

Habitat (Alaska, Bering Sea)

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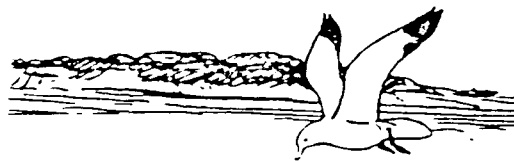
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A Quantitative Catalogue of Intertidal and Near Shore
Bird Habitats of Eastern Bering Sea

by

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1980

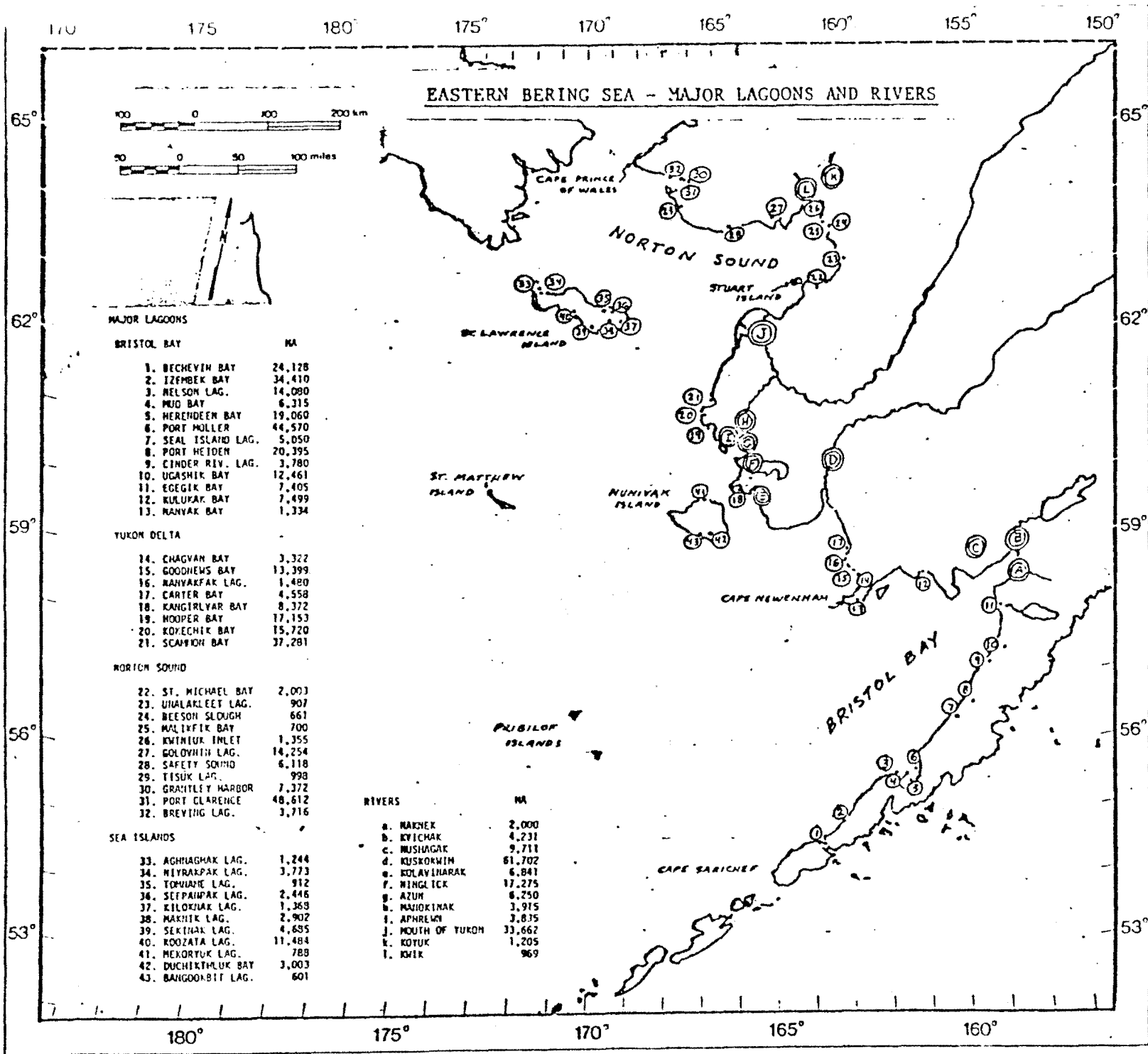


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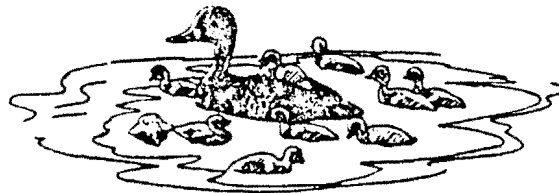
Introduction

Bering Sea waterbird habitats include four types; the shallow usually near shore waters where diving birds can feed on the bottom, the sheltered waters of lagoons and confined bays, unvegetated tidal mud flats and beaches, and vegetated flats to the upper limit of normal storm surges. Each of these extends for hundreds of thousands of acres within the Bering Sea area. Waterfowl and shorebirds respond to this wealth of habitats by utilizing them in great numbers. The region is important for nesting, migrational staging, and wintering birds. The entire population of many species depends on this habitat resource, in fact some species manage to survive year round within this region.

The waters of the eastern Bering Sea are thought to cover an oil bonanza. The prospect of floating oil within this bird mecca presents a management dilemma of world wide significance.

For these reasons it is advisable to have a better figure for the extent of these habitats than has previously been available. This report includes tables showing extent of intertidal habitats for 184 USGS maps that cover the eastern Bering Sea coastal zone and a summary table by four major regions.

No comparable data is available for any other sea coast, but if it were, it would be clear that this intertidal wealth is duplicated in few if any other parts of the world.



Methods

In order to develop a quantitative picture of the gross habitat features of the eastern Bering Sea that are exploited by waterfowl and shore-birds, we turned to existing maps of the area. An electronic digitizer (Numonics Corp. Model 1224) was used to measure shorelines and calculate the size of various areas. This data is presented in the attached tables.

For the area of salt water less than 10 fathoms, National Ocean Survey Navigation Chart 9302 of the eastern Bering Sea was used. All other observations were from U.S. Geological Survey maps. When available maps of the scale 1:63,360 (1 inch = 1 mile) were used. For the tip of the Alaska Peninsula, Unimak Island, Pribilof Islands, St. Matthew Island and St. Lawrence Island, these maps have not been issued so 1:250,000 (1 inch = 4 miles) were used. All U.S. Geological Survey maps are from photographs and were made in the period 1947 to 1963. Some changes have occurred along the coast since then, but not enough to significantly affect the figures as given.

The result of measuring maps is relative to the scale of the maps. We have found that measuring shorelines on 1:63,000 scale produces 20 to 30 per cent higher figures than when using 1:250,000 scale. The best figures could probably only be achieved by surveyors chaining off the land in the classic fashion. There is no question that surveyors would find our figures very conservative. Our figures are sufficient to indicate the vastness of the habitat available.

Other people calculating figures from these maps as we did or by using other equipment might get slightly different figures as decisions are necessary on each map regarding how and what to record. We submit that this is not important and the gross figures are valid and conservative.

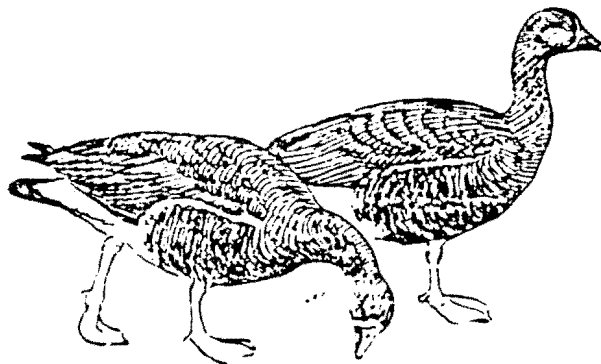


Table Columns

Area of salt water - This has been done on a rather large scale map (1 inch = about 24 miles), however, gross area figures are less affected by map scale than lineal measure of complex shorelines (Table 1 only).

Length of beach line - The map makers used the obvious vegetation line to delineate the shoreline. They show some intertidal lands below this line. Our measurement is an attempt to show the extent of salt water/land interface; thus, it includes the shoreline within lagoons and river mouths. Surveyors actually measuring each slough or creek mouth would get a much larger figure.

Area of lagoons and large river mouths - We measured 97 lagoons and 27 river mouths, some of which appear on portions of up to 3 maps. Many tiny lagoons and estuaries don't show on the maps, although bird use occurs there. Lagoons are protected from the open sea by barrier beaches or points; all lagoons are estuaries, though some have a great deal more fresh water infusion than others. Area of the rivers is shown on the maps with two banks that can be measured. We attempted to scale the area subject to salt water intrusion during high tidal surges. A major portion of such areas are the multiple mouths of the Yukon River known locally as Passes.

Unvegetated intertidal - These areas are shown as mud flats on the maps. The extent of mud flats shown depends on the level of the tide at the time the photos were taken. In many areas the authors have personal knowledge that exposure of mud is more extensive than shown on the maps. Our figures include such areas. The term unvegetated intertidal is handy, but not entirely correct. Various non vascular plants can be found in these areas as well as extensive growths of eel grass (*Zostera* sp.) in some areas.

Vegetated intertidal - This area is essentially the terrain between the outer edge of vascular plant growth (not including *Zostera*) and the line of driftwood cast up by high tides. It is normally a wet sedge/grass meadow. Maps do not show the driftwood line, but they do show elevations below 25 feet and in many places the 25 foot contour. Years of on the ground experience by the authors enabled us to draw in the approximate drift line.

Number of rivers - This refers to streams shown by two lines and/or named as rivers on the map. There is a difficulty on the Yukon Delta maps distinguishing between rivers and tidal sloughs so judgement was used there.

Number of streams - These show on maps as single blue lines. We did not try to distinguish between bona fide streams and tidal drainage gutters, but included what shows on the maps.

Table 1. Bering Sea Habitats for Waterfowl and Shorebirds
 (English measure in lineal or square miles)
 (Metric measure in kilometers or hectares)

Region and Number of Maps Scaled	Unit of measure	Area of salt water less than 10 fathoms (18.29 meters)	Length of beach line	Number of lagoons	Area of Lagoons	Number of large Tidal River mouths	Area of river mouths	Area of Unvegetated Intertidal	Area of Vegetated Intertidal	Number of rivers	Number of Streams
Bristol Bay Serichef to Newenham 61 maps	Eng. Met.	7,293 1,889,689	2,022 3,262	31	797 206,381	3	61 15,943	708 183,450	325 84,211	56	749
Yukon Delta Newenham to Stuart I. 68 maps	Eng. Met.	18,010 4,666,571	2,538 4,094	13	398 103,066	22	548 141,873	1,201 311,191	3,571 925,282	171	2,097
Norton Sound Stuart I. to Wales 39 maps	Eng. Met.	9,326 2,416,460	1,006 1,623	16	340 88,105	2	8 2,174	106 27,466	171 44,308	49	386
Sea Islands St. Lawrence Nunivak St. Matthew Pribilof 16 maps	Eng. Met.	2,946 763,338	1,179 1,902	37	145 37,579			48 12,437	37 9,587	40	399
TOTAL 184 maps	Eng. Met.	37,575 9,736,058	6,745 10,881	97	1,680 435,131	27	617 159,990	2,063 534,544	4,104 1,063,388	316	3,631

BRISTOL BAY - Serichef to Newenham

Number of Maps	Beach Mile	Number of Lagoons		Unvegetated Intertidal sq.mi.	Vegetated Intertidal sq.mi.	Number of Streams	Number of Rivers
			sq.mi.				
Hagemeister I. 11	284.39	5	7.74	12.99	16.88	145	5
Goodnews 1	19.20	0	0	.38	13.05	9	2
Nushagak 10	268.70	7	42.13	114.18	114.11	123	11
Dillingham 3	89.97	1	31.08	16.90	11.89	90	3
Naknek 10	235.40	3	52.63	224.97	33.78	102	17
Ugashik 5	131.67	1	48.09	29.66	100.70	49	4
Bristol Bay 2	102.59	2	19.61	22.16	3.10	16	1
Chignik 9	225.29	5	99.58	80.61	15.57	48	9
Port Moller 7	285.54	5	325.01	144.01	8.57	107	1
*Unimak 1	80.62	2	3.36	1.64	1.53	26	1
*False Pass 1	38.64	1	47.04	8.16	.77	3	
*Fort Randall 1	260.24	2	181.76	52.40	5.20	31	2
Subtotal 61	2,022.25	34	858.03	708.06	325.15	749	56

* 1:250,000 smallest scale maps available

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Hagemeister Island							
C-1	21.13	Unnamed	.05	.10	.01	16	
C-2	11.50			.10	.01	11	
C-3	24.35			.49	2.70	7	
C-4	34.58			4.00	2.00	7	
C-5	25.30	Unnamed	.15	1.12	1.16	14	
C-6	41.60	Nanvak Bay	5.15	1.28	2.62	10	Slug
C-7	7.66						
D-1	42.17			1.69	1.20	37	Negukthlik
D-2	9.98			.19	.15	6	
D-3	38.16	Unnamed	.28	1.52	4.58	15	Quigmy Matogak
D-4	27.96	Osviak	2.11	2.50	2.45	22	Osviak
Subtotal	11 284.39	5	7.74	12.99	16.88	145	5

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Goodnews A-4	19.20			.38	13.05	9	Togiak Kurtluk
Subtotal	19.20			.38	13.05	9	2

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Nushagak Bay D-1	11.00	Nushagak R	6.40	5.12	.10	5	
D-2	36.97			20.99	7.12	54	Clark Slough Rolph Slough
D-3	56.20			24.50	72.00	5	Snake Igushik
D-5	28.00	Kulukak Bay Trativak Bay	14.30 .76	5.50	11.90	7	Kanik
D-6	36.57	Kulukak Bay Metervik Bay	14.64 2.44	5.50	2.01	12	Kulukak Unnamed-2
C-1	14.40			36.70	.28	6	Unnamed-1
C-3	27.73			8.14	2.31	13	
C-4,5	14.49			1.49	5.23	7	
B-3	21.44	Unnamed Unnamed	.61 .29	3.04	3.02	10	Unnamed-2
B-4	21.90	Unnamed	2.69	3.20	10.80	4	
Subtotal	10 268.70	7	42.13	114.18	114.11	123	11

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Dillingham A-3	38.50			5.20	5.82	23	Alagnak Unnamed-1
A-6	10.49	Nushagak R	7.52	3.50	.20	16	
A-7	40.98	Nushagak R	23.56	8.20	5.87	51	Wood
Subtotal 3	89.97	1	31.08	16.90	11.89	90	3

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name	
			sq. mi.					
Naknek A-4	23.82	Egegik Bay	7.18	2.37	12.19	8	Egegik	
A-5	50.40	Egegik Bay	21.40	18.64	9.35	9	King Salmon	
B-5	23.90			13.87	.47	8	Big Creek	
C-3	30.40	Naknek R	5.66	3.96	.16	17	Naknek Unnamed-3	
C-4	21.85	Naknek R	2.06	25.12	.21	16		
C-5	10.06			63.97	1.67	5		
C-6	13.79			32.80	-----	9		
D-3	19.63	Kvichak R	10.81	7.58	5.99	17	Kvichak Unnamed-3	
D-4	30.27	Kvichak R	5.52	37.74	3.63	5	Unnamed-5	
D-6	11.28			18.92	.11	8	Unnamed-1	
Subtotal	10	235.40	3	52.63	224.97	33.78	102	17

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Ugashik B-6	8.47			.67	.60	1	
B-5	34.41	Ugashik Bay	11.63	3.00	62.70	21	Ugashik King Salmon Dog Salmon
C-5	40.10	Ugashik Bay	29.22	16.04	28.94	10	Unnamed-1
C-6	32.29	Ugashik Bay	7.24	8.15	7.16	10	
D-5,6	22.40			1.80	1.30	7	
Subtotal	131.67	1	48.09	29.66	100.70	49	4

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Bristol Bay A-2	21.10			2.16	1.1	8	
B-1	81.49	Unnamed Cinder River	5.02 14.59	20.00	2.00	8	Cinder
Subtotal	2 102.59	2	19.61	22.16	3.10	16	1

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Chignik A-8	24.47	Franks	.71	1.20	.50	8	Bear Sandy
B-7	21.02	Unnamed	.09	.42	2.38	12	Unnamed-1
B-6	5.42			.10	.40	2	
C-6	14.83			.30	1.19	1	Ocean
C-5	46.10	Seal Island	12.86	8.10	4.22	3	Ilnik Unnamed-1
C-4	26.40	Seal Island	6.63	4.60	3.00	3	Unangashik
D-4	16.91	Port Heiden Unnamed	.63 .58	1.39	1.20	4	
D-3	64.16	Port Heiden	75.21	62.00	2.56	12	
D-2	5.98	Port Heiden	2.87	2.50	.12	3	Meshik Birthday C
Subtotal	9 225.29	5	99.58	80.61	15.57	48	9

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Port Moller D-1	23.82	Port Moller	15.57	7.59	.48	24	
D-2**	51.44	Port Moller	99.69	42.33	1.03	32	
C-2,3	17.80	Herendeen Bay	7.68	.36	.36	5	
D-3**	103.30	Herendeen Bay	65.88	55.25	4.50	27	
		Mud Bay	22.44				
		Port Moller	56.75				
		Nelson	16.43				
D-4	49.41	Mud Bay	1.93	37.27	1.41	9	
		Nelson	37.06				
D-5	21.11	Nelson	.85	.84	.42	1	Caribou
		Salt Water	.32				
D-6	18.66	Salt Water	.41	.37	.37	9	
**Calculations done from 4 mile to inch map							
Subtotal	7		325.01	144.01	8.57	107	1

14

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Unimak	80.62	Christianson Peterson	2.56 .80	1.64	1.53	26	Pogromni
False Pass	38.64	Bechevin Bay	47.04	8.16	.77	3	
Fort Randall	260.24	Bechevin Bay Izembek Bay Swanson	46.08 132.80 2.88	52.40	5.20	31	Cathedral Unnamed-1
NOTE: CALCULATIONS DONE USING 4 MILE TO THE INCH MAP							
Subtotal	3 379.50	5	232.16	62.20	7.50	60	3

YUKON DELTA - Newenham to Stuart Island

Number of Maps	Beach Mile	Number of Lagoons		Unvegetated Intertidal sq.mi.	Vegetated Intertidal sq.mi.	Number of Streams	Number of Rivers
			sq.mi.				
Hagemcister I 4	65.85	2	13.09	12.39	6.77	46	2
Goodnews 5	145.66	6	72.47	44.82	125.14	118	16
Kuskokwim Bay 8	155.42	0	6.95	255.51	133.55	128	12
Baird Inlet 14	484.65	5	333.45	237.41	639.17	523	39
Nunivak 3	87.86	0	32.26	60.88	62.95	86	2
Marshal 2	145.66	3	32.93	11.14	166.21	145	15
Hooper Bay 12	597.96	9	281.45	182.71	709.83	594	33
Black 4	126.37	1	39.49	138.53	274.99	99	5
Kwiguk 7	417.00	7	103.99	86.49	900.48	147	18
Saint Michael 9	311.30	2	29.23	171.43	552.18	211	29
		Note: Lagoons are counted only the first time they appear.					
Subtotal 68	2,537.73	35	945.31	1,201.31	3,571.27	2,097	171

North of Cape Newenham

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Hagemeister Island C-6	21.2	unnamed	.27	.47	.20	11	
C-7	9.4					4	
D-5	3.79	Chagvan Bay	.63	.33	2.39	5	
D-6	31.47	Chagvan Bay	12.19	11.59	4.18	26	Kinegnak Salmon
Subtotal 4	65.85	2	13.09	12.39	6.77	46	2

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Goodnews A-7	16.43	Goodnews Bay	6.85	3.29	11.93	5	Tunulik Goodnews
A-8	58.89	Goodnews Bay Nanvakfak Carter Bay	44.86 5.71 1.08	6.03	2.50	53	
B-8	42.15	Carter Bay Unnamed Unnamed Jacksmith Bay	9.56 .65 .56 3.20	10.36	13.64	34	Carter C. Indian Cripple C. Jacksmith C. Unnamed - 3
C-8	21.65			18.22	13.51	23	Arolik Unnamed - 3
D-8	6.54			6.92	83.56	3	Kanektok Stoggnang C. Kanagtatlek C.
Subtotal	145.66	6	72.47	44.82	125.14	118	16

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name	
			sq. mi.					
Kuskokwim Bay A-1, B-1	19.92	Carter Bay	6.95	5.41	1.87	3	I	
D-1	18.5			43.46	28.02	22	Warehouse C. Tungak C. Unnamed -1	
D-2	13.46			20.59	10.80	17	Ishkowik Unnamed -1	
D-3	15.81			48.28	31.70	19	Kongnignanohk	
D-4	14.26			39.64	12.68	14	Kwigillingok	
D-5	14.42			43.33	17.76	19		
D-6	51.28			49.36	30.41	34	Aohwahk Kugulik Kinak Unnamed -1	
D-7	7.77			5.44	.31			
Subtotal	8	155.42	0	6.95	255.51	133.55	128	12

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Baird Inlet A-1	84.79	Kuskokwim R	72.46	38.22	102.03	78	Eenayarak Eek Apokek Kuskowak
A-2	24.71	Kuskokwim R	67.20	17.37	44.76	21	Tagayarak Unnamed-4
A-3	MISSING	LAP - NOT MUCH ON IT					
A-6	4.94			3.48	9.89	8	
A-7	28.54			64.46	47.00	34	Kinla
B-1	18.02	Kuskokwim R	20.26	3.00	31.74	28	
B-2	70.72	Kuskokwim R	47.37	12.75	60.30	75	Kialik Kinak Unnamed-7
B-7	32.89	KolavinarakR	8.26	4.33	42.04	26	Unnamed-4
B-8	33.12	KolavinarakR Kangirlvar B	2.04 .43	48.27	132.85	64	Kolavinarak Unnamed-1
C-1	36.89	Kuskokwim	30.84	8.78	54.00	47	
C-7	38.29	KolavinarakR Kangirlvar B	16.10 3.38	1.60	18.45	25	Unnamed-5 Tooksuk
C-8	10.92	Hazen Bay	2.20	5.00	14.22	11	Unnamed-2
D-7	13.95	Ninglick R	12.18	.50	3.28	7	Ninglick
D-8	86.87	Ninglick R	50.73	29.65	78.61	99	Unnamed-5
Subtotal							
14	484.65	5	333.45	237.41	639.17	523	39

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Nunivak B-1	23.43	Kangirlvar B	15.70	45.52	20.68	34	
C-1	37.18	Kangirlvar B	12.80	1.74	1.70	17	Alakuchak Tanunak
D-1	27.25	Ninglick R	3.76	13.62	40.57	35	
Subtotal	3	87.86	0	32.26	60.88	86	2

Map Name and Number	Beach Mile	Lagoon Name	sq. mi.		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
Marshal A-8	91.56	Azun R Anerkochik R Manokinak R	24.12 2.05 .85		8.98	131.60	101	Azun Anerkochik Manokinak Unnamed-11
B-8	54.10	Manokinak R	5.91		2.16	34.61	44	Unnamed-1
Subtotal	2 145.66	3	32.93		11.14	166.21	145	15

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name	
			sq. mi.					
Hooper Bay A-1	108.42	Aknerkochik R	2.61	23.26	106.93	148	Aphrewn Unnamed-7	
		Manokinak R	7.39					
		Aphrewn R	5.05					
A-2	40.37	Aphrewn R	.99	25.48	42.60	24	Opagarak Tutakoke Unnamed-2	
B-1	44.60	Aphrewn R	8.76	1.94	111.70	47	Kuyungsik Unnamed-2	
		Manokinak R	.96					
B-2	87.15	Kashunuk R	4.56	12.54	119.40	215	Kashunuk Unnamed-6	
		Keoklevik R	3.88					
B-3	43.40	Keoklevik R	.99					
		Hooper Bay	38.05	47.07	39.61	32	Keoklevik	
C-1	36.60	Kokechik R	3.95	.73	38.90	3	Unnamed-1	
C-2	51.60	Kokechik R	3.20	.60	93.30	32	Kokechik	
		Hooper Bay	28.15					
C-3	52.93	Kokechik Bay	49.10	36.46	46.58	27	Kolomax Lithkealik Ekasluktuli Unnamed-3	
C-4	27.54	Kokechik Bay	5.16	6.95	3.69	4		
D-1	11.08	Kun R	.69	.44	38.71	2	Unnamed-1	
		Kun R	2.29					
D-2	48.26	Scammon Bay	20.52	13.32	63.23	50	Unnamed-1	
D-3	46.01	Kokechik Bay	6.41	13.92	5.18	10		
		Scammon Bay	88.74					
Subtotal	12							
		597.96	9	281.45	182.71	709.83	594	33

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Black A-1					38.76		
A-2	42.38	Scammon Bay	34.62	72.30	65.13	24	Meiatolik C
B-1	66.03	Black R	4.87	47.67	160.70	63	Black R Unnamed-3
C-1	17.96			18.56	10.40	12	
Subtotal	4 126.37	1	39.49	138.53	274.99	99	5

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Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Kwiguk B-6	33.06	Kwemeluk Pass	13.63	1.36	119.69	13	Yukon
C-4	43.97	Kwikipak Pass Kwikluak P	7.12 1.70	2.00	25.90	6	Unnamed-3
C-5	47.70	Kwikluak P	27.60	4.57	1.55	11	
C-6	105.10	Kwemeluk P Kwikluak P	11.19 17.99	25.06	153.34	35	Unnamed-7
D-4	32.40	Apoon Pass	3.39	1.50	172.80	19	
D-5	71.60	Kwikipak Pass Kawanak Pass	4.76 9.05	2.50	257.00	8	
D-6	83.17	Kwiguk Pass Bugomowik P	5.96 1.60	49.50	170.20	55	Unnamed-7
Subtotal	7	7	103.99	86.49	900.48	147	18

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Saint Michael A-2	18.10			.72	1.86	28	Unnamed-2
A-3	49.40	Apoon Pass	.84	6.15	25.13	34	Unnamed-4
		Pastolik R	1.70				
A-4	81.58	Apoon Pass	4.72	66.00	182.70	40	Unnamed-6
		Okwega Pass	5.26				
A-5	64.40	Kwipak Pass	7.11	72.80	241.00	66	Unnamed-8
		Kawanak Pass	3.42				
A-6	45.20	Kwipak Pass	.54	23.55	31.53	19	Unnamed-4
		Kawanak Pass	5.64				
B-1	15.80			.94	58.50	14	Saint Michael Canal Kulak
B-2	8.65			.52	8.91	6	Kogok Pikmiktalik
C-1	11.54			.23	.23	3	
C-2	16.63			.52	2.32	1	Stuart Island Canal
Subtotal	9		2	29.23	171.43	211	29

NORTON SOUND - Stuart Island to Wales

Number of Maps	Beach Mile	Number of Lagoons		Unvegetated Intertidal sq.mi.	Vegetated Intertidal sq.mi.	Number of Streams	Number of Rivers
			sq.mi.				
Saint Michael 3	62.45	1	7.73	4.32	3.35	27	4
Unalakleet 5	109.77	1	3.50	5.44	5.44	82	2
Norton Bay 3	258.53	6	20.57	43.74	89.86	84	23
Solomon 9	283.58	4	80.39	31.19	38.73	83	8
Nome 6	107.50	3	5.83	2.39	7.07	42	6
Teller 8	184.34	3	230.40	19.06	26.96	68	6
Subtotal 39	1,006.17	18	348.42	106.14	171.41	386	49

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Saint Michael B-1	21.20	St. Michael	7.73	3.50	2.80	8	St. Michael Canal
C-1	26.25			.52	.25	19	Unnamed-3
C-2	15.00			.30	.30		
Subtotal	3 62.45	1	7.73	4.32	3.35	27	4

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Unalakleet B-5	14.50			.29	.29	31	
B-6	26.12			.52	.52	19	
C-4	12.20			.24	.24	13	
C-5	15.79			.32	.32	7	Golsovia
D-4	41.16	Unalakleet	3.50	4.07	4.07	12	Unalakleet
Subtotal	5	109.77	1	3.50	5.44	82	2

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Norton Bay A-4	22.43	Beeson Slough	1.02	1.00	1.36	9	Egavik
B-5	74.00	Beeson Slough Shakloolik B Malifik Bay	1.53 1.70 2.70	12.30	26.90	12	Shakloolik Sineak Unnamed-6
C-4	19.62			5.88	4.80	18	Ungalik
C-5	19.15			15.40	2.50	7	
C-6	25.21	Kwiniuk Inlet	5.23	.69	5.30	4	Tubutulik Unnamed-1
D-4	30.19	Koyuk R	2.22	.56	22.22	6	Inglutalik Aukulik
D-5	39.63	Koyuk R	2.43	2.37	19.78	17	Koyuk Unnamed-4
D-6	28.30	Kwik R	3.74	5.54	7.00	11	Kwik Unnamed-3
Subtotal	8 258.53	6	20.57	43.47	89.86	84	23

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Solomon B-2	31.38			.63	.63	15	
B-3	21.57			.43	.43	4	
B-6	45.65	Safety Sound	15.62	5.02	1.50	8	
C-1	32.20	Moses	1.36	2.34	3.50	8	Kwiniuk
C-2	10.05			.30	.20	3	
C-3	62.20	Golovnin	55.01	17.31	27.28	23	Kachavik Younglik Fish
C-4	17.15			.34	.34	8	
C-5	37.08	Taylor Safety Sound	.41 1.41	1.00	2.85	8	Solomon
C-6	26.30	Safety Sound	6.58	3.82	2.00	6	Bonanza Eldorado Flambeau
Subtotal	9 283.58	4	80.39	31.19	38.73	83	8

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Nome B-1	14.67			.29	.29	9	Nome
C-1	2.21			.04	.06	1	Snake
C-2	16.00			.32	.48	5	Cripple
C-3	21.44	Unnamed	.73	.42	.42	15	Sinuk
D-3	39.93	Fairview Tisuk	1.25 3.17	.80	3.60	10	Feather Tisuk
D-4	13.25	Tisuk	.68	.52	2.22	2	
Subtotal	6	3	5.83	2.39	7.07	42	6

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name	
			sq. mi.					
Teller A-3	14.52	Grantley Har.	4.17	.29	.51	9	Tuksuk Channel	
		Port Clarence	7.28					
A-4	58.41	Port Clarence	107.14	14.09	21.72	9		
B-3	28.99	Port Clarence	18.46	.87	.58	14		
		Grantley Har.	24.28					
B-4	45.50	Port Clarence	54.73	3.05	2.91	12	California Don	
		Brevig	14.34					
B-5	15.21			.30	.58	10	Lost King	
B-6	7.94			.16	.16	4	Kanauguk	
C-6	10.10			.20	.40	10		
C-7	3.67			.10	.10			
Subtotal	8	184.34	3	230.40	19.06	26.96	68	6

BERING SEA ISLANDS

Number of Maps	Beach Mile	Number of Lagoons		Unvegetated Intertidal sq.mi.	Vegetated Intertidal sq.mi.	Number of Streams	Number of Rivers
			sq.mi.				
*St. Lawrence 1	593.40	12	116.48	15.42	15.42	140	Unnamed-15
*St. Matthew 1	122.96	5	4.96	2.46	3.69	74	
*Pribilofs 1	72.40	1	.32	1.45	1.45	2	
Nunivak 8	219.78	12	6.45	12.08	5.17	106	Unnamed-16
Cape Mendenhall 5	170.44	7	16.82	16.91	11.60	77	Unnamed-9
* Calculations Done from 4 Mile to the Incl Map							
Subtotal 16	1,178.98	37	145.03	48.32	37.33	399	40

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Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
St. Lawrence	593.40	Troutman	1.12	15.42	15.42	140	Kangik
		Ahnaghak	4.80				Aghnuk
		Niyrakpak	14.56				Ikalooksik
		Mugum	1.76				Kookooliktook
		Kangee	1.12				Ynveeghik
		Ongoveyuk	1.28				Aivichtik
		Tomname	3.52				Fossil
		Seepanpak	9.44				Ongoveyuk
		Kiloknak	5.28				Tapisaghak
		Maknik	11.20				Maknek
		Sekinak	18.08				Seknak
		Koozata	44.32				Okok
			Moghweyik				
			Koozata				
(CALCULATIONS DONE USING 4 MILE TO			NCH MAPS)				
Subtotal	593.40	12	116.48	15.42	15.42	140	15

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
St. Matthews Island	122.96	Unnamed	.64	2.46	3.69	74	
		Unnamed	.32				
		Unnamed	.32				
		Unnamed	.32				
		Unnamed	3.36				
(CALCULATIONS DONE USING 4 MILE TO INCH MAPS)							
Subtotal	122.96	5	4.96	2.46	3.69	74	

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Pribilof Islands	72.40	Unnamed	.32	1.45	1.45	2	
(CALCULATIONS DONE USING 4 MILE TO THE INCH MAPS)							
Subtotal	72.40	1	.32	1.45	1.45	2	

Map Name and Number	Beach Mile	Lagoon Name		Unvegetated Intertidal sq. mi.	Vegetated Intertidal sq. mi.	Stream Number	River Name
			sq. mi.				
Nunivak Island A-2	32.75	Unnamed	.08	3.05		10	Kaliksneethnook
		Unnamed	.18				Unnamed-4
A-5	6.39			.26	.13	2	Unnamed-2
A-6	28.04	Nash Harbor	.13	.56	.84	16	Unnamed-1
A-7	28.25	Dooksook	.20	.56	.56	10	Dooksook
B-2	11.91			.48	.24	5	
B-3	27.09	Unnamed	.06	1.08		10	Unnamed-3
		Mekoryuk	3.04				
B-4	46.88	Unnamed	.36	4.36	1.44	31	Mekoryuk
		Unnamed	.90				
		Unnamed	.34				
		Unnamed					
B-5	38.47	Nariksiut	.38	1.73		22	Kahniruk
		Ahding	.45				Nariksiut
		Unnamed	.33				Ahding
Cape Mendenhall							
D-2	29.21	Bimiut	.27	1.17	.58	8	
D-3	43.47	Bimiut	.52	5.08		18	Unnamed-3
		Unnamed	1.39				
D-4	62.42	Duchikthluk	11.59	9.60		33	Duchikmiut
		Bangookbit	2.32				Binajoaksmiut
D-5	21.27	Chakwakamiut	.31	.64		13	Chakwakamiut
		Binajoaksmiut	.31				Unnamed-1
D-6	14.07	Unnamed	.11	.42	.42	5	Unnamed-2
Subtotal							
13	390.22	19	23.27	28.99	16.77	183	25

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Area of Major Lagoons and Rivers

MAJOR LAGOONS

Bristol Bay	Ha	Norton Sound	Ha
1. Bechevin Bay	24,128	22. St. Michael Bay	2,003
2. Izembek Bay	34,410	23. Unalakleet Lag.	907
3. Nelson Lagoon	14,080	24. Beeson Slough	661
4. Mud Bay	6,315	25. Malikfik Bay	700
5. Herendeen Bay	19,060	26. Kwiniuk Inlet	1,355
6. Port Moller	44,570	27. Golovnin Lagoon	14,254
7. Seal Island Lag.	5,050	28. Safety Sound	6,118
8. Port Heiden	20,395	29. Tisuk Lagoon	998
9. Cinder Riv. Lag.	3,780	30. Grantley Harbor	7,372
10. Ugashik Bay	12,461	31. Port Clarence	48,612
11. Egegik Bay	7,405	32. Brevig Lagoon	3,716
12. Kulukak Bay	7,499		
13. Nanvak Bay	1,334	Sea Islands	
		33. Aghnaghak Lag.	1,244
Yukon Delta		34. Niyrapak Lag.	3,773
14. Chagvan Bay	3,322	35. Tomname Lag.	912
15. Goodnews Bay	13,399	36. Seepanpak Lag.	2,446
16. Nanvakfak Lag.	1,480	37. Kiloknak Lag.	1,368
17. Carter Bay	4,558	38. Maknik Lag.	2,902
18. Kangirlvar Bay	8,372	39. Sekinak Lag.	4,685
19. Hooper Bay	17,153	40. Koozata Lag.	11,484
20. Kokechik Bay	15,720	41. Mekoryuk Lag.	788
21. Scammon Bay	37,281	42. Duchikthluk Bay	3,003
		43. Bangookbit Lag.	601

MAJOR RIVERS

a. Naknek	2,000
b. Kvichak	4,231
c. Nushigak	9,711
d. Kuskokwim	61,702
e. Kolavinarak	6,841
f. Ninglick	17,275
g. Azun	6,250
h. Manokinak	3,915
i. Aphrewn	3,835
j. Mouth of Yukon	33,662
k. Koyuk	1,205
l. Kwik	969

