status
4	57.00233	-132.931	Extra
4	57.01859	-132.902	Extra
4	57.01046	-132.865	Extra
4	57.00113	-132.888	Good
4	57.01483	-132.904	Good
4	57.00393	-132.882	Good
4	56.99846	-132.910	Good
4	57.00717	-132.883	Good
4	57.02353	-132.898	Good
4	57.00587	-132.881	Good
4	57.01479	-132.862	Good
4	57.00186	-132.907	Good
4	57.00143	-132.912	Good
4	57.01857	-132.870	Good
4	57.02182	-132.874	Good
4	57.01288	-132.866	Good
4	57.00143	-132.894	Good
4	57.01058	-132.888	Good
4	57.01430	-132.889	Good
4	57.02116	-132.879	Good
5	57.01870	-132.897	Extra
5	57.01630	-132.895	Extra
5	57.00220	-132.903	Extra
5	57.00590	-132.890	Good
5	57.00370	-132.899	Good
5	57.00340	-132.891	Good
5	57.01390	-132.895	Good
5	57.00540	-132.895	Good

**APPENDIX G: 2024 GLACIER BAY SURVEY AREA POT
LOCATIONS**

Appendix G1.—2024 Glacier Bay survey area fall crab pot locations.



Appendix G2.–2024 Fall pot location coordinates for Glacier Bay survey area with strata and status.

Strata	Latitude	Longitude	Status
1	58.64111	-136.148	Extra
1	58.66951	-136.207	Extra
1	58.62413	-136.158	Extra
1	58.63519	-136.136	Good
1	58.62774	-136.147	Good
1	58.68810	-136.156	Good
2	58.69869	-136.195	Extra
2	58.59504	-136.087	Extra
2	58.66646	-136.160	Extra
2	58.70301	-136.153	Good
2	58.62622	-136.171	Good
2	58.68887	-136.192	Good
2	58.63578	-136.157	Good
2	58.64087	-136.038	Good
3	58.67379	-136.146	Extra
3	58.63894	-136.120	Extra
3	58.69416	-136.026	Extra
3	58.67655	-136.176	Good
3	58.65957	-136.036	Good
3	58.67702	-136.024	Good
3	58.63408	-136.118	Good
3	58.69875	-136.042	Good
3	58.68390	-136.058	Good
3	58.70089	-136.184	Good
3	58.62990	-136.037	Good
3	58.70898	-136.185	Good
3	58.70871	-136.047	Good
3	58.61805	-136.012	Good
3	58.62866	-135.989	Good
3	58.61001	-136.173	Good
3	58.65530	-136.021	Good
3	58.70479	-136.041	Good
3	58.60966	-135.936	Good
3	58.66674	-136.083	Good
3	58.70570	-136.027	Good
3	58.71754	-136.160	Good
3	58.70213	-136.034	Good
3	58.71053	-136.148	Good

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Strata	Latitude	Longitude	Status
3	58.70991	-136.065	Good
3	58.65009	-136.044	Good
3	58.61757	-136.083	Extra
4	58.63956	-136.063	Extra
4	58.60804	-136.189	Extra
4	58.69711	-136.068	Good
4	58.65483	-136.116	Good
4	58.71174	-136.137	Good
4	58.61824	-136.064	Good
4	58.70093	-136.077	Good
4	58.68851	-136.045	Good
4	58.63471	-136.054	Good
4	58.69851	-136.057	Good
4	58.70903	-136.137	Good
4	58.61333	-136.095	Good
4	58.70564	-136.116	Good
4	58.71702	-136.138	Good
4	58.65520	-136.077	Good
4	58.63981	-136.100	Good
4	58.65045	-136.104	Good
5	58.66397	-136.108	Good
5	58.63151	-136.064	Extra
5	58.62457	-136.195	Extra
5	58.63118	-136.079	Extra
5	58.62513	-136.076	Good
5	58.61470	-136.048	Good
5	58.62610	-136.047	Good
5	58.62315	-136.049	Good
5	58.62407	-136.205	Good

**APPENDIX H: 2024 ICY STRAIT SURVEY AREA POT
LOCATIONS**

Appendix H2.–2024 fall pot location coordinates for Icy Strait survey area with strata and status.

Strata	Latitude	Longitude	Status
1	58.36341	-135.742	Extra
1	58.35335	-135.771	Extra
1	58.34448	-135.712	Extra
1	58.34941	-135.779	Good
1	58.30748	-135.680	Good
1	58.35036	-135.733	Good
2	58.31733	-135.702	Extra
2	58.36119	-135.754	Extra
2	58.31390	-135.696	Extra
2	58.35218	-135.759	Good
2	58.35898	-135.754	Good
2	58.35694	-135.751	Good
2	58.30633	-135.692	Good
2	58.36428	-135.748	Good
2	58.36222	-135.746	Good
2	58.31733	-135.702	Extra
2	58.36119	-135.754	Extra
3	58.36016	-135.748	Extra
3	58.33404	-135.785	Extra
3	58.34841	-135.741	Extra
3	58.33459	-135.800	Good
3	58.33644	-135.720	Good
3	58.34223	-135.747	Good
3	58.30192	-135.703	Good
3	58.33902	-135.778	Good
4	58.33278	-135.769	Extra
4	58.31815	-135.714	Extra
4	58.33659	-135.739	Extra
4	58.33105	-135.788	Good
4	58.33297	-135.742	Good
4	58.31463	-135.753	Good
4	58.32890	-135.806	Good
4	58.33412	-135.731	Good
4	58.30898	-135.722	Good
4	58.30896	-135.741	Good
4	58.31132	-135.749	Good
4	58.31315	-135.722	Good
4	58.33582	-135.742	Good
4	58.33038	-135.801	Good

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Appendix H2.–Page 2 of 2.

Strata	Latitude	Longitude	Status
4	58.33586	-135.754	Good
4	58.30918	-135.713	Good
4	58.30552	-135.731	Good
4	58.33251	-135.751	Good
4	58.32465	-135.781	Good
4	58.33320	-135.733	Good
4	58.32700	-135.729	Good
4	58.32667	-135.796	Good
4	58.30988	-135.709	Good
4	58.31897	-135.770	Good
5	58.31509	-135.748	Extra
5	58.31300	-135.734	Extra
5	58.31638	-135.717	Extra
5	58.31203	-135.741	Good
5	58.32189	-135.733	Good
5	58.32426	-135.751	Good
5	58.32042	-135.741	Good
5	58.32578	-135.760	Good
5	58.30947	-135.730	Good
5	58.32211	-135.741	Good
5	58.32564	-135.777	Good
5	58.32665	-135.774	Good
5	58.31649	-135.723	Good
5	58.31491	-135.736	Good
5	58.32967	-135.767	Good
5	58.31659	-135.745	Good
5	58.32840	-135.775	Good
5	58.32345	-135.772	Good