

Regional Information Report No. 4K14-03

**Special Project Plan: 2014 Large-Mesh Bottom Trawl
Survey of Crab and Groundfish for Kodiak, Chignik,
South Peninsula, and Eastern Aleutian Districts**

by

Kally Spalinger

June 2014

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

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SURVEY OF CRAB AND GROUND FISH FOR KODIAK, CHIGNIK,
SOUTH PENINSULA, AND EASTERN ALEUTIAN DISTRICTS**

by
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Division of Sport Fish, Research and Technical Services
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June 2014

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ABSTRACT

This report specifies special project objectives and methods of Alaska Department of Fish and Game's (ADF&G) 2014 Kodiak, Chignik, South Peninsula, and Eastern Aleutian districts large-mesh bottom trawl survey of crab and groundfish. This Special Project Plan is used in conjunction with the operational plan for standard sampling (Spalinger *in prep*), which describes standard large-mesh trawl survey sampling. Special crab projects for 2014 include: measurement of male Tanner crab *Chionoecetes bairdi* chela height to determine size at maturity and an expansion of the South Peninsula survey to explore additional areas for Tanner crab presence. Special groundfish projects for 2014 include collection of stomachs and contents from walleye pollock *Gadus chalcogrammus*, Pacific cod *Gadus macrocephalus*, flathead sole *Hippoglossoides elassodon*, arrowtooth flounder *Atheresthes stomias*, Pacific halibut *Hippoglossus stenolepis*, northern rock sole *Lepidopsetta polyxystra*, and spiny dogfish *Squalus acanthias* for a National Marine Fisheries Service (NMFS) food habits study, and a rock sole species verification project to examine the accuracy of current on-deck identification methods. Additionally, samples from multiple species will be taken for an archaeological comparison project being conducted by University of British Columbia (UBC) and monitoring of the trawl net will occur throughout portions of the survey using net mounted sensors.

Key words: Tanner crab, shellfish, groundfish, trawl survey, Kodiak, Alaska Peninsula, Chignik, Eastern Aleutian Islands, special projects

INTRODUCTION

From June through September 2014, the Alaska Department of Fish and Game (ADF&G) will conduct a bottom trawl survey in waters of historic red king crab *Paralithodes camtschaticus* and Tanner crab *Chionoecetes bairdi* abundance around Kodiak Island and south of the Alaska Peninsula from Cape Douglas to False Pass, as well as around the Eastern Aleutian Islands (Figure 1). Survey results will be used to estimate abundance, sex composition, and maturity of Tanner crab and red king crab and determine species composition and length frequencies of groundfish catch by haul and area.

This report details the survey schedule, station boundaries, and sampling methods for special projects during the 2014 trawl survey. Standard sampling methods during the bottom trawl survey are described in the operational plan (Spalinger *in prep*). Changes to standard procedures, or special projects associated with the 2014 survey are described in this document.

OBJECTIVES

Objectives for shellfish special projects during the 2014 large-mesh bottom trawl survey are:

1. Measure male Tanner crab chela height from the Northeast, Eastside, and Westside sections of the Kodiak District;
2. Expand the South Peninsula District survey by 24 to 40 hauls in waters south of Unimak Island and east to Umga Island and estimate Tanner crab abundance in the area.

Objectives for groundfish special projects during the 2014 large-mesh bottom trawl survey are:

1. Collect whole stomachs and stomach contents from walleye pollock *Gadus chalcogrammus*, Pacific cod *Gadus macrocephalus*, flathead sole *Hippoglossoides elassodon*, arrowtooth flounder *Atheresthes stomias*, Pacific halibut *Hippoglossus stenolepis*, northern rock sole *Lepidopsetta polyxystra*, and spiny dogfish *Squalus acanthias* from Marmot and Chiniak bays;
2. Verify the accuracy of on-deck rock sole speciation methods.

Additional special project objectives for the 2014 large-mesh bottom trawl survey are:

1. Collect tissue samples from Dungeness crab *Cancer magister*, black rockfish *Sebastes melanops*, dark rockfish *Sebastes ciliatus*, dusky rockfish *Sebastes variabilis*, greenling *Hexagrammos* spp., Pacific cod, Tanner crab, and octopus *Octopus dofleini* from Chiniak and Kazakof bays.
2. Deploy and record data from net monitoring sensors throughout portions of the 2014 survey.

METHODS

SURVEY AREA

The 27.4 m ADF&G research vessel *Resolution* will conduct survey hauls using a 400-mesh eastern otter trawl in areas of king crab and Tanner crab habitat in the Kodiak, Chignik, and South Peninsula districts (Figure 1, Appendices A1–A12). In the Eastern Aleutian District Akutan, Unalaska, Makushin, and Pumicestone bays will be included in the 2014 survey if time and funding are available (Appendices A13 and A14).

NET MONITORING

Beginning in the Northeast Section of the Kodiak District, Simrad PI44 bottom contact, depth, and wing spread sensors will be deployed on the trawl net. Mounting hardware must be built into each trawl net prior to deployment. The bottom contact sensor should be attached to the middle of the footrope and one spread/depth sensor should be attached to each wing tip. Data will be transmitted from the sensors to a hull mounted transducer and recorded to an Access database in the wheelhouse during each haul. If deployment is successful (i.e. data is recorded with seemingly few issues) the sensors will be deployed throughout the survey as determined by cruise leaders.

CRAB SAMPLING

Male Tanner Crab Chela Height

Male Tanner crab chela height measurements will be collected from the Northeast, Eastside and Westside sections of the Kodiak District (Appendices A2, A3, and A8). Protocol for chela height measurement will follow the procedures in the standard protocol operational plan (Spalinger *in prep*). The cruise leader may adjust the sampling plan as needed to accommodate high numbers of crab encountered on the Eastside survey and allow for timely return of crab to the water. Cruise leaders will detail exact sampling procedures for each haul so data analysis can be conducted accordingly. Chela height to carapace width ratio will determine size at morphometric maturity of male Tanner crab and will be compared with morphometric maturity from different areas and years.

South Peninsula Survey Expansion

The 2014 South Peninsula District trawl survey will occur during July and August in areas of known Tanner crab habitat consistent with past trawl surveys (Appendices A8-A9). However, Tanner crab may occur in areas not currently assessed by the survey. This project will expand trawl sampling in 2014 to waters south and east of Unimak Island which are not included in the standard survey (Figure 2).

Between 24 and 40 additional large-mesh survey hauls will be conducted in areas outside of the existing annual trawl survey, in waters south of Unimak Island and east to Umga Island (Figure 2). The skipper, in consultation with the cruise leader, will determine which stations will be towed taking into consideration factors such as bathymetry, substrate type, time available, and weather conditions. Catch from these hauls will be sampled and summarized using standard protocols (Spalinger *in prep*). Tanner crab abundance in the expanded survey area will be estimated. Survey results will be provided to the Aleutians East Borough to determine if the area warrants future survey consideration and funding.

GROUNDFISH SAMPLING

Stomach Collection

Stomachs and stomach contents from walleye pollock, Pacific cod, flathead sole, arrowtooth flounder, Pacific halibut, northern rock sole, and spiny dogfish will be collected in Marmot and Chiniak bays (Appendices A1 and A2). Sample sizes are 15 to 40 stomachs depending on species size group (Appendix B1), with a maximum number of 20 stomachs per species per haul. The goal is to sample two to three species from every haul (Appendix B2). Samples will be sent to the NMFS Food Habits Laboratory in Seattle, WA where they will be examined and data included in an ongoing food habits study.

Rock Sole Identification

Rock sole data from the ADF&G large-mesh trawl survey is used by NMFS in their assessment of Gulf of Alaska rock sole. Data supplied to NMFS includes abundance by species, requiring ADF&G to identify Northern and Southern species. This project will provide information to examine the accuracy of on-deck identification methods and determine if changes are needed.

Current on-deck methods to speciate rock sole rely upon blind side skin characteristics (Byersdorfer and Watson 2010; Appendix C1). Although gill rakers can be used to differentiate these species gill rakers are rarely examined. Gill rakers are situated along the front side of the gill arch, which is divided into upper and lower limbs (Appendix C2). They are counted on the first gill arch, from top to bottom, with the gill raker at the junction of the two limbs included in the lower limb count. Northern rock sole typically have 10 or more slender, pointed gill rakers on the first arch with 3 or more of those on the upper part of the arch. Southern rock sole typically have 10 or less broader, more robust gill rakers on the first arch with 3 or less of those on the upper part of the arch (Orr and Matarese 2000).

At the discretion of the cruise leader the following procedure will be followed to verify the accuracy of using blind side skin characteristics to identify rock sole.

1. Crew: Sort rock sole normally, using blind side skin characteristics.
2. Cruise Leader:
 - a. Separate up to 30 fish from each species and set aside
 - i. Weigh and dump the rest, recording the weights as “unmeasured weights”.
 - b. Weigh the separated fish by species. Record weights as “measured weights”.
 - c. Identify each fish using gill raker counts
 - d. Weigh the re-sorted fish. Record counts and weights on form in “measured weights” column (Appendix C3).
 - e. Measure all re-sorted fish by species.

SPECIMEN COLLECTION

Tissue samples of Dungeness crab *Cancer magister*, black rockfish *Sebastes melanops*, dark rockfish *Sebastes ciliatus*, dusky rockfish *Sebastes variabilis*, greenling *Hexagrammos* spp., Pacific cod, Tanner crab, and octopus *Octopus dofleini* will be collected in 2014 for the University of British Columbia from Chiniak and Kazakof bays (Appendices A1 and A2). Within each bay samples from 5 to 10 individuals of each species will be collected if available. Fish samples will consist of a fin with some flesh attached, crab samples will consist of a portion of a leg including shell and meat, and octopus samples will be the end of a tentacle. Samples will be put in a bag containing a completed specimen form (Appendix D1) and frozen. After the survey, samples will be removed from the vessel and arrangements will be made to ship them to the university.

DATA FORMS AND SAMPLE CUSTODY

The cruise leader will ensure all samples and data forms are completed and removed from the research vessel after each survey leg, including downloading electronically collected data to the vessel's dryhold computer and making backup copies of all electronic data by copying to an external hard drive, USB flash drive, or other location. For projects continuing on the next survey leg, samples and data forms will be organized, labeled, and dry. Forms will be stored in a binder according to project and ordered sequentially by haul. Sampling tallies and logs will be complete and placed in the binder for reference. Data removed from the vessel should be taken directly to Kally Spalinger, the lead trawl-survey biologist. Frozen samples must be labeled prior to removal from the R/V *Resolution* and transferred to either the ADF&G warehouse freezer or the walk in freezer in the ADF&G lab. Samples preserved in formalin must be stored outside, in a vented container, or in a designated hazardous materials storage location until shipped. Samples should be protected from high temperatures and freezing. It is important to inform the lead trawl-survey biologist of the location of all stored samples.

SPECIAL PROJECT EQUIPMENT CHECKLIST

Groundfish stomach sampling

- Specimen forms or Allegro rugged handheld computer if entering data on deck
- Specimen labels
- Tally sheets
- Five-gallon buckets with lids (10-12)
- 4 gallons Formalin
- Stomach bags
- One-liter plastic bottles
- Baking soda
- Luggage tags
- 1/8 cup measuring cup
- Safety glasses
- Hazardous materials bucket

South Peninsula survey expansion

- Nautical chart of the area to be explored
- Additional survey nets

Net monitoring

- Spread/depth sensors (2)
- Bottom contact sensor (1)
- Battery charger with cable
- Wheelhouse monitor
- Computer in wheelhouse containing the ITI access database to record data

Sample collection for UBC

- Ziploc bags
- Specimen collection forms

PERSONNEL AND SURVEY SCHEDULE

R/V Resolution crew – Captain Daniel Wilson, Gary Wilson, Joy Brooks

*Chiniak Bay –
June 12 and 13*

Kally Spalinger (cruise leader)
Collin Hakkinen
Sherry Barker
David Gilliland

*Marmot Bay –
June 17 to 21*

Kally Spalinger (cruise leader)
Collin Hakkinen
Sherry Barker
David Gilliland
Kim Phillips

*Eastside Kodiak –
June 25 to July 12*

Kally Spalinger (cruise leader)
Collin Hakkinen
Sherry Barker
David Gilliland
Paul Converse

*South Alaska Peninsula, Chignik,
and Eastern Aleutian –
July 17 to August 26*

Trent Hartill (cruise leader 1st ½)
Mark Stichert (cruise leader 2nd ½)
Collin Hakkinen
Sherry Barker
David Gilliland
Melissa Good (Aleutian)

*Westside Kodiak and North Mainland –
September 2 to 12*

Kally Spalinger (cruise leader)
Collin Hakkinen
Sherry Barker
David Gilliland

REFERENCES CITED

- Byersdorfer, S. C., and L. J. Watson. 2010. Field guide to common marine fishes and invertebrates of Alaska. Alaska Sea Grant College Program, University of Alaska Fairbanks, Fairbanks, Alaska.
- Orr, J. W., and A. C. Matarese. 2000. Revision of the genus *Lepidopsetta* Gill, 1862 (*Teleostei: Pleuronectidae*) based on larval and adult morphology, with the description of a new species from the North Pacific Ocean and Bering Sea. *Fish. Bull.* 98: 539-84.
- Spalinger, K. *In prep.* Operational Plan: Large-Mesh Bottom Trawl Survey of Crab and Groundfish: Kodiak, Chignik, South Peninsula, and Eastern Aleutians Management Districts – Standard Sampling Protocol. Alaska Department of Fish and Game, Division of Commercial Fisheries.

FIGURES

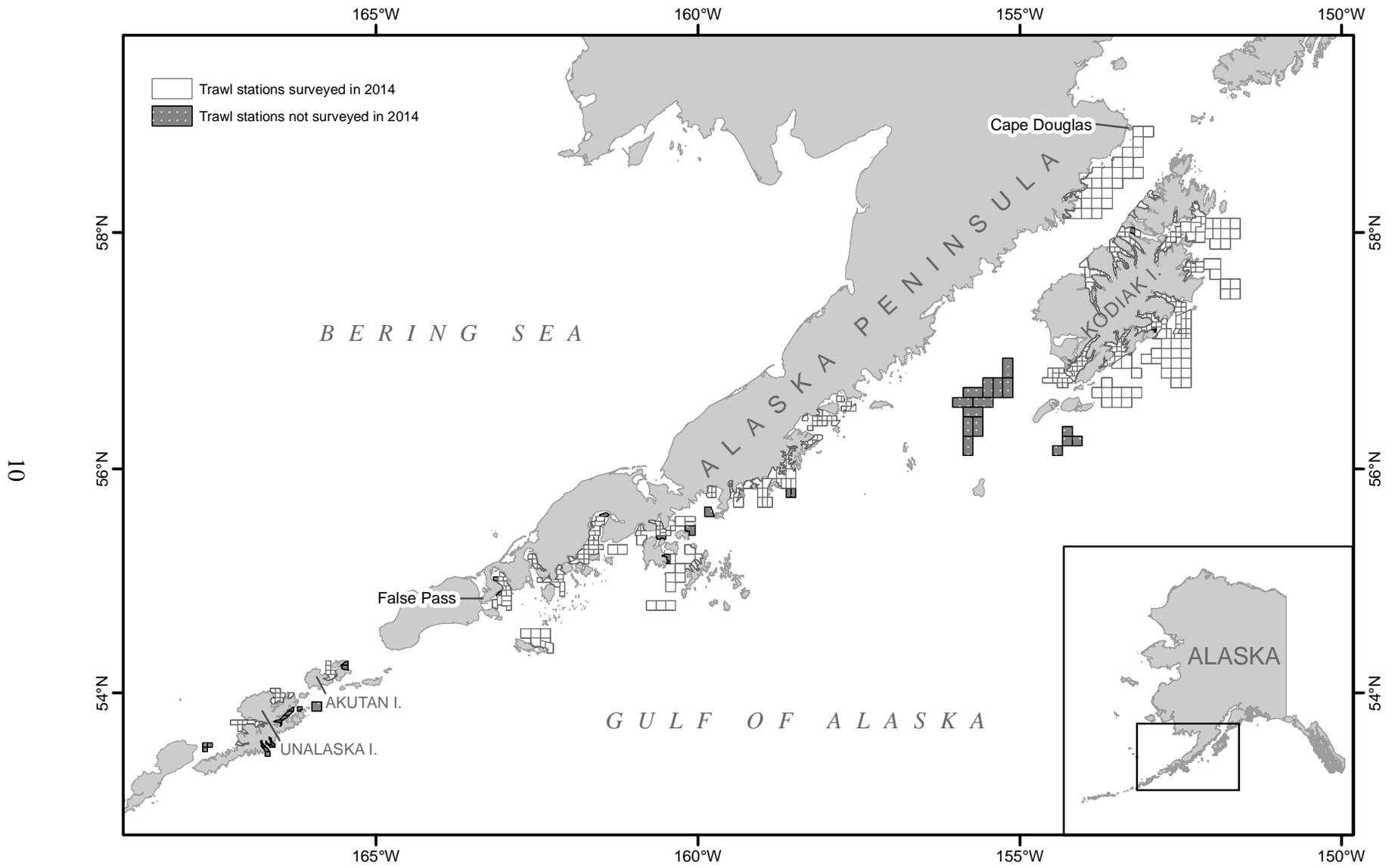


Figure 1.—Trawl survey locations, 2014.

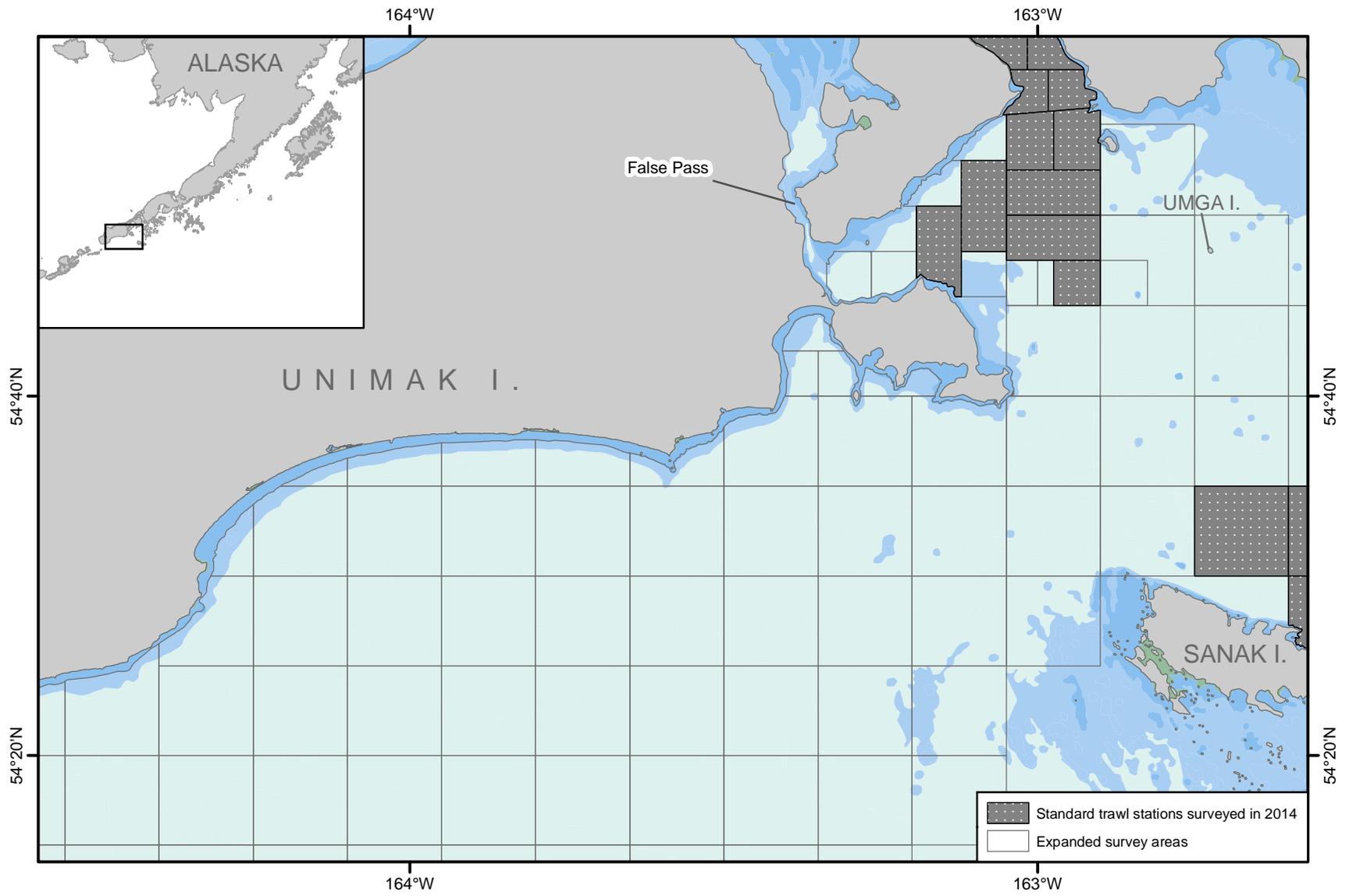
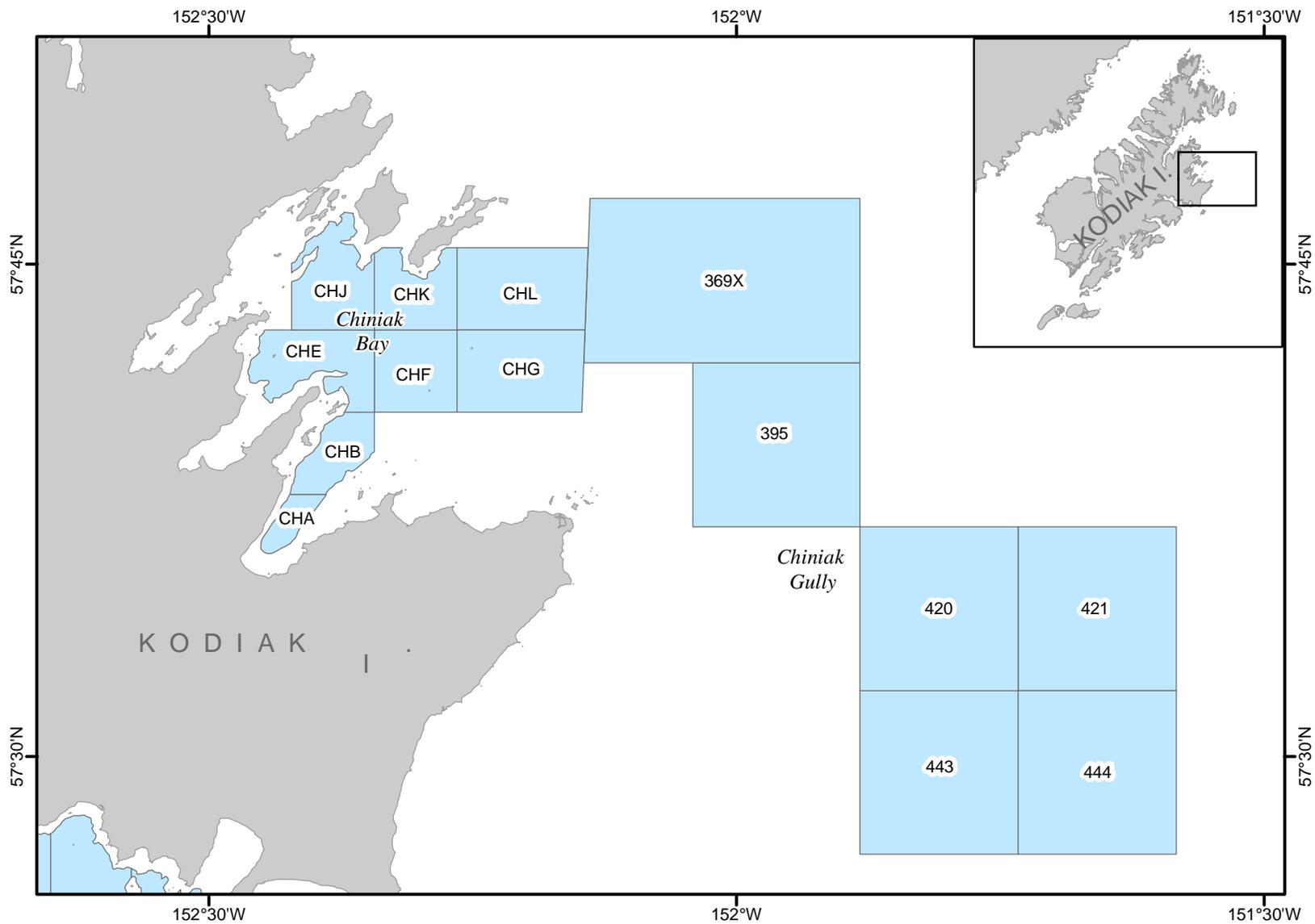


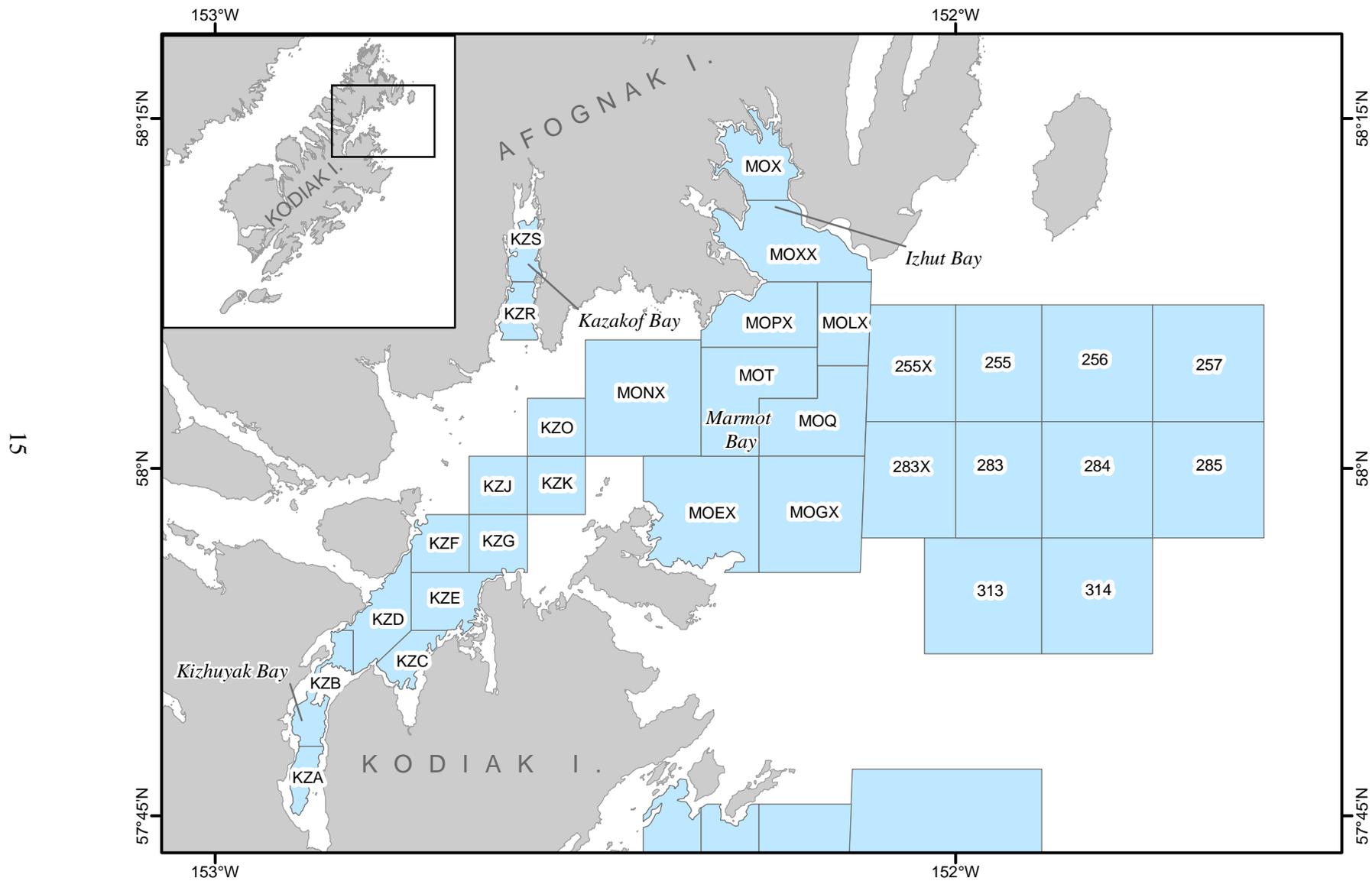
Figure 2.—Expanded survey area in South Peninsula District.

APPENDIX A. TRAWL SURVEY STATION MAPS

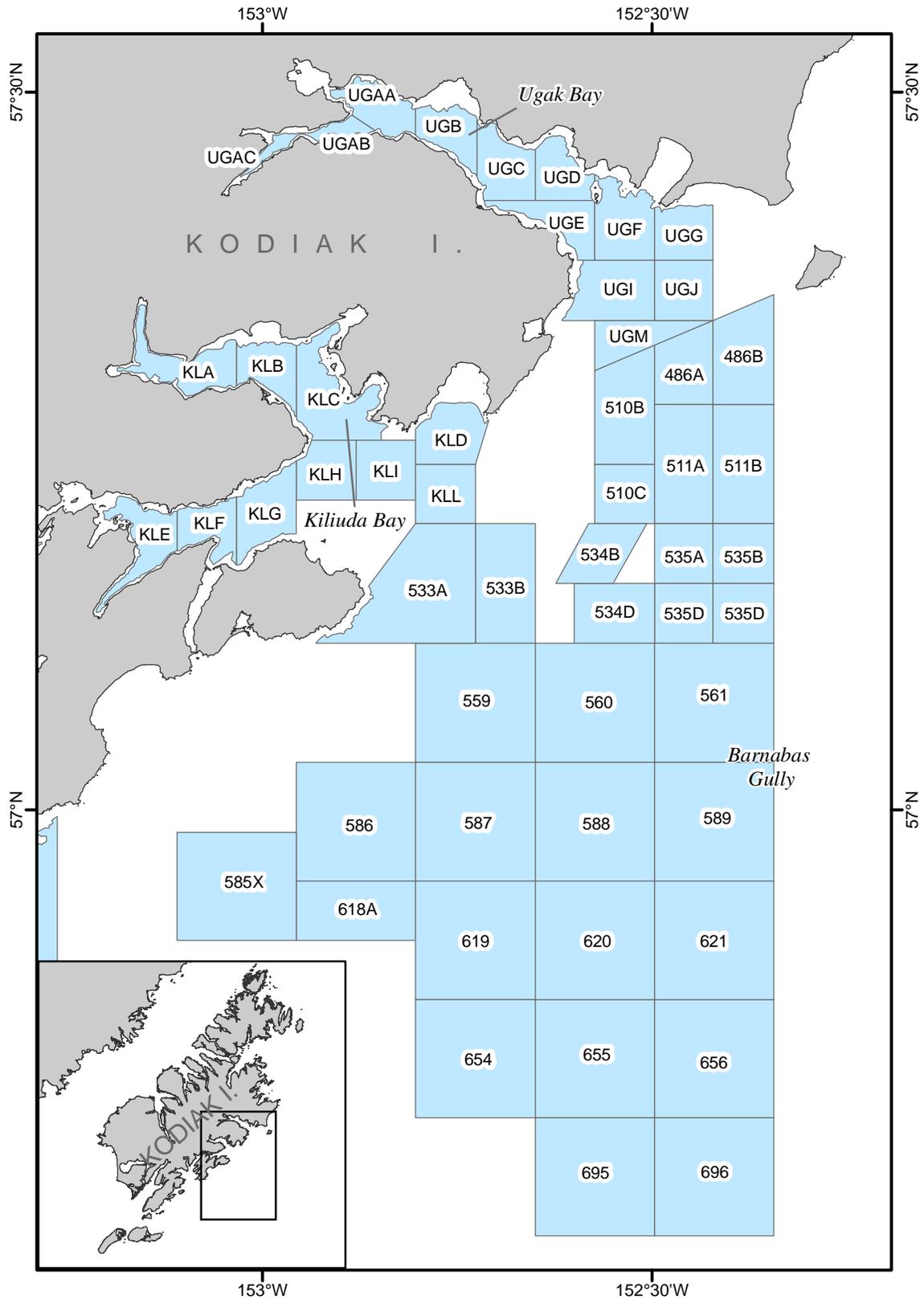
Appendix A1.—Station boundaries and names, Chiniak Bay and Chiniak Gully, 2014 Kodiak District trawl survey.



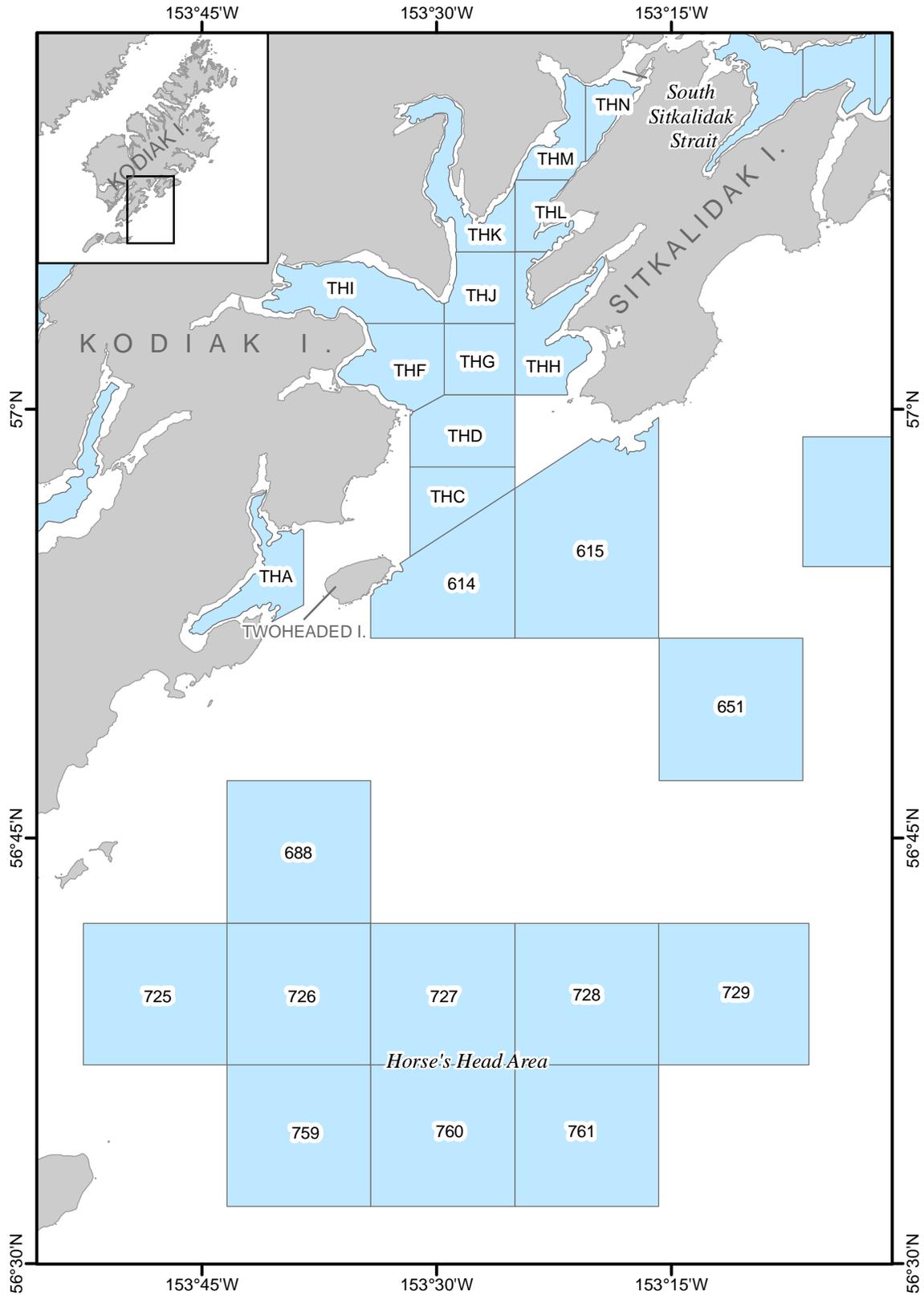
Appendix A2.—Station boundaries and names, Izhut, Kazakof, Kizhuyak, and Marmot bays, 2014 Kodiak District trawl survey.



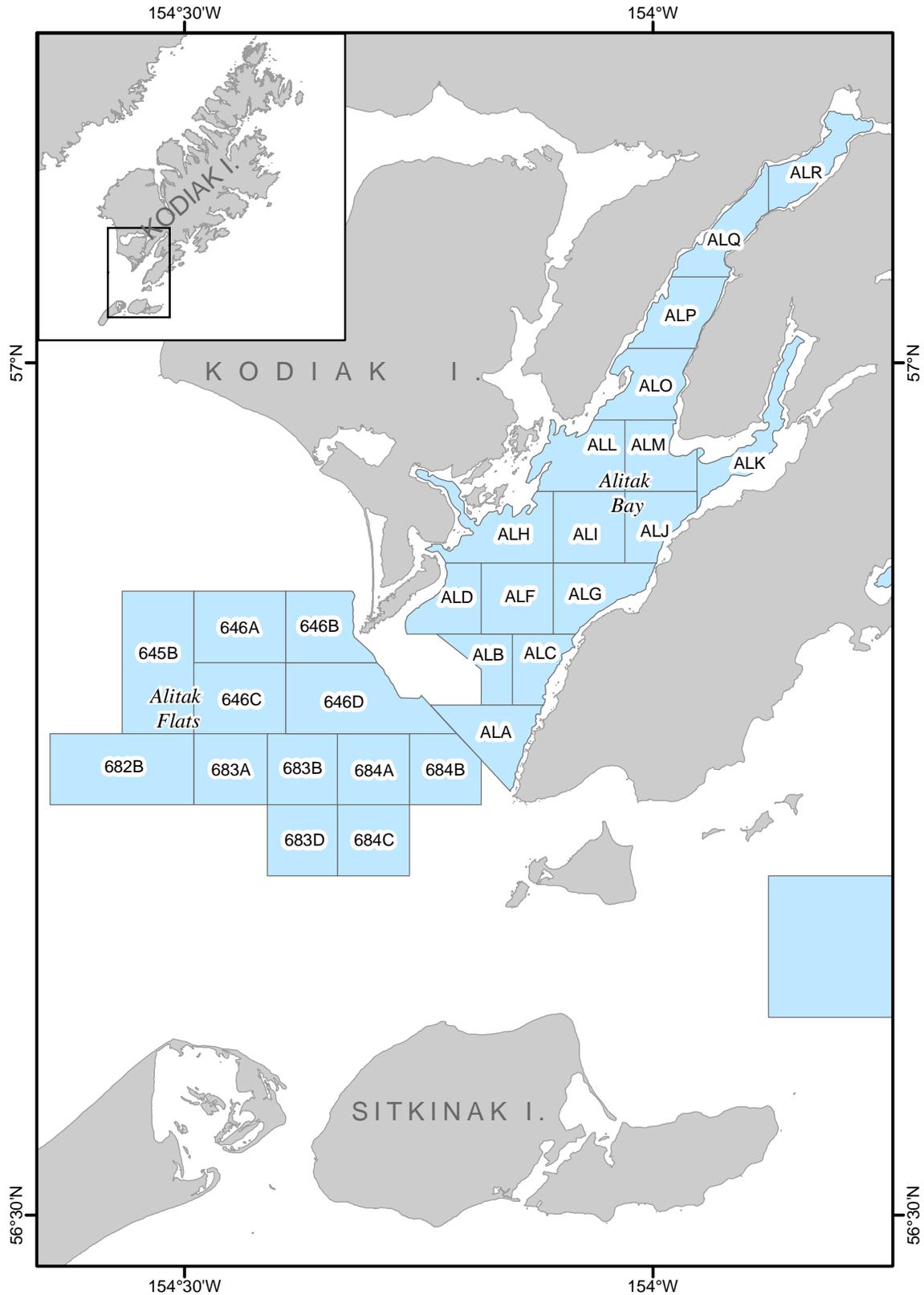
Appendix A3.—Station boundaries and names, Ugak Bay, Kiliuda Bay, and Barnabas Gully, 2014 Kodiak District trawl survey.



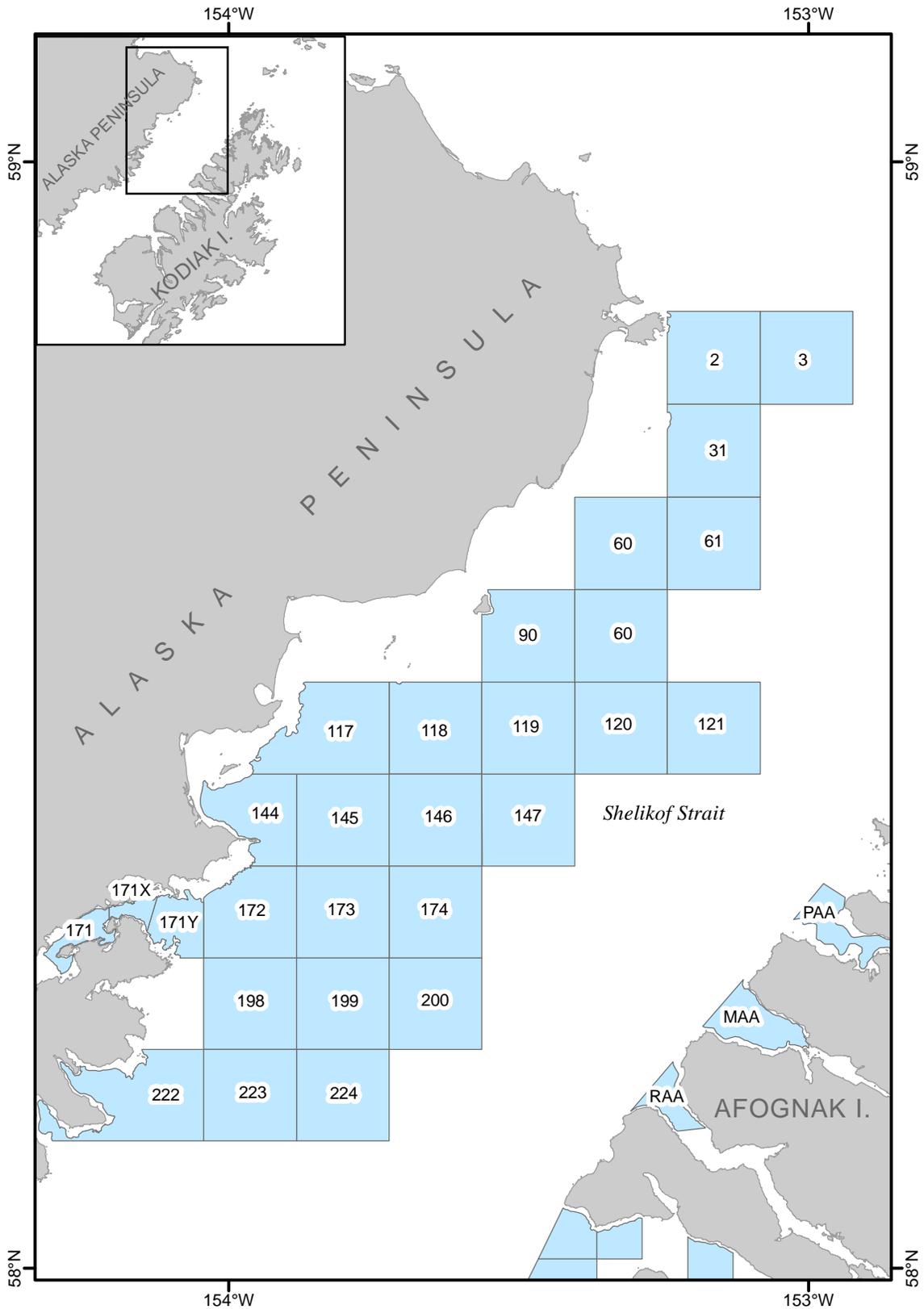
Appendix A4.—Station boundaries and names, South Sitkalidak Strait, Two Headed Island, and Horse’s Head area, 2014 Kodiak District trawl survey.



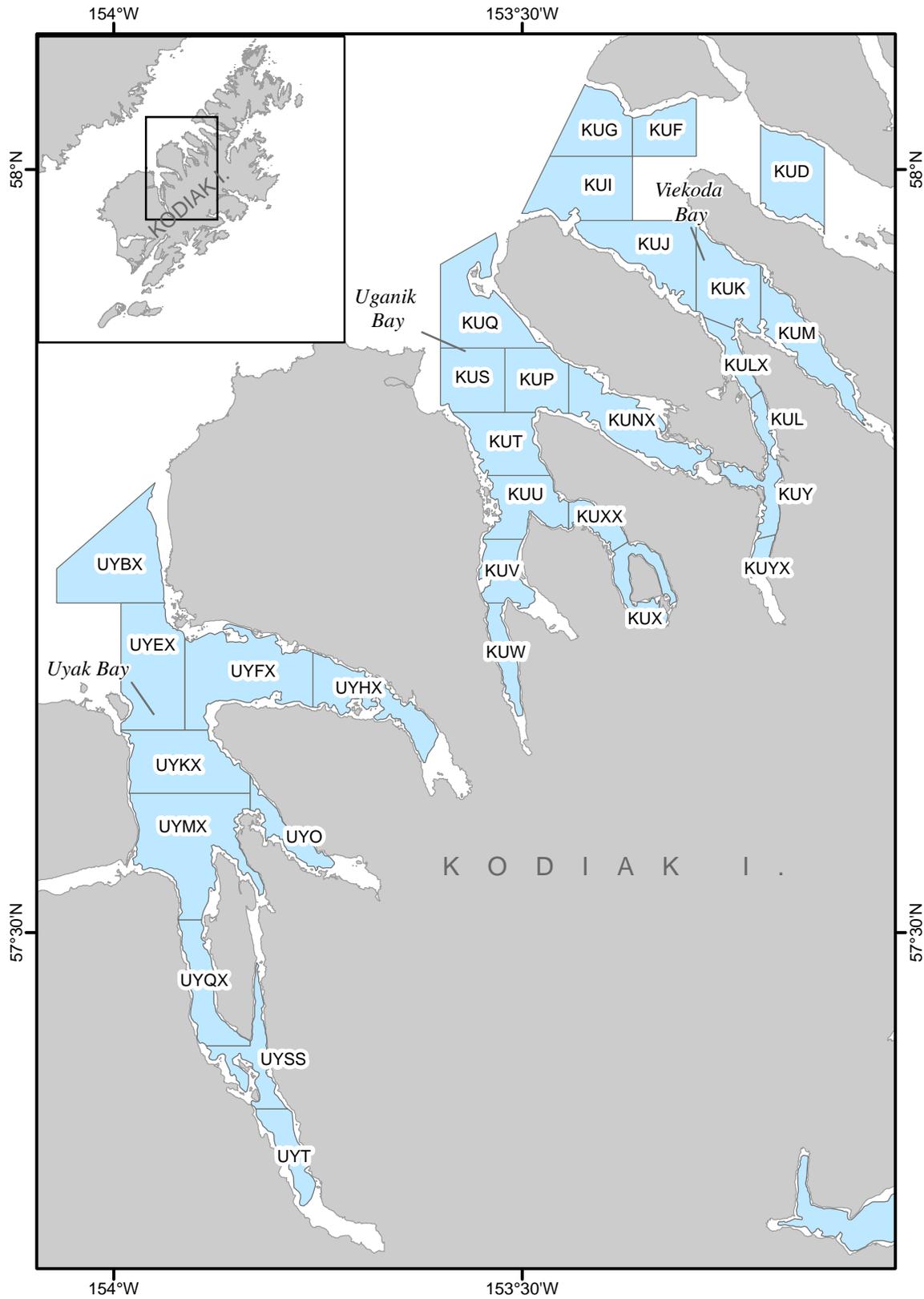
Appendix A5.—Station boundaries and names, Alitak Bay and Alitak Flats, 2014 Kodiak District trawl survey.



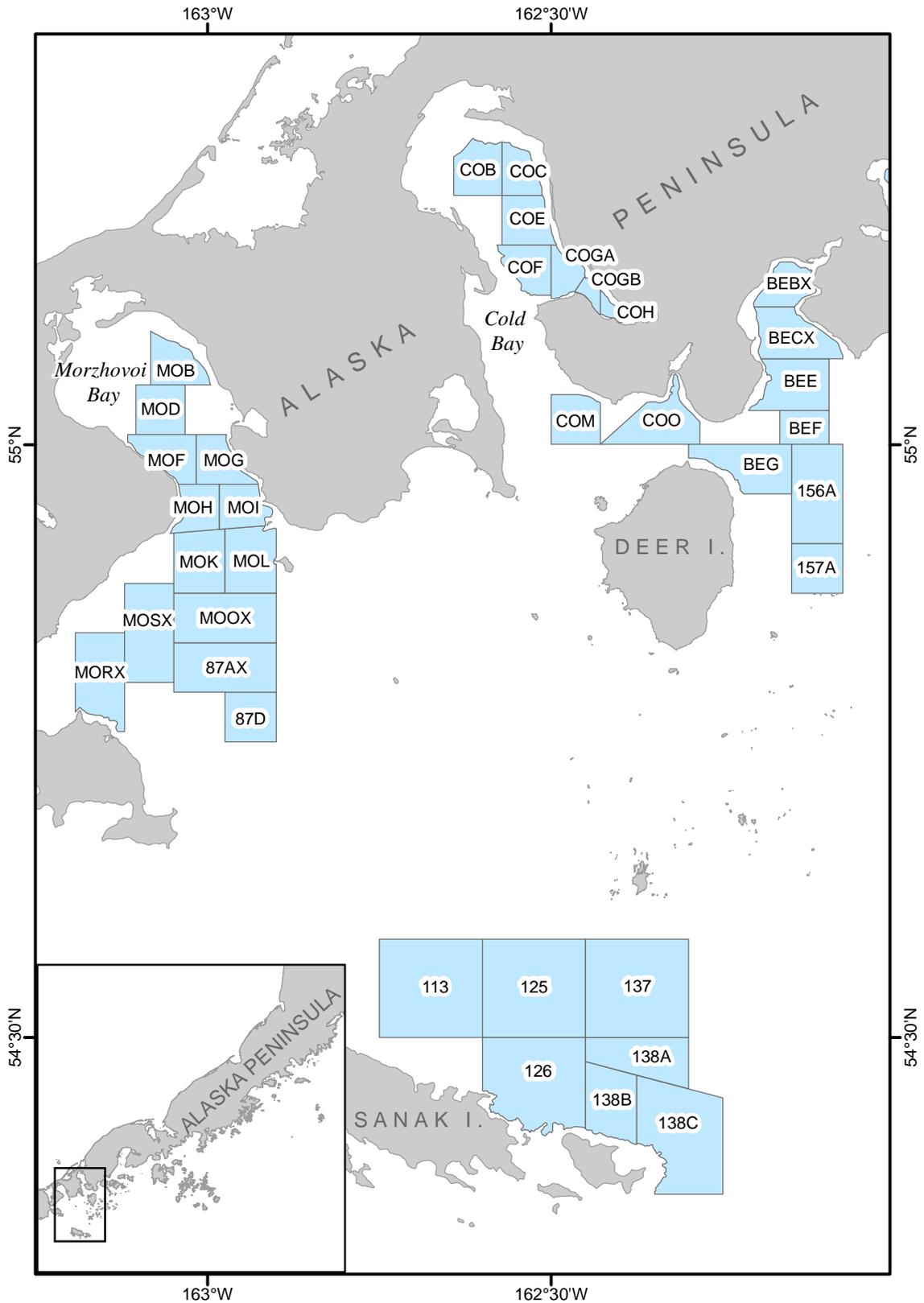
Appendix A6.—Station boundaries and names, Shelikof Strait and Afognak Island, 2014 Kodiak District trawl survey.



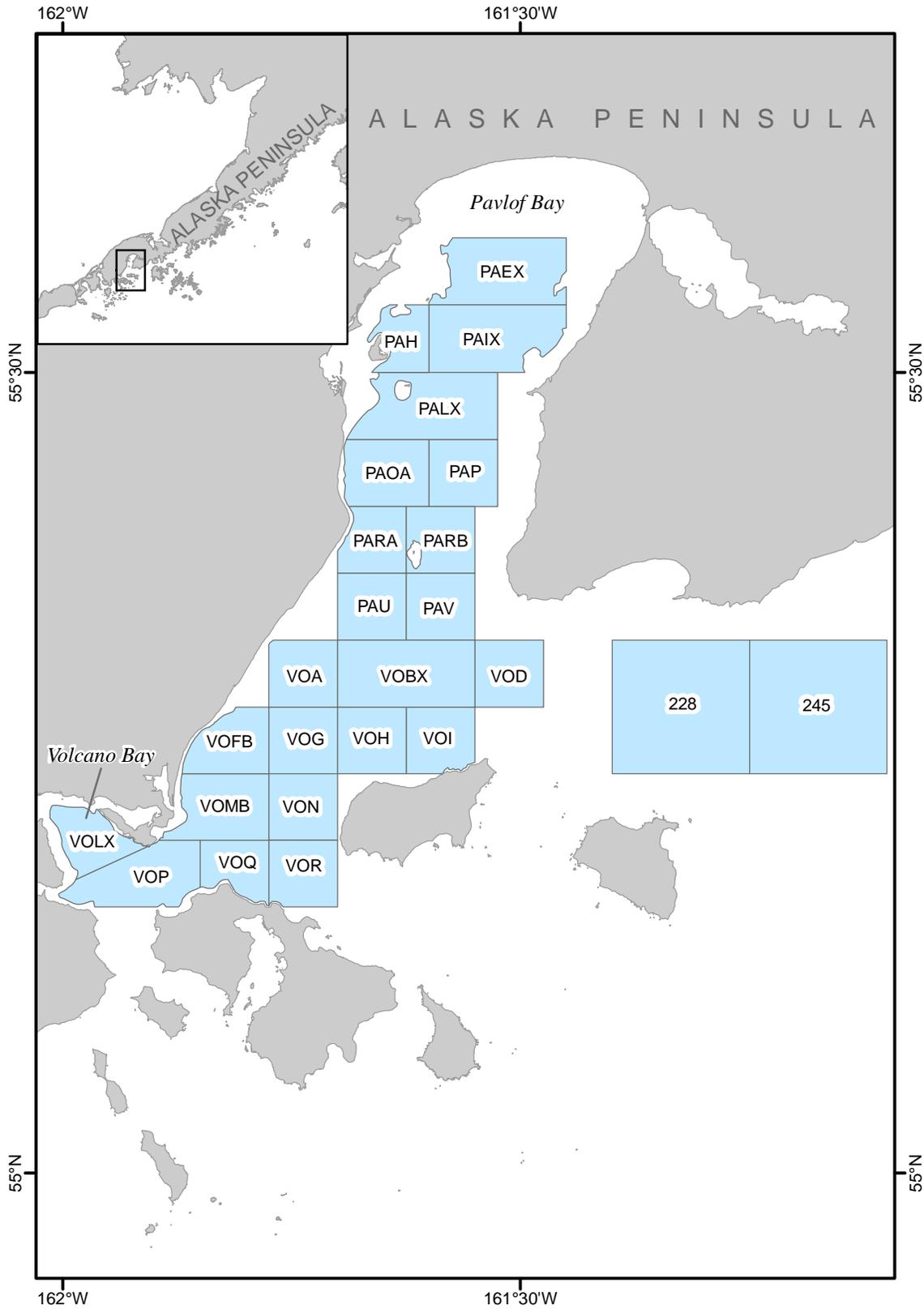
Appendix A7.—Station boundaries and names, Uyak, Uganik, and Viekoda bays, 2014 Kodiak District trawl survey.



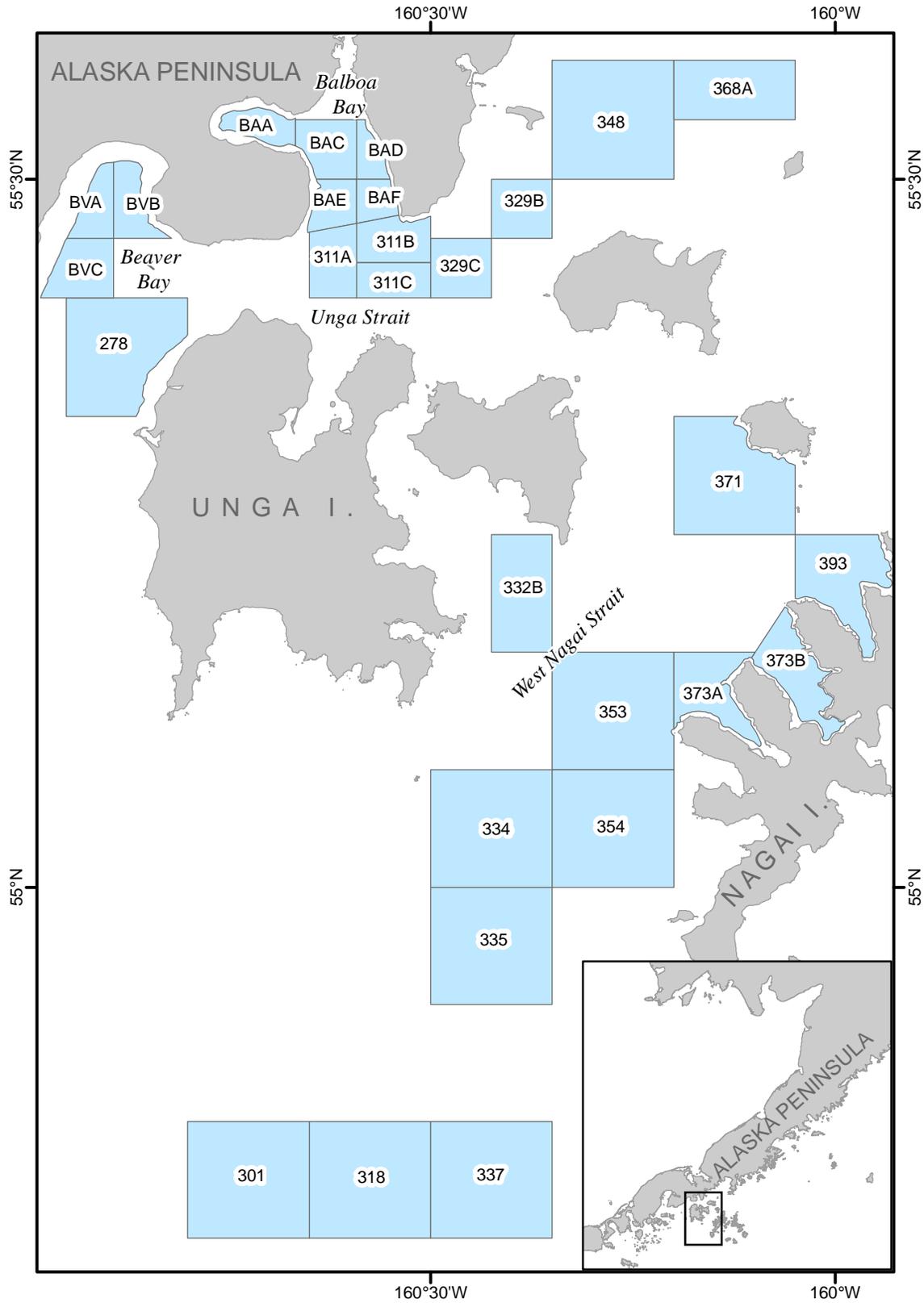
Appendix A8.—Station boundaries and names, Morzhovoi Bay, Cold Bay, Deer Island, and Sanak Island, 2014 South Peninsula District trawl survey.



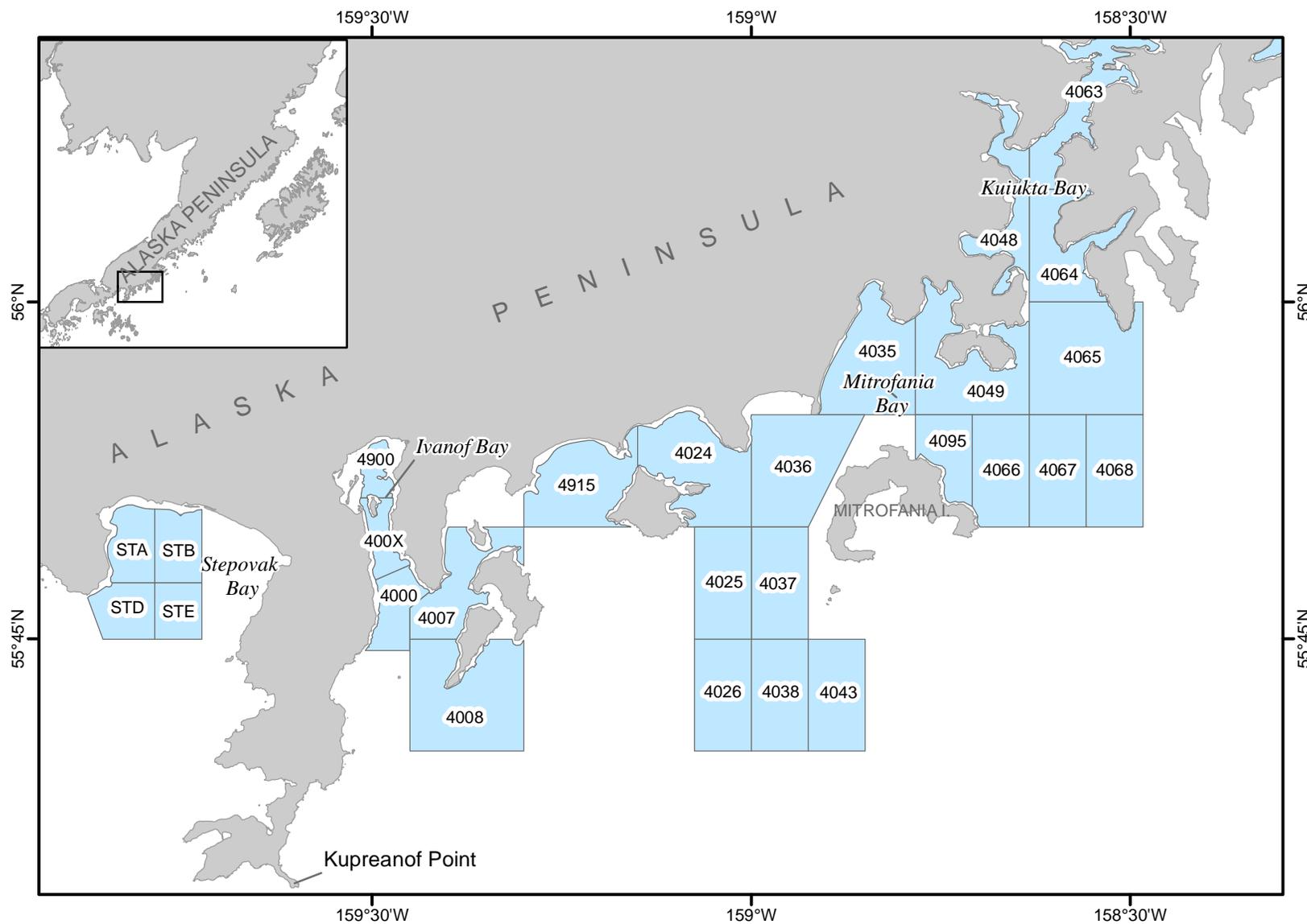
Appendix A9.—Station boundaries and names, Pavlof and Volcano bays, 2014 South Peninsula District trawl survey.



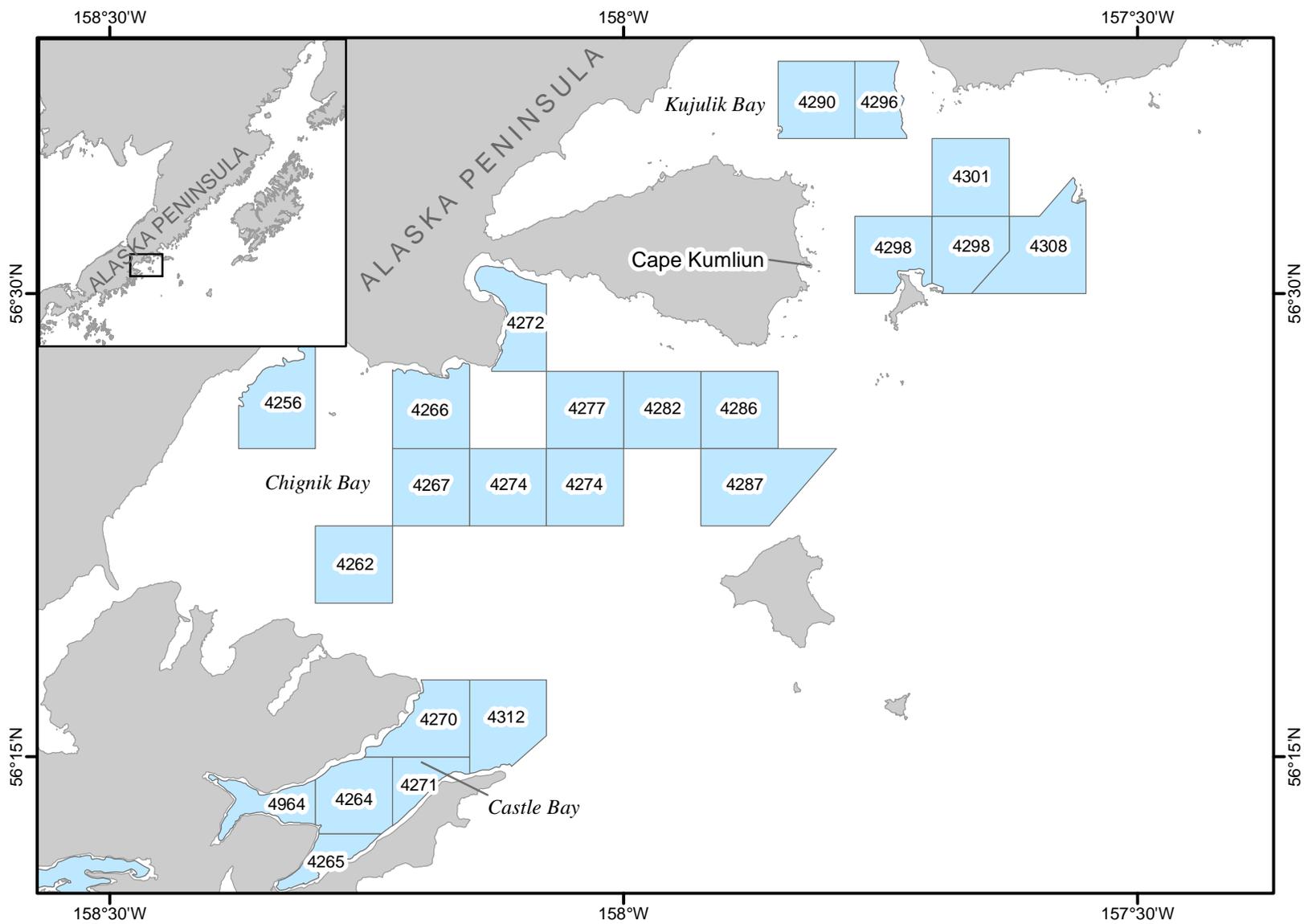
Appendix A10.—Station boundaries and names, Unga Strait, Beaver Bay, Balboa Bay, and West Nagai Strait, 2014 South Peninsula District trawl survey.



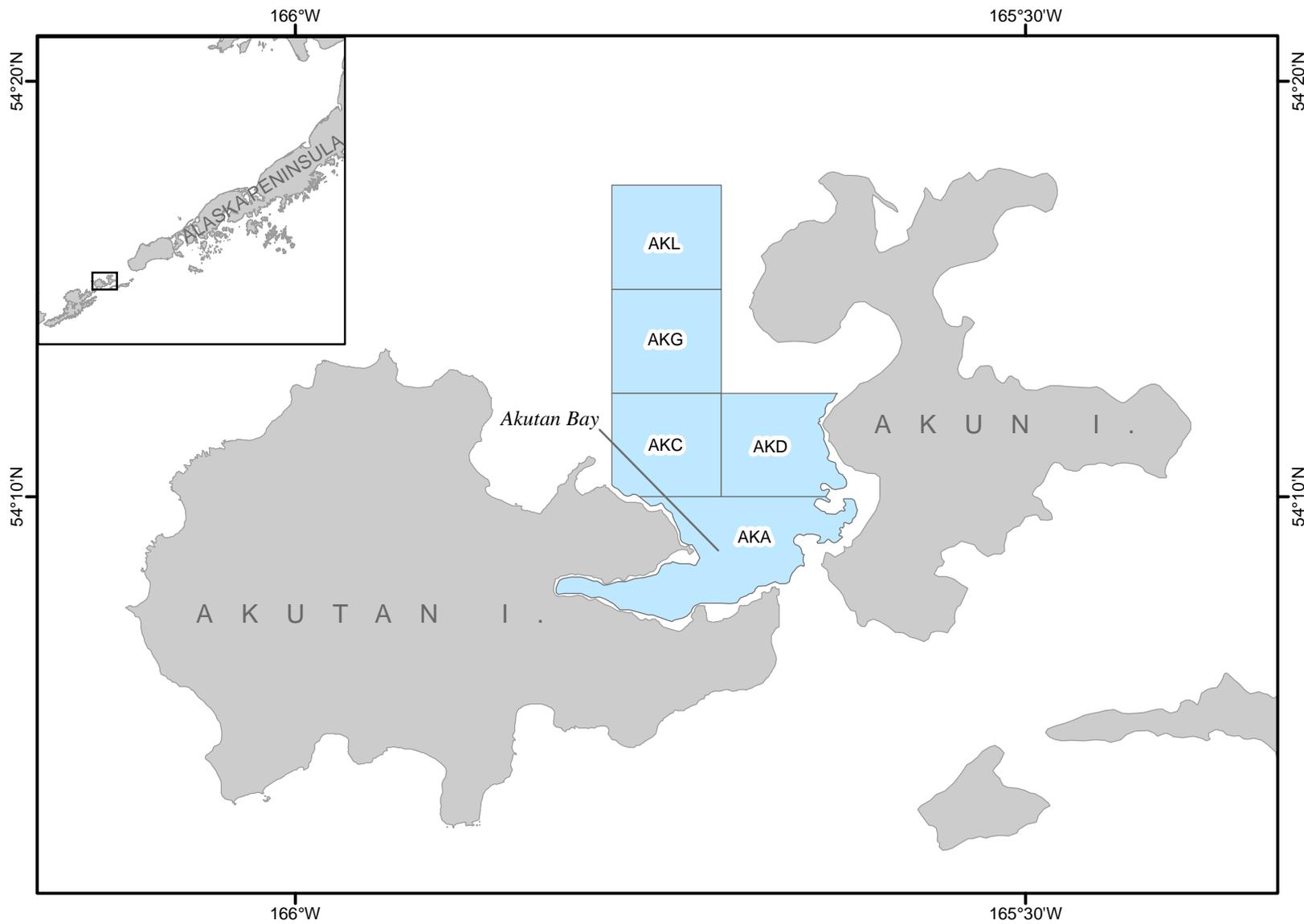
Appendix A11.—Station boundaries and names, Stepovak, Ivanof, Mitrofanía, and Kuiukta bays, 2014 South Peninsula and Chignik District trawl survey.



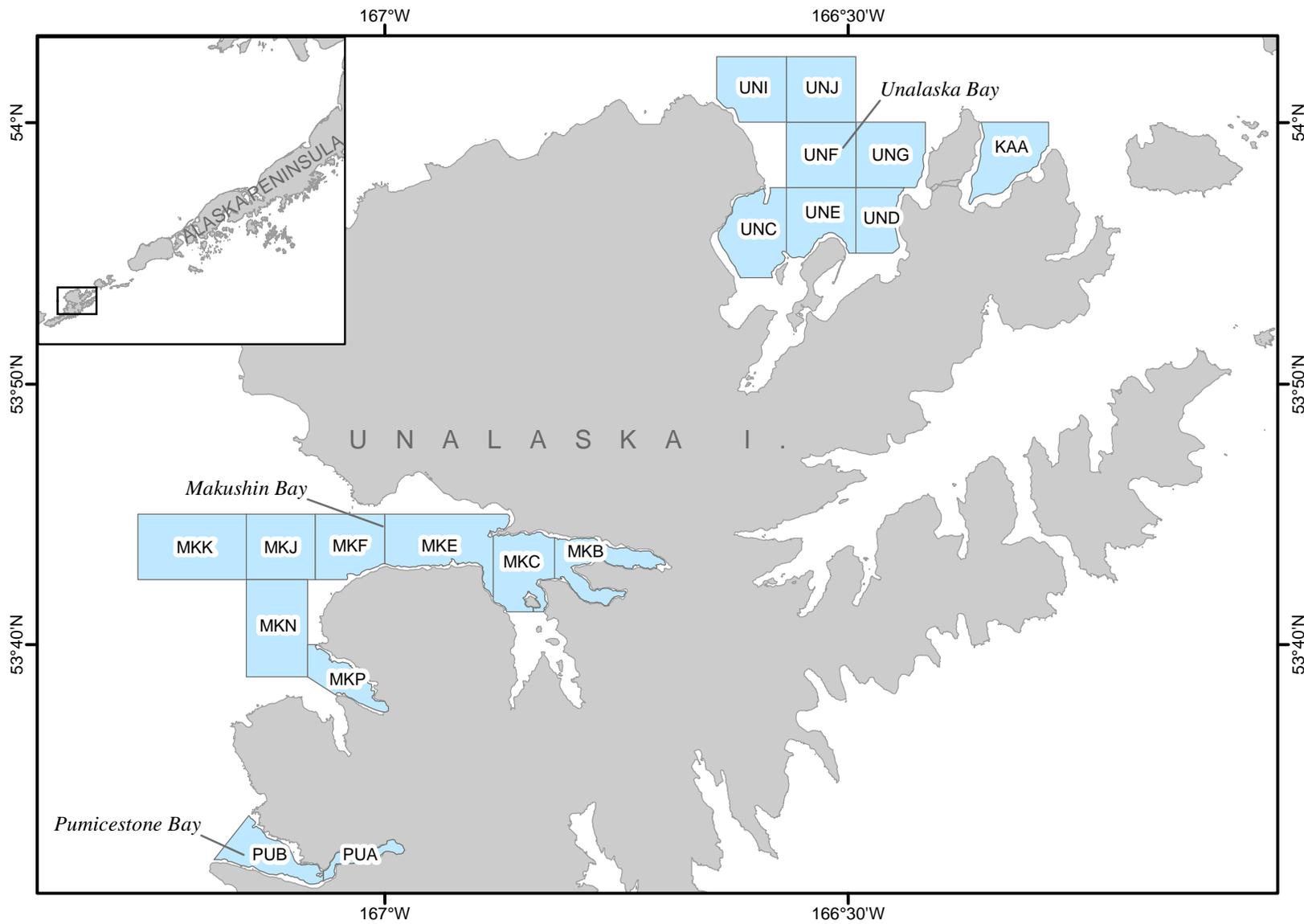
Appendix A12.—Station boundaries and names, Kujulik, Chignik, and Castle bays, 2014 Chignik District trawl survey.



Appendix A13.—Station boundaries and names, Akutan Bay, 2014 Eastern Aleutian District trawl survey.



Appendix A14.—Station boundaries and names, Unalaska, Makushin, and Pumicestone bays, 2014 Eastern Aleutian District trawl survey.



**APPENDIX B. GROUND FISH STOMACH SAMPLING
PROTOCOL**

Appendix B1.—Number of groundfish stomach samples, by species and size groups (cm), 2014 Chiniak and Marmot bays survey.

Species	Number	Species	Number
Walleye pollock		Arrowtooth flounder	
< 30 cm	20	< 30 cm	40
30-44	20	30-49	40
45-54	40	≥ 50	40
≥ 55	40	total	120
total	120		
Pacific cod		Pacific halibut	
< 30 cm	20	< 40 cm	15
30-44	20	40-54	15
45-59	40	55-69	30
≥ 60	40	≥ 70	30
total	120	total	90
Flathead sole		Northern rock sole	
< 20 cm	20	< 20 cm	20
20-39	20	20-39	20
≥ 40	20	≥ 40	20
total	60	total	60
Spiny dogfish			
< 40 cm	20		
40-79	20		
≥ 80	20		
total	60		

Appendix B2.–2014 Chiniak and Marmot bays groundfish stomach sampling protocol.

At every haul, after entire catch has been dumped in the checker bin and major species are evident, choose two to three species from Appendix B1 which are abundant enough for stomach sampling purposes (about one full basket). With the concurrence of sorting crew, designate which specimens are to be set aside for stomach dissection after baskets have been weighed and recorded. Set baskets in a cool, shaded area until entire catch has been processed.

Sampling procedures:

- (1) Collect fish that show **no** sign of either net feeding or regurgitation.
*Signs of net feeding and regurgitation (DO NOT KEEP THESE):
 - prey items in mouth or gill rakers
 - flaccid (loose and bloated) looking stomach*Signs of "natural" stomachs (KEEP THESE!):
 - naturally empty stomachs appear tight and contracted
 - stomachs appear tight around any prey inside
- (2) If the fish is collectable, measure fork length, determine sex and spawning condition, excise the stomach and place in a stomach bag with a specimen label. Try to collect 5 specimens from each size group (e.g. collect 5 stomachs from each of the <30 cm, 30-44 cm, 45-54 cm, and ≥55 cm pollock) in one haul. For small fish (≤20 cm), do not excise the stomach but instead make a slit in the body cavity to allow penetration of Formalin to the gut. Place the sample of whole fish in a large stomach bag with a label. Submerge sample in a bucket of 10% buffered Formalin. To make the Formalin solution, fill a 5-gallon bucket about half full with sea water, then add one liter 37% Formalin to the bucket. Add one rounded 1/8 cup of baking soda per bucket.
- (3) Each stomach bag should contain a specimen label which records species, vessel, cruise, haul, specimen number, fork length of the fish, sex, and spawning condition (spawning=1 or not spawning=0).
- (4) For each species, start specimen number at "1" and assign a number consecutively until the end of the cruise.
- (5) A specimen form is also filled out for each species in each haul. The specimen form should record the species, vessel, cruise, haul, fork length, sex, spawning condition (spawning or non-spawning), date, and specimen number (individual fish weight does not have to be taken).
- (6) Use broken lids to cover the bucket each time you add stomach collections into it. Seal the bucket (by using the unbroken lid) only when the bucket is full or at the end of the cruise.
- (7) Put different species collections in different buckets. Use permanent mark pen to write species name, vessel, address (National Marine Fisheries Service, Food Habits Lab, Bldg. 4, 7600 Sand Point Way NE, Seattle, WA 98115-0070) on the unbroken lid each time you seal a bucket.
- (8) When the cruise is over, please double-check that lids are completely labeled and add a luggage tag to the bucket handle. The luggage tag should indicate '2014, Marmot Bay (location), pollock (species), Resolution (boat), and your name'.
- (9) Collect at least 20 stomachs per haul, and you can reach the goal.

End of the Cruise:

At the end of the cruise, buckets (along with the specimen forms) and remaining equipment should be taken off the vessel and delivered to NMFS, Kodiak Laboratory. Inform Mei-Sun Yang or Geoff Lang and they will make arrangements to ship to Seattle.

APPENDIX C. ROCK SOLE IDENTIFICATION

Appendix C1.–Blind side skin characteristics of northern and southern rock sole.

Northern rock sole: Uniformly creamy white blind side.



Southern rock sole: Blind side with extensive white highlights along muscle bands.



Appendix C2.-Gill raker anatomy.

Gill rakers are situated along the front side of the gill arch, which is divided into upper and lower limbs. They are counted on the first gill arch, from top to bottom, with the gill raker at the junction of the two limbs included in the lower limb count.

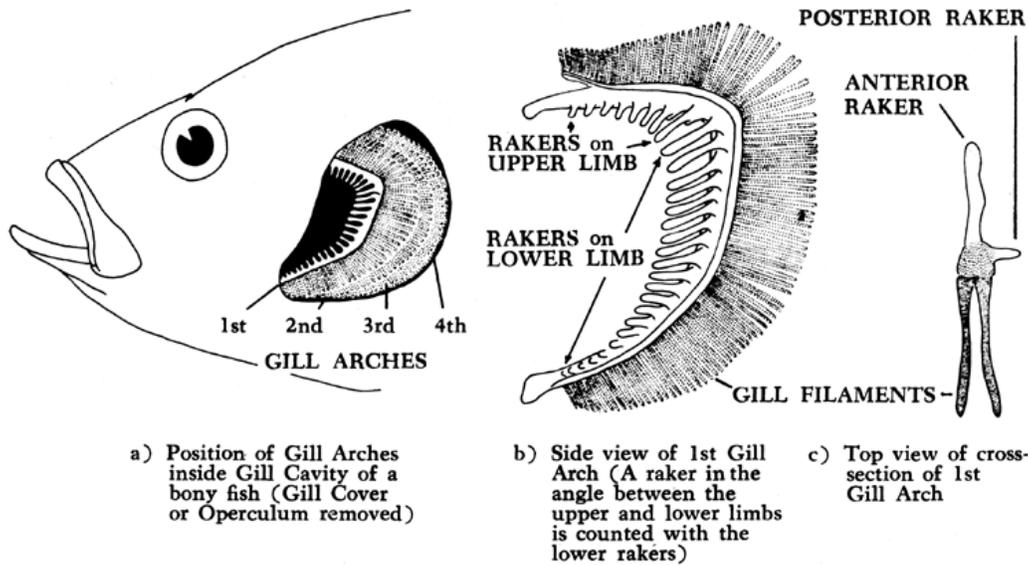


Image from: Miller, D. J. and Lea, R. N. Guide to the coastal marine fishes of California, 1972

Northern rock sole: Gill rakers slender and pointed. Typically ≥ 10 gill rakers on first arch, with ≥ 3 on the upper limb.

Southern rock sole: Gill rakers broad and robust. Typically ≤ 10 gill rakers on first arch, with ≤ 3 on the upper limb.

Appendix C3.—An example of an on-deck sampling form where rock sole identification was verified by the cruise leader.

ON DECK SAMPLING FORM - SPECIES COMPOSITION							
Haul	3	Vessel	Resolution	Cruise	1401	Total Wt.	631
Date	6/10/2014	Location	Chiniak			Bag (tare) Wt.	171
Recorder's Name	Spalinger					Whole-hauled debris weight	129
Species Name	100% ✓	Measured Weights	Unmeasured Weights (DUMPERS)	Count of unmeasured:			
				weighed	unweighed		
Halibut	✓	56, 75, 68					
Longnose	♂ ♀	✓ 61, 49					
Bering	♂ ♀	✓ 34, 10 ✓ 36					
Tanner	♂ ♀	✓ 9.84, 9.6 ✓ 13.26	5.63, 0.82 6.95	169 212			
Arrowtooth		21.01					
Flathead		11.50	26.94, 17.23				
Pollock	⊕	36.94, 22.56	35.67	125			
NRS		28.75 (GR-28N/2S; 26.74/1.23)	24.26				
SRS		3.31 (GR-5S)					
Longnose	✓		5.02, 4.9, 6.03	3, 1			
Rex		0.48					
NRS			28.75 (GR-28N/2S; 26.74/1.23)				
SRS			3.31 (GR-5S)				
Microgadomus			0.05	1			
Crangonid			0.06	26			
Argis d.			0.12	28			
Hys			0.40	12			
Molpadia			2.13	14			

Species/Sex count: _____ 100% count: _____ *Halibut and Skate entries are lengths!!

Page _____ of _____

Initial here after data has been entered: ○

APPENDIX D. DATA FORMS

Appendix D1.–Specimen collection form and instructions.

Specimen collection form <i>R/V Resolution</i>		
Species (suspected):		
Date:		
Haul Number:		
General Location:		
Collector:		
Photo Taken?	yes	no
file name and location:		
Reason for collection:	<input type="checkbox"/>	Confirm ID
	<input type="checkbox"/>	Special Project
	<input type="checkbox"/>	Guide Inclusion
	other (specify) _____	

Species (suspected)	Name of organism(s) collected, or best guess if unknown.
Date	Month, day, and year.
Haul Number	Haul number where organism(s) was captured.
General Location	Name of bay, gully, or area where haul occurred.
Collector	Name of person collecting.
Photo Taken?	Circle “yes” or “no”. If “yes” record location of picture file.
Reason for collection	Check appropriate box, or complete the “other” line. If collecting for a special project, include project description.
