

Fishery Management Report No. 14-38

**History of the Winter Salmon Troll Fishery in
Southeast Alaska/Yakutat**

by

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and

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October 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	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 (simple)	r
		corporate suffixes:		covariance	cov
Weights and measures (English)		Company	Co.	degree (angular)	$^\circ$
cubic feet per second	ft ³ /s	Corporation	Corp.	degrees of freedom	df
foot	ft	Incorporated	Inc.	expected value	E
gallon	gal	Limited	Ltd.	greater than	>
inch	in	District of Columbia	D.C.	greater than or equal to	\geq
mile	mi	et alii (and others)	et al.	harvest per unit effort	HPUE
nautical mile	nmi	et cetera (and so forth)	etc.	less than	<
ounce	oz	exempli gratia	e.g.	less than or equal to	\leq
pound	lb	(for example)		logarithm (natural)	ln
quart	qt	Federal Information Code	FIC	logarithm (base 10)	log
yard	yd	id est (that is)	i.e.	logarithm (specify base)	log ₂ , etc.
		latitude or longitude	lat or long	minute (angular)	'
Time and temperature		monetary symbols (U.S.)	\$, ¢	not significant	NS
day	d	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	H_0
degrees Celsius	°C	registered trademark	®	percent	%
degrees Fahrenheit	°F	trademark	™	probability	P
degrees kelvin	K	United States (adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	α
hour	h	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	β
minute	min	U.S.C.	United States Code	second (angular)	"
second	s	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard deviation	SD
Physics and chemistry				standard error	SE
all atomic symbols				variance	
alternating current	AC			population sample	Var
ampere	A			sample	var
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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**HISTORY OF THE WINTER SALMON TROLL FISHERY IN
SOUTHEAST ALASKA**

By

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ABSTRACT

The winter Chinook salmon troll fishery in Southeast Alaska is managed in accordance with the Alaska Board of Fisheries (BOF) Winter Troll Management Plan and the Pacific Salmon Treaty (PST). The winter troll fishery targeting Chinook salmon has been confined to inside waters of Southeast Alaska/Yakutat since 1950 and to waters inside the winter boundary line since the line was defined in 1969. A distinct winter season was established in 1981 (October 1 through April 14), and the winter fishery was designated as the beginning of the Chinook accounting year. A guideline harvest level (GHL) was established in 1994 and went into effect in 1995, which limited the winter troll harvest to 45,000 fish and a range of 43,000 to 47,000 fish. The fishery was managed inseason and closed early six times during the past 20 years. The winter boundary line has been modified over the years, as have winter season dates and the GHL.

Key words: Troll, winter, Southeast Alaska, Chinook, salmon, Commercial Fisheries, Alaska Department of Fish and Game, FMR, Fishery Management Report.

INTRODUCTION

This report describes the history of the Southeast Alaska winter troll fishery, conducted in waters defined by regulation 5 AAC 29.020(b). Winter troll seasons will be referred to by the year in which the fishery ended in this document. Fishing area descriptions, maps of open and closed waters, season dates, harvest guidelines, and management actions taken by the Alaska Department of Fish and Game (ADF&G) are included. Harvest, effort and Alaska hatchery contributions are presented and discussed. The winter troll fishery targets Chinook salmon, although pink, chum and sockeye salmon can also be taken incidentally. The fishery has been managed according to regulations adopted by the Alaska Board of Fisheries (BOF) since a distinct winter troll season was established in 1981. Trolling did occur during the winter prior to 1981 but with few restrictions.

Information for this report was drawn from various sources and is intended to provide a convenient summary for reference. A chronological listing of regulatory changes to the fishery is included, as are maps illustrating changes to the winter boundary line.

REGULATORY CHANGES

The commercial winter troll Chinook salmon fishery occurs in waters of Southeast Alaska and Yakutat Bay. Since 1950, the fishery has been confined to waters inside the “surflines” or winter boundary line, which runs south along the coast from Yakutat Bay to the U.S/Canada International Boundary. The surflines have been modified over the years (Figures 1–6).

1905: Commercial salmon trolling began near Ketchikan.

1906: U.S. Congressional Act provided for a 36-hour-per-week closure in all waters of Alaska.

1950: Prior to 1950, the commercial troll fishery was unlimited by area restrictions and the fishery continued year-round. The first major area closures were instituted in 1950, with the closure of “outside waters” from October 31 through March 15.

1973: Yakutat Bay opened to trolling in winter for the first time. All other waters of the Yakutat area closed to trolling from November 1 through April 14. Prior to 1978, the winter troll fishery was limited to waters south of Cape Spencer and east of the surflines from November 1 through April 14.

- 1978: The winter troll surpline was modified to go from Cape Ommaney to the Hazy Islands to Cape Addington, which opened waters west of Coronation Island. This increased the area open to winter trolling in Districts 4, 5 and 9.
- 1981: A separate winter season was established for the winter troll fishery as October 1–April 14. In prior years, trolling had been open year-round in a portion of the region. The Chinook accounting year was to begin on October 1 so that the winter fishery could proceed without the need for inseason management. The surpline was modified to open portions of District 16 between Cape Fairweather and Cape Spencer.
- 1991: The winter boundary line in Sitka Sound was modified to follow Loran lines between Cape Edgecumbe and Point Woodhouse, which enlarged the area open to trolling in Sitka Sound beginning in October of that year. The permit-only fishery in 11-A closed.
- 1992: The start of the winter troll fishery was delayed until October 11 to provide additional fish for summer salmon troll season. The Chinook Salmon Troll Task Force formed a plan for the troll fishery to accomplish the objectives set out by the BOF, which included changes intended to reduce the winter fishery harvest in order to reduce the number of summer season chinook non-retention days and the resultant incidental catch and release mortalities.
- 1994: The BOF adopted several new winter troll fishery regulations, which went into effect for the 1995 winter season:
- 1) The winter troll line in Sitka Sound was modified again to what it was prior to 1992; it now went from Cape Edgecumbe to Point Woodhouse (Biorka Island). This reduced the area open to trolling in Sitka Sound.
 - 2) All waters of District 116 north of Cape Spencer were closed to troll gear in winter.
 - 3) In Districts 4, 5, and 9, waters west of a line from Cape Ommaney to Nation Point and Helm Point to Cape Addington were closed. This modification reduced the area open to troll gear, although it left more area open than during years prior to 1978.
 - 4) The winter fishery would be managed so that the catch would not exceed the GHL of 45,000 Chinook salmon, with a guideline harvest range of 43,000–47,000 fish.

These measures were intended to help ensure a summer troll Chinook season of at least 10 days (preferably 20 days) and to reduce incidental mortality. The average winter troll catch had increased to 63,600 during the 1992–1994 winter seasons, compared to an average of 37,000 from 1986–1991. The new regulations were intended to reduce the troll Chinook salmon harvest by closing some of the most productive areas and establishing a harvest limit.

- 2003: The BOF adopted the following regulation changes:
- 1) The closing date for the winter troll fishery was modified, allowing the fishery to remain open through April 30 or until the GHL of 45,000 Chinook salmon had been harvested, with a guideline harvest range of 43,000–47,000 Chinook.
 - 2) The winter troll boundary line was modified in Yakutat Bay as follows: a line across Yakutat Bay from the westernmost tip of Point Manby at lat 59°41.66'N, long 140°19.70'W; to lat 59°40.02'N, long 140°24.36'W; to lat 59°31.25'N, long

139°53.69'W to Ocean Cape at lat 59°32.06'N, long 139°51.46'W. This modification expanded the area open to troll gear during the winter.

- 3) In section 11-A, the waters west of a line from Outer Point to Point Louisa and south and east of a line from Salisbury Point to Point Tantallon were to be open through April 14. The waters of Gastineau Channel were closed.
- 4) ADF&G was to add coordinates to the winter boundary line description where possible.

2006: The BOF adopted a regulation that allowed hand trollers to use two downriggers in conjunction with two fishing rods during the winter fishery only.

2012: The BOF adopted a regulation stating that the fishery was to be managed to not exceed the GHL of 45,000 non-Alaska hatchery-produced Chinook salmon, with a guideline harvest range of 43,000–47,000 non-Alaska hatchery-produced Chinook salmon, plus the number of Alaska hatchery-produced Chinook salmon. This regulation first went into effect during the 2014 season.

MANAGEMENT OBJECTIVES AND METHODS

The winter troll fishery harvest is constrained by regulatory limits as well as factors such as challenging weather conditions and short day length, which are typical throughout most of the winter season. Since the guideline harvest limit (GHL) went into effect in 1995, inseason management has been unnecessary during 14 of the past 20 years.

During years in which the GHL is approached, the fishery must be managed inseason and may need to close early, prior to April 30. Methods used for inseason management are similar to those used during summer troll Chinook salmon retention periods. Fish processors are requested to submit daily tallies to ADF&G listing the number of Chinook salmon purchased and the number of troll vessels unloaded that day. ADF&G port samplers stationed in several towns across the region interview trollers at the time fish are offloaded and sold to shore-based processors. Port samplers count fish, collect biological samples and record the location and dates fished. Troll fishery managers obtain information on catch rates, places fished, and effort from port samples and from fish tickets. Fishery performance data interviews are not conducted by port samplers during the winter fishery, and aerial surveys are not flown as they are during the summer troll fishery (July through September). The GHL was reached prior to April 30 during the 2003–2007 winter troll seasons, as well as during the 2011 and 2012 seasons. Prior to 2003, the GHL had not been exceeded since it went into effect in 1995.

The winter fishery was managed inseason and closed early (prior to April 30) during the following years:

2003: The winter troll Chinook harvest exceeded the GHL of 45,000 for the first time since it was established. Although the winter season was extended by regulation through April 30, the fishery closed on April 12, earlier than the previous closure date (April 14), because the harvest cap had been reached. The final harvest was 50,842 fish by 360 permit holders.

2004: The fishery closed on April 20. A total of 52,886 Chinook salmon were harvested by 439 permit holders.

- 2005: The fishery closed on April 9, which was the earliest closure date since the winter troll season was established in 1981. A total of 50,420 Chinook salmon were harvested by 441 permit holders.
- 2006: The fishery closed on April 21. A total of 469 permits harvested 48,919 Chinook salmon.
- 2011: The fishery closed on April 20. A total of 464 permits harvested 50,826 Chinook salmon.
- 2012: The fishery closed on April 27. A total of 507 permits harvested 47,902 Chinook salmon.

WINTER FISHERY HARVEST AND EFFORT

Since 1985, winter troll Chinook salmon harvests have ranged from 9,401 in 1996 to 71,831 in 1992. Annual harvests averaged 38,553 from 2009 through 2013 and 41,374 from 2004 through 2013. A total of 56,538 Chinook salmon were harvested during the 2014 winter fishery.

Effort ranged from a low of 230 permits in 1996 to a peak of 737 permits in 1989. The average number of permits fished from 2009 through 2013 was 450, similar to an average of 457 from 2004 through 2013. A total of 464 permits fished during the 2014 winter fishery.

The percentage of the annual troll Chinook harvest taken during the winter fishery ranged from 7% in 1996 to 39% in 1992. An average of 20% of the annual harvest was taken in winter from 2009 through 2013, compared to an average of 18% from 2004 through 2013. A total of 16% of the annual troll harvest was taken during the 2014 winter fishery.

The Alaska hatchery contribution to the winter fishery ranged from 4% in 1994 to 24% in 1991. The average contribution was 12% from 2009 through 2013 and 11% from 2004 through 2013. The Alaska hatchery contribution to the 2014 winter fishery was below average, at 6%.

The winter fishery can be divided into two sections: early winter (October–December) and late winter (January–April). Harvest, effort, and catch rates are typically higher during late winter (Table 1), with a large portion of the harvest occurring during the first and last months of the fishery.

The 2014 winter troll fishery began October 11, 2013, and continued through April 30, 2014. This was the first time that the Alaska hatchery contribution could be added to the GHF, due to a regulation adopted by the BOF in 2012. Of the 56,538 Chinook salmon harvested, 3,423 (6%) were of Alaska hatchery origin. This was the highest total winter fishery harvest since 1993. The Alaska hatchery contribution was below the 2004–2013 average of 11%.

Table 1.—Southeast Alaska winter troll fishery Chinook salmon harvest, permits fished, vessel landings, catch per landing, and Alaska hatchery percent of harvest by troll accounting year (October 1–September 30), 1985–2014.

Year	Early Winter (October–December)				Late Winter (January–April)				Total Winter (October–April)				Annual Total	Winter % of Annual Total	Alaska Hatchery % of Catch
	Chinook	Permits	Landings	Catch/Landing	Chinook	Permits	Landings	Catch/Landing	Chinook	Permits	Landings	Catch/Landing			
1985	14,235	371	869	16	8,590	316	1,148	7	22,825	499	2,017	11	215,811	11%	6%
1986	16,779	353	1,049	16	6,147	257	832	7	22,926	492	1,881	12	237,703	10%	6%
1987	18,453	365	1,235	15	10,075	290	996	10	28,528	514	2,231	13	242,562	12%	10%
1988	44,765	605	2,404	19	15,684	411	1,785	9	60,449	728	4,189	14	231,364	26%	14%
1989	24,425	630	2,239	11	9,872	337	1,403	7	34,297	737	3,642	9	235,716	15%	14%
1990	17,617	314	868	20	15,513	319	1,477	11	33,130	523	2,345	14	287,939	12%	13%
1991	19,920	310	787	25	22,719	405	2,037	11	42,639	565	2,824	15	264,106	16%	24%
1992	28,277	403	1,653	17	43,554	440	2,679	16	71,831	617	4,332	17	183,759	39%	10%
1993	20,275	310	1,194	17	42,447	418	2,366	18	62,722	493	3,560	18	226,866	28%	6%
1994	35,193	264	1,106	32	21,175	303	1,499	14	56,368	383	2,605	22	186,331	30%	4%
1995	10,382	186	627	17	7,486	223	871	9	17,868	298	1,498	12	138,117	13%	12%
1996	6,008	144	427	14	3,393	159	447	8	9,401	230	874	11	141,452	7%	18%
1997	13,252	162	626	21	7,705	185	514	15	20,957	256	1,151	18	246,409	9%	8%
1998	9,810	152	534	18	23,008	247	1,372	17	32,818	306	2,001	16	192,066	17%	7%
1999	13,989	150	579	24	16,988	253	1,435	12	30,977	286	2,026	15	146,219	21%	7%
2000	17,494	172	783	22	18,561	262	1,508	12	36,055	311	2,291	16	158,717	23%	9%
2001	11,198	198	907	12	11,388	259	1,382	8	22,586	322	2,298	10	153,280	15%	12%
2002	17,152	168	754	23	12,237	248	1,351	9	29,389	300	2,116	14	325,308	9%	7%
2003	18,672	193	725	26	32,182	313	2,365	14	50,854	360	3,090	16	330,692	15%	9%
2004	12,686	267	982	13	40,200	378	2,595	15	52,886	439	3,577	15	354,658	15%	12%
2005	12,991	275	1,103	12	37,479	375	2,955	13	50,470	444	4,058	12	338,446	15%	11%
2006	13,952	293	1,418	10	34,970	416	3,102	11	48,922	469	4,520	11	282,315	17%	8%
2007	7,642	297	1,092	7	39,230	420	2,808	14	46,872	503	3,900	12	268,149	17%	10%
2008	5,169	247	950	5	16,655	409	2,347	7	21,824	467	3,297	7	151,926	14%	13%
2009	5,511	197	770	7	19,378	379	1,983	10	24,889	380	2,753	9	175,644	14%	11%
2010	8,715	221	1,061	8	33,821	416	2,677	13	42,536	459	3,738	11	195,492	22%	13%
2011	12,867	257	1,339	10	37,959	393	2,437	16	50,826	464	3,776	13	242,123	21%	7%
2012	10,683	315	1,246	9	37,217	408	2,670	14	47,900	507	3,916	12	209,366	23%	13%
2013	8,188	248	1,070	8	18,424	376	2,255	8	26,612	442	3,325	8	148,584	18%	15%
2014	14,271	271	1,320	11	42,267	388	2,603	16	56,538	464	3,923	14	353,958	16%	6%
2009–13 avg	9,193	248	1,097	8	29,360	394	2,404	12	38,553	450	3,502	11	194,242	20%	12%
2004–13 avg	9,840	262	1,103	9	31,533	397	2,583	12	41,374	457	3,686	11	236,670	18%	11%

Note: Data includes Annette Island troll harvests.

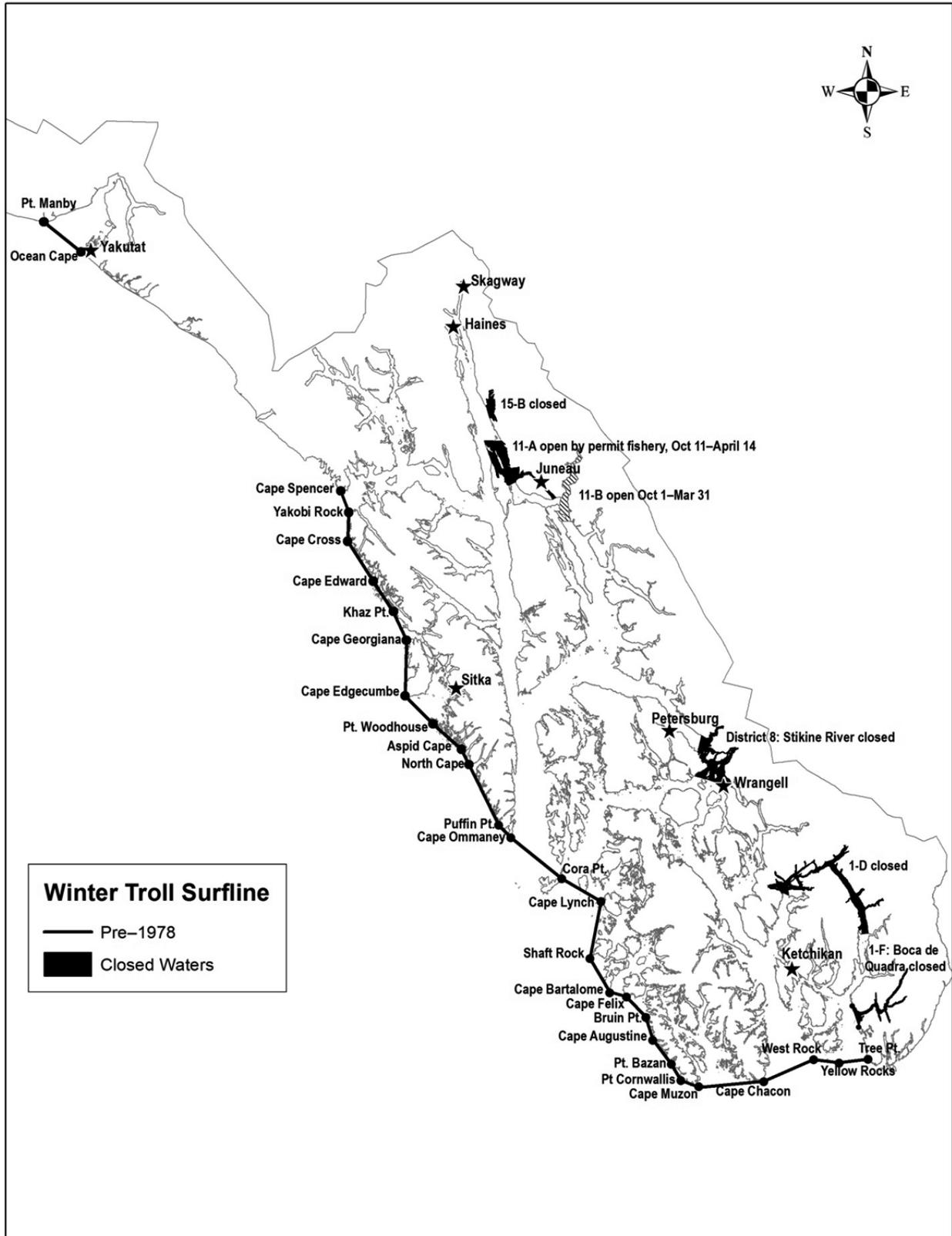


Figure 1.-Winter troll surfline prior to 1978.

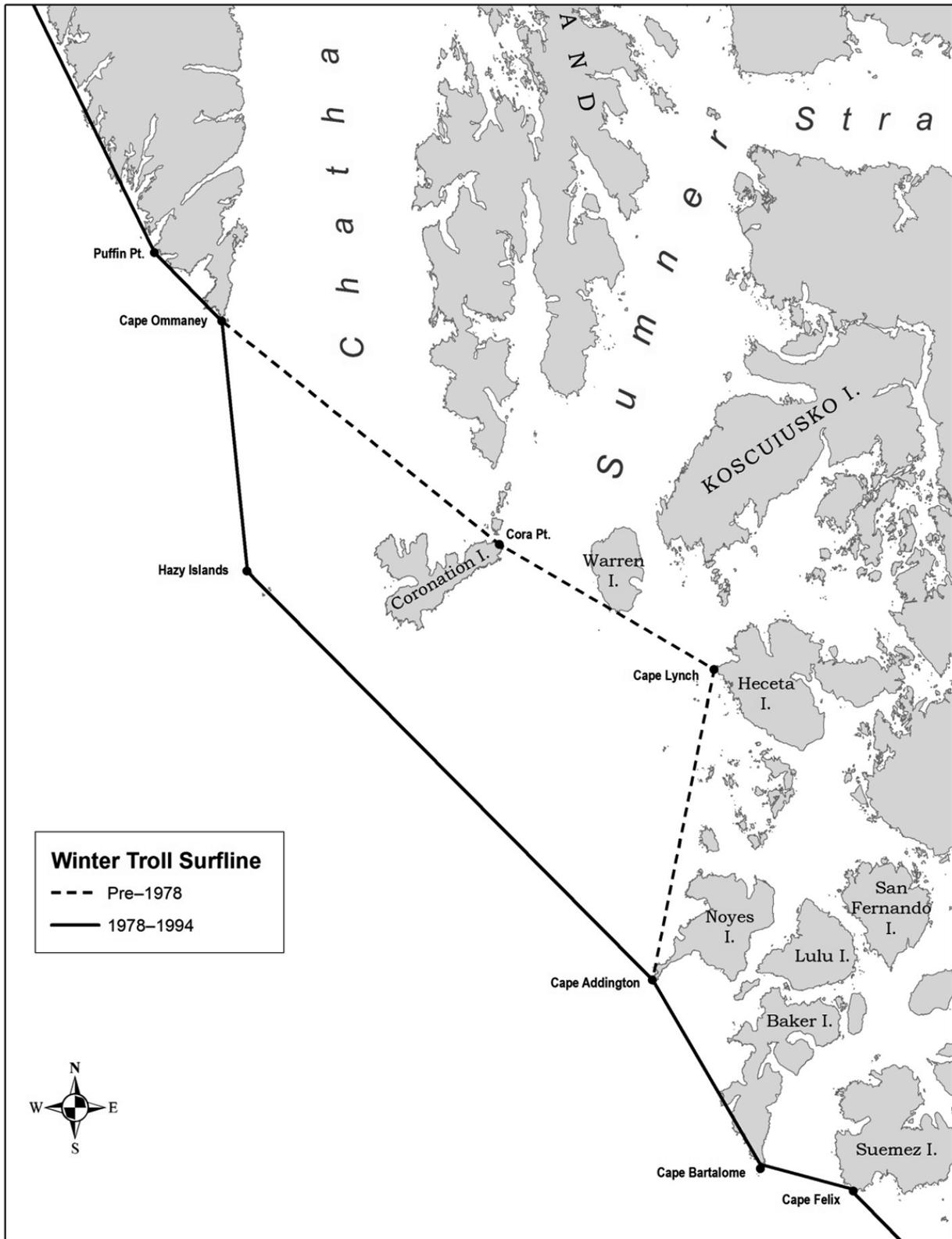


Figure 2.-Winter troll surfline modification, 1978-1994.

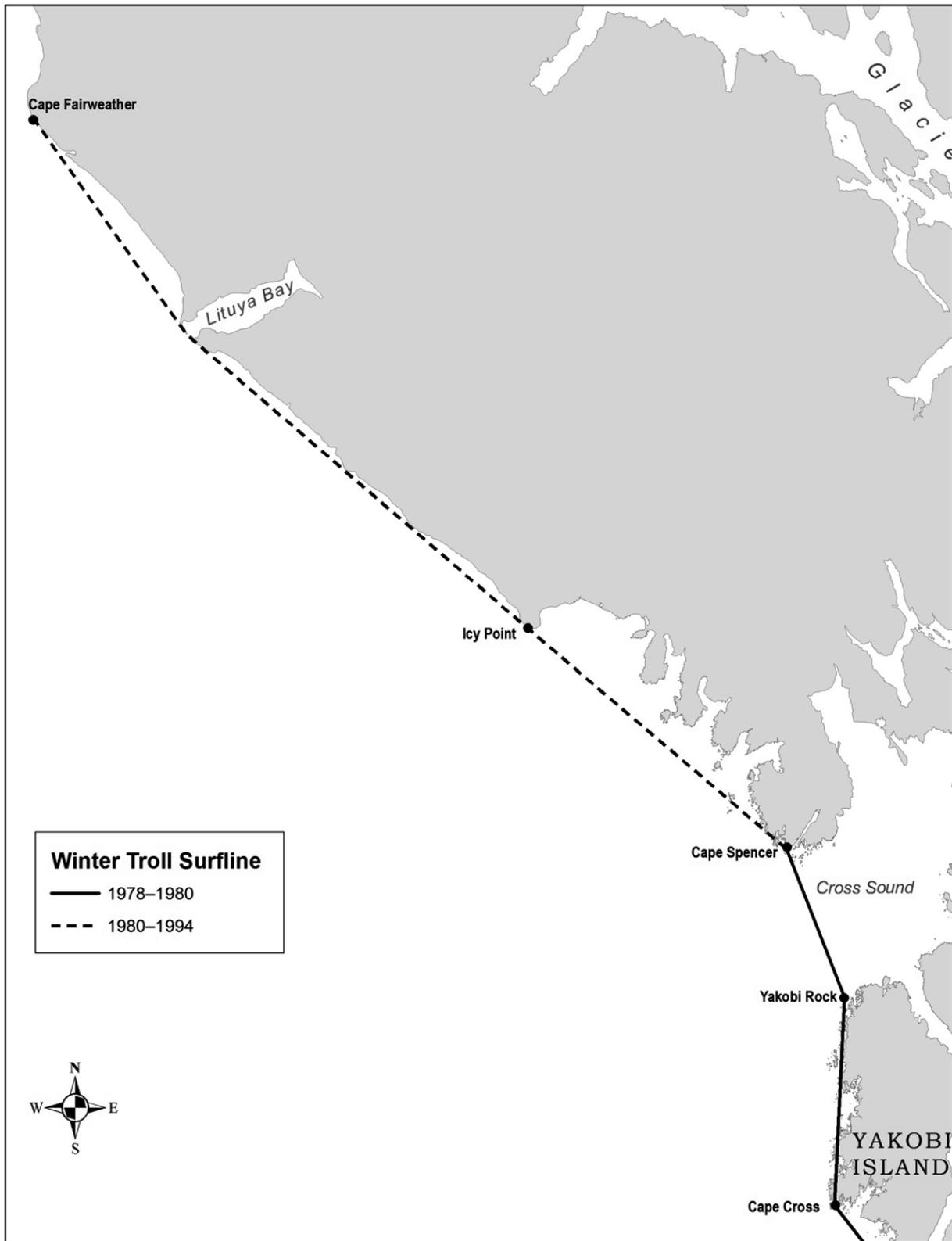


Figure 3.-Winter troll surfline modification, 1980-1994.

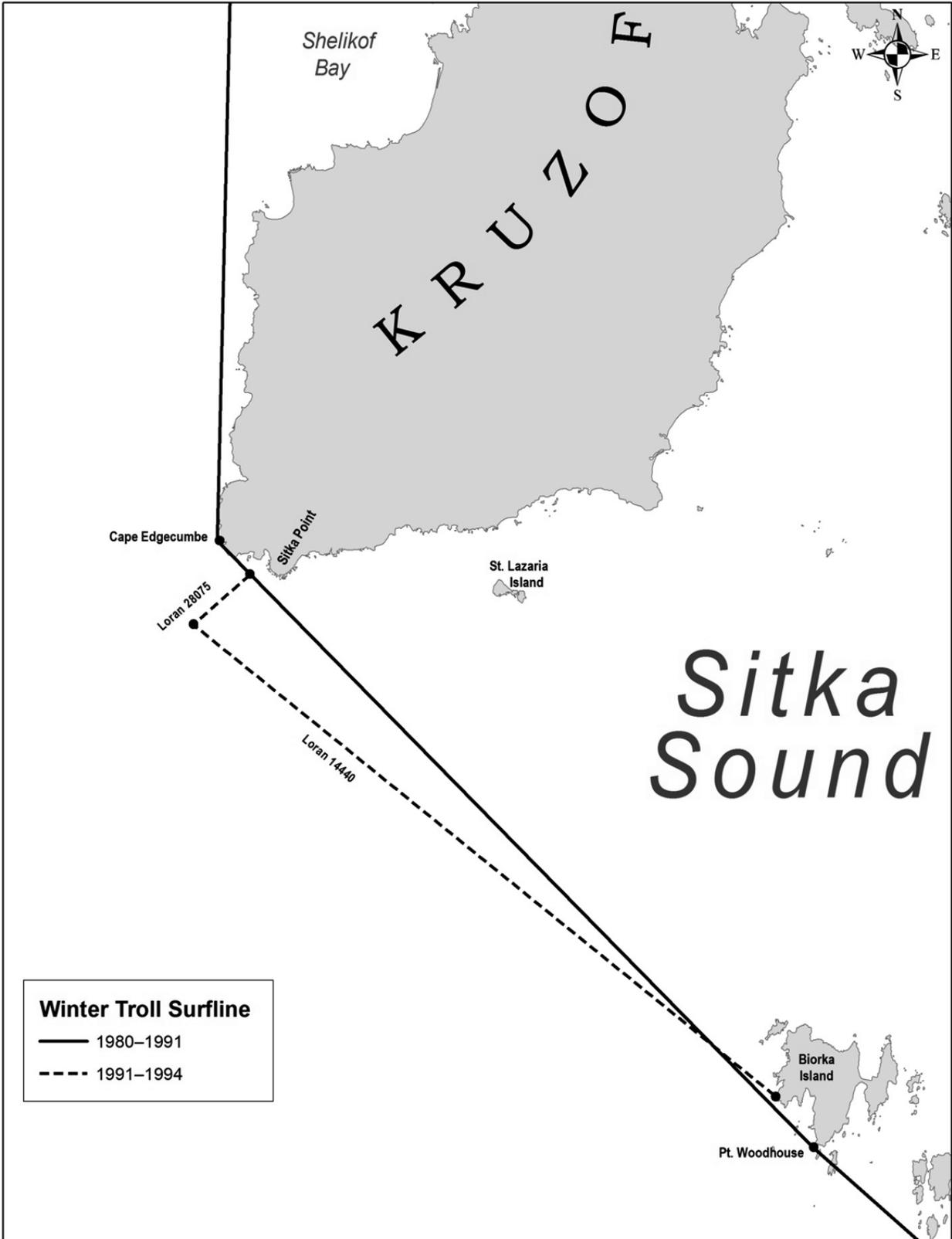


Figure 4.-Winter troll surfline modification, 1991-1994.

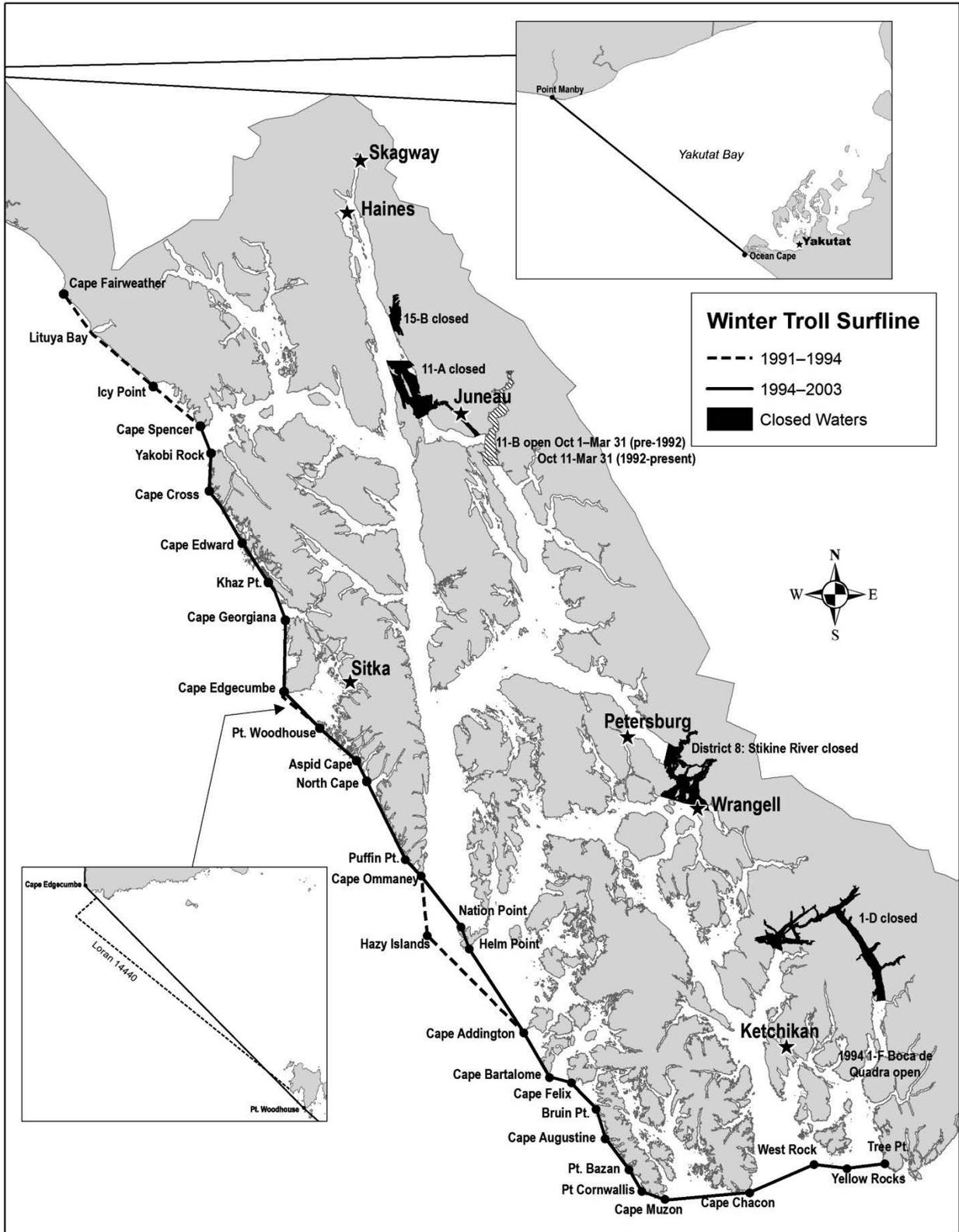


Figure 5.—Winter troll surfline, 1991–2003.

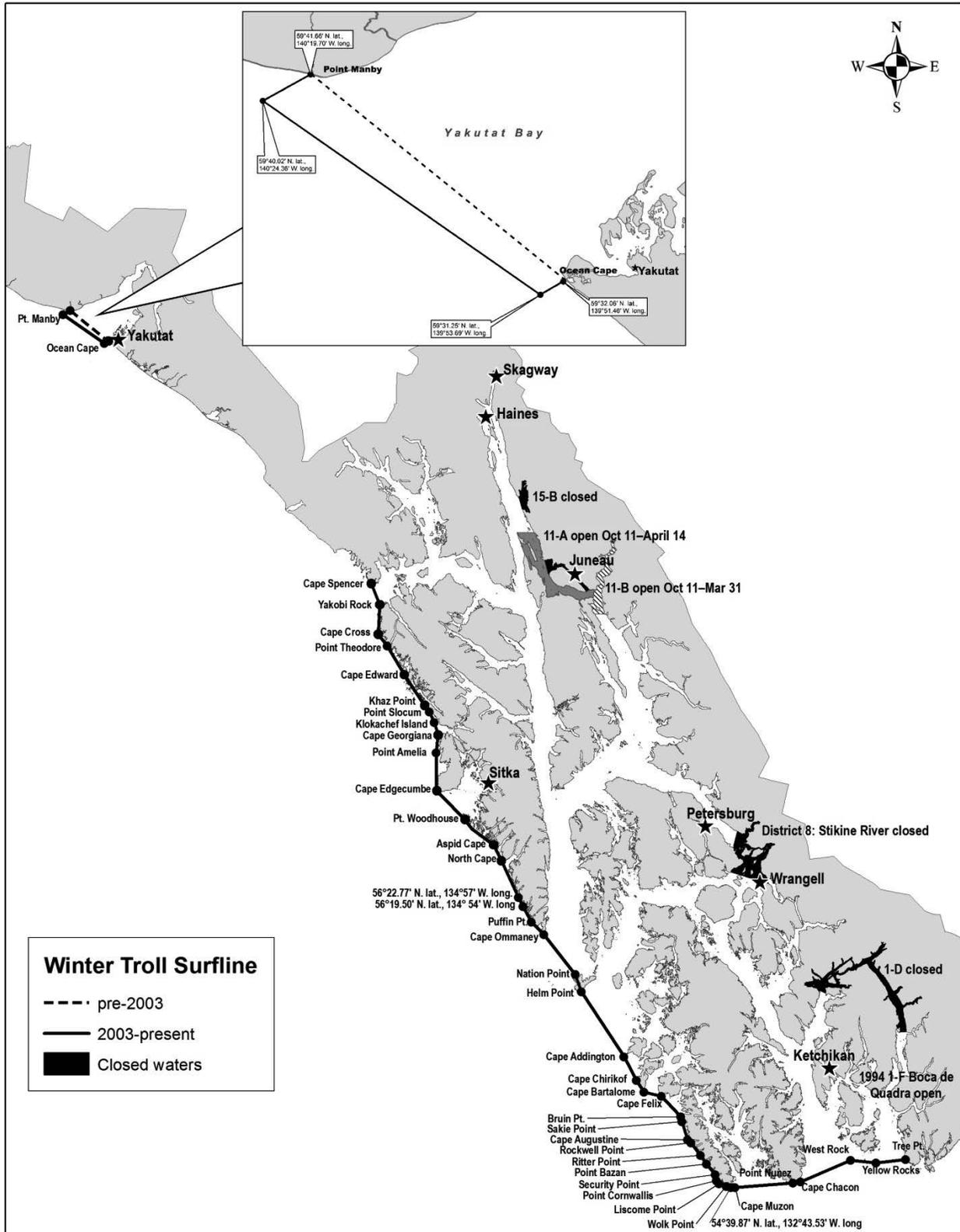


Figure 6.—Winter troll surfline, 2003 to present.