1996 Report

Deer Pellet-Group Surveys in Southeast Alaska

by

Mark J. Kirchhoff

Alaska Department of Fish and Game
Division of Wildlife Conservation
Douglas, Alaska

1996

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MEMORANDUM **STATE OF ALASKA**
DEPARTMENT OF FISH AND GAME

TO: Distribution **DATE:** July 5, 1995

FROM: Mark Kirchhoff **PHONE NO:** 465-4329
Wildlife Biologist
Div. Wildlife Conservation **SUBJECT:** 1996 Deer Survey
Douglas Results (preliminary)

1996 DEER PELLET SURVEY RESULTS

VCU	NAME	PLOTS	1996	PREVIOUS YEAR SURVEYED	PREVIOUS MEAN (PG/PLOT)
35	North Douglas	323	0.97	1995	0.86
36	Pt. Hilda	240	1.68	1995	1.41
128	Hawk Inlet	325	1.26	1992	1.61
202	Port Frederick	226	1.01	1988	1.87
209	Suntaheen	277	0.97	1994	1.05
218	Pavlof	349	1.79	1992	1.56
223	Upper Tenakee	263	0.56	1994	0.61
231	Saltery	152	1.90	1994	0.97
235	Kadashan	204	2.35	1995	2.64
247	Finger River	221	2.62	1994	2.29
300	Nakwasina	210	2.82	1995	1.75
305	Sealion Cove	225	1.63	1995	1.30
361	Knight Is.	153	0.00	1994	0.44
368	Yakutat Islands	379	0.60	1994	0.66
417	Conclusion Is.	191	1.45	1991	0.71
448	Woewodski	243	2.25	1995	1.38
489	Muddy	348	1.53	New	
532	Red Bay	281	1.19	1994	0.94
549	Sarheen	334	0.99	1989	1.73
561	Warm Chuck	276	1.39	1991	2.05
748	George Inlet	305	1.02	1994	0.95
765	Dall Head	295	1.07	1981	0.52
767	Duke Is.	294	0.05	New	
769	Alava	324	0.93	1994	0.79
999	Gravina	338	1.44	1994	1.58

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INTRODUCTION

This report summarizes the deer pellet-group survey work conducted by the Alaska Department of Fish and Game and the United States Forest Service during 1996. Pellet-group data are used by biologists to monitor deer population trends in specific watersheds throughout the region. The data also permit general comparisons of deer numbers from area to area within the region. The reader is referred to Kirchhoff and Pitcher (1988) for a more detailed discussion of objectives, sample design, and field methodology of this program.

RESULTS

During 1996, 25 watersheds, (or value comparison units - VCUs), were surveyed. For each VCU, transect locations, physiographic information, deer population density, and trend are described. Overall, deer pellet-group densities were the same or a little higher in most areas of Southeast this year. Eight VCUs showed increases, five showed decreases, ten were about the same, and two were new. Complete results for each VCU are found in Table 1. A brief summary of deer population trend by game management unit follows:

Subunit 1A and Unit 2 - Southern Southeast Alaska. In 1996 five VCUs were surveyed in Subunit 1A and three VCUs were sampled in Unit 2. Deer densities in Subunit 1A appear to have remained stable during the past year, while densities in Unit 2 were mostly down. Declines of 30- 40% were observed in VCUs 549 and 561 (Sarheen and Warm Chuck). The lower numbers probably result from a combination of habitat alteration, wolf predation, and hunting pressure rather than winter loss.

Subunit 1B andUnit 3 - Central Southeast Alaska. In 1996 three VCUs were surveyed in Subunit 1B and Unit 3. Deer densities in Unit 3 were up, particularly on the SW portion of Mitkof Island. Deer pellet-group density here was the highest its ever been. On the other hand, deer density on Kuiu Island appears to remain low. Four crew members scoured the beach fringe for two hours at Port Beauclerc and found not a single pellet group, track, or evidence of browsing.

Three new transects were established by the Forest Service at Muddy River (VCU 489) in 1996. Deer pellet-group density was fairly high, confirming suspicions by FS biologists that deer populations have increased in this area since the late 1970s.

Unit 4 - Northern Southeast Alaska. In 1996 ten VCUs were surveyed in Unit 4. Deer densities in most of these VCUs were the same or higher than in previous years surveyed. The one bleak spot was at Port Frederick (VCU 202), where deer pellet density was down about 40%, probably due to the severe winter two years ago. In general though, Unit 4 remains the place in Southeast Alaska with the most deer.

Subunit 1C - Juneau and Mainland. Douglas Island is the most important area in Unit 1C for Juneau deer hunters and VCUs on the island are regularly surveyed to track the deer population trend. In 1996 both North Douglas (VCU 35) and Pt. Hilda (VCU 36) were surveyed and the results show that deer numbers are holding steady or slightly increasing on the island.

Unit 5 - Yakutat. Five deer pellet transects were run at Yakutat during May 1996. Survey results indicate that deer densities on the Yakutat Islands (Khantaak, Dolgoi, and Kriwoi islands - VCU 368) have remained low, averaging about 0.6 pellet groups per plot. Kriwoi Island had the highest deer pellet density of the three islands.

Survey results from Knight Island and Chicago Harbor (VCU 361) indicate that deer densities in the area have decreased from low levels in the early 1990s to no deer in 1996. Deer have probably been eliminated by a combination of hunting pressure and wolf predation. Based on pellet survey results from the early 1990s, ADF&G estimated the Yakutat deer population at approximately 300 animals. With the apparent complete loss of deer at Knight Island, the Yakutat deer population may be significantly lower now.

NARRATIVES

North Douglas (VCU 35) - Douglas Island is located immediately opposite the City of Juneau and is heavily used by local hunters. Three transects were established at the end of the road system in 1991. The transects rise to over 1,000 feet in elevation and traverse low to moderate volume hemlock stands. Deer pellet-group densities in 1996 remained low at less than one pellet group per plot.

Inner Point (VCU 36) - This drainage, located on the west side of Douglas Island, is popular with Juneau deer hunters. It is a small VCU containing mostly low-volume forest; it is also brushy, particularly at lower elevations. Access is sometimes difficult because of high winds and sea conditions in Stephens Passage. Pellet-group densities measured since 1985 have usually been moderate, between one and two pellet groups per plot, and 1996 was no different at 1.68 pellet groups per plot.

Hawk Inlet (VCU 128) - Hawk Inlet, on the NW shore of Admiralty Island, is a good baseline VCU for deer pellet sampling as it has been surveyed frequently since 1982. Access to Hawk Inlet is easy from Juneau by either plane or large vessel. All three transects traverse mid-volume timber on the west side of the inlet. Data collected at Hawk Inlet in 1996 indicate that deer populations remain at moderate levels.

Port Frederick (VCU 202) - Five transects were established at the head of Port Frederick on Chichagof Island in 1988. The transects traverse a wide array of timber types, aspects, and elevations and include high volume old growth. The transects were run again in 1995 because of concern by some Hoonah residents that deer populations were down around

their community. Pellet-group counts in 1996 were about 40% lower than in 1988; biologists believe most of this decline is attributable to the severe winter two years ago.

Suntaheen (VCU 209) - Three transects were established in Whitestone Harbor on northern Chichagof Island in 1988. These transects traverse a lot of muskeg and scrub; most of the better timber in the VCU is found along the beach fringe and creeks. Pellet-group densities in 1996 remained about the same as in previous years.

Pavlof (VCU 218) - Three transects were established in this VCU on eastern Chichagof Island in 1988. Two start near the falls at Pavlof Harbor and the third starts from the beach at Wachusetts Cove. A wide variety of habitat types are encountered. Pellet-group counts remained moderate in 1996.

Upper Tenakee (VCU 223) - Three transects were established in this VCU in upper Tenakee Inlet in 1988. Since that time considerable roading and logging operations have taken place. All three transects have a southerly aspect and traverse mostly low to mid-volume forest. Deer pellet-group density remained low in this VCU in 1996.

Saltery (VCU 231) - Three transects were established at Saltery Bay on Chichagof Island in 1988. Two transects climb hillsides through mid-volume hemlock, spruce, and cedar forest; the third transect traverses a riparian spruce stand. In 1996 pellet-group density was higher than in the past, but these results were probably inflated because of the reduced number of plots run due to snow.

Kadashan (VCU 235) - Three transects were established at Kadashan Bay on Chichagof Island in 1988. Two more were added by the Forest Service in 1992. All traverse mid to high volume forest. Only the first three transects were run in 1996, and because of snow only a limited number of plots were recorded. Deer pellet-group densities remained high at Kadashan at over 2 pellet groups per plot.

Finger Mountain (VCU 247) - The Finger River drainage, in lower Hoonah Sound, has consistently exhibited some of the highest deer pellet-group densities in all of Southeast. Three transects were established here in 1983. Transect #1 is a nice hike to an 1100 foot knob, then it undulates up and down from there. Transect #2 parallels the Finger River and usually has a tremendous amount of deer sign. Transect #3 is short and steep to 1500 feet elevation. Deer pellet-group densities remained high at Finger Mountain in 1996.

Nakwasina (VCU 300) - This VCU, north of Sitka, is a popular local hunting area which has been sampled almost every year since 1984. All three transects traverse mid-volume forest to 1500 feet elevation and have a southerly aspect. Typically, deer pellet-group densities have been very high at Nakwasina, and 1996 was no exception at 2.82 pellet groups per plot. This was the highest recorded density in Southeast Alaska this year.

Sealion Cove (VCU 305) - Located on northern Kruzof Island, this VCU has been sampled almost every year since 1984. Transects #1 and #3 are short and steep and run

through low to mid-volume timber until breaking out into sub-alpine vegetation at approximately 900 feet. Transect #2 also traverses low to mid-volume timber but does not reach the sub-alpine. Deer pellet-group densities were moderate in 1996.

Knight Island (VCU 361) - This VCU is part of the Russell Fiord Wilderness Area near Yakutat. Two transects were run in this VCU in 1996. One was on Knight Island; the other was at Chicago Harbor. The Knight Island transect traverses low volume hemlock stands with an abundant blueberry understory. The transect at Chicago Harbor is much steeper than the Knight Island transect and runs through more spruce. No deer pellets were found on either transect. Biologists believe deer have been eliminated from Knight Island from a combination of wolf predation and hunting pressure. Deer have always been rare in the Chicago Harbor area and the lack of pellets is no surprise there.

Yakutat Islands (VCU 368) - This VCU incorporates many of the islands found in Yakuatat Bay: Krutoi, Kriwoi, Khantaak, and Dolgoi. One or two transects were established on each island in 1991. Habitat is generally mid-volume hemlock with a blueberry understory. While the islands are not ideal deer habitat, the maritime influence, less snow, and lack of wolves probably explains the persistence of deer on these islands. In 1996 transects were run on Kriwoi, Khantaak, and Dolgoi islands; deer pellet-group density remained low.

Conclusion Island (VCU 417) - Located in Keku Strait 1.5 miles east of Kuiu Island, this VCU has historically been an important hunting area for residents of nearby Port Protection and Point Baker. The island is uniformly forested with mid to high-volume timber, and it supports an abundant understory of blueberry. Deer pellet-group density in 1996 was moderate at 1.45 pellet groups per plot.

Woewodski (VCU 448) - Three transects were located on southwestern Mitkof Island in 1984. They are all well-marked and easily accessible by skiff from Petersburg. All climb to 1500 feet through moderate volume timber. Deer pellet-group density in 1996 was high at 2.25 pellet groups per plot.

Muddy River (VCU 489) - Three transects were established in the Muddy River area in 1996 by the US Forest Service. Most of the old growth timber traversed is low volume; there's also some second growth on the transects. Both deer and moose use the area; deer pellet-group density was moderate at 1.53 pellet groups per plot, and blueberry observed along the transects was heavily browsed.

Red Bay (VCU 532) - Located on northern Prince of Wales Island, this VCU was first sampled in 1987. Red Bay has been extensively logged, making it difficult to avoid clearcuts and young second-growth. Pellet-group density was moderate at 1.19 pellet groups per plot in 1996.

Sarheen (VCU 549) - Three transects were located at Sarheen on the NW coast of Prince of Wales in 1989. Sarheen was selected because it is mostly unlogged, protected from

rough seas, and hunters reported good success here. The transects traverse mostly low volume timber and reach approximately 800 feet elevation. Deer pellet-group density in 1996 was lower than in 1989 at 1.00 pellet groups per plot.

Warm Chuck (VCU 561) - Located on Heceta Island off the west coast of Prince of Wales Island, this VCU is a popular hunting destination. Transects were established here in 1984 because of reported high deer populations. Transect #1 travels up a well-timbered valley bottom; #2 traverses a flat poorly-drained area with low-volume timber; and #3 climbs a steep hill to 1500 feet elevation. Significant portions of transects #1 and #2 have been logged since 1984. In 1996 deer pellet group densities were moderate at 1.39 pellet groups per plot.

George Inlet (VCU 748) -This VCU on Revilla Island is easily accessible by skiff from Ketchikan. Transect #1 is short and steep to 1400 feet elevation and traverses high volume timber. Transects #2 and #3 are longer and flatter and contain a greater variety of forest types including cedar stands and muskeg. Deer pellet-group density in 1996 remained relatively stable at 0.98 pellet groups per plot.

Dall Head (VCU 765) - This VCU was first sampled in a minor way in 1981. A more complete effort was planned for 1996 when three permanent transects were established. Much of Dall Head has been exposed to windthrow and fire and consequently there are large areas that are in secondgrowth, including some well stocked red cedar stands. Most understory encountered was brushy conifer mixed with salal. Overall deer pellet-group density at Dall Head was moderate at 1.07 pellet groups per plot.

Duke Island (VCU 767) - Three transects were established on the north end of Duke Island in 1996. There was a fair amount of brush on some transects, including four foot high salal. Most of the timber was low volume and consisted of mixed conifer classes. Pacific yew was observed along the beach fringe. There was not much in the way of forbs in the understory and only a moderate amount of blueberry present. Deer presence on all three transects was negligible - they occur on the island, but in no great numbers.

Alava Bay (VCU 769) - This VCU, located on the southeastern tip of Revilla Island, was first sampled in 1985. All three transects have steep sections in them and all are brushy with blueberry thickets to four feet tall. Forest types are diverse ranging from muskeg to high volume old growth. Pellet-group density remained low in 1996 at 0.93 pellet groups per plot.

Gravina (VCU 999) - Northeastern Gravina Island was sampled at moderate levels in 1981 and at intensive levels in 1984, 1985, and 1986. In 1987, sampling was reduced to three transects (Nos. 1,2, and 3). These transects are readily accessible from the Ketchikan airport. Since 1989 pellet-group densities have been moderate on Gravina Island and 1996 results continued that trend.

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
20	Comet	9,662	12%	1994	180	0.00	0.00-0.00
27	Auke Bay	15,245	45%	1987	381	0.99	0.87-1.12
35	North Douglas	4,430	49%	1991	300	0.80	0.65-0.96
				93	324	0.74	0.62-0.87
				94	315	0.91	0.74-1.09
				95	306	0.86	0.70-1.02
				96	**323**	**0.97**	**0.81-1.12**
36	Inner Point	3,965	44%	1985	256	1.30	1.10-1.51
				86	235	1.97	1.68-2.25
				87	262	1.76	1.53-2.00
				88	200	1.21	1.02-1.39
				89	258	1.31	1.08-1.53
				92	204	2.05	1.75-2.36
				95	254	1.41	1.21-1.60
				96	**240**	**1.68**	**1.45-1.91**
65	Sumdum Glacier	40,906	15%	1987	262	1.76	1.53-2.00
82	Negro Creek	12,212	31%	1989	312	0.21	0.13-0.29
89	Farragut Bay	na	na	1994	314	0.02	0.00-0.04
94	Sullivan Island	3,985	78%	1990	250	1.39	1.17-1.62
117	Couverden	9,933	10%	1993	350	0.35	0.27-0.44
124	Shelter Island (All Transects)	6,162	43%	1984	713	1.46	1.33-1.60
				85	774	1.82	1.67-1.97
				86	727	2.20	2.02-2.37
124	Shelter Island (Trans. 4-8, 18)			1984	300	1.52	1.34-1.70
				85	296	2.52	2.24-2.81
				86	292	3.24	2.91-3.57
				87	288	2.91	2.57-3.24
				88	130	3.16	2.62-3.70
				89	300	1.43	1.23-1.62
				90	300	1.60	1.37-1.82
				93	250	2.00	1.73-2.26
				95	297	1.38	1.20-1.56

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
125	Barlow Cove	13,712	24%	1982	2,567	1.07	1.01-1.12
				84	347	1.69	1.46-1.92
				85	347	1.55	1.35-1.76
				90	270	1.42	1.18-1.65
127	Calm Station	4,941	66%	1982	1,054	1.65	1.53-1.77
128	Hawk Inlet	14,318	57%	1982	1,605	1.21	0.99-1.42
				84	339	1.42	1.22-1.63
				85	270	1.69	1.43-1.95
				86	286	1.92	1.64-2.19
				87	278	2.54	2.19-2.89
				89	364	1.82	1.56-2.08
				90	250	2.24	1.94-2.53
				92	319	1.61	1.38-1.83
				96	**325**	**1.26**	**1.07-1.46**
140	Dorn Island	9,485	81%	1984	230	1.27	1.02-1.53
148	Lake Kathleen	14,693	57%	1987	207	2.13	1.76-2.49
150	Lake Florence	21,342	52%	1988	294	1.48	1.27-1.69
162	Thayer Lake	25,342	79%	1987	313	2.81	2.49-3.12
				89	283	2.04	1.75-2.32
				94	282	2.27	1.98-2.56
171	Hood Bay	44,355	79%	1987	358	2.31	1.99-2.63
				89	366	1.77	1.54-2.00
				90	375	1.85	1.61-2.09
				92	360	1.91	1.64-2.18
				94	371	1.64	1.41-1.88
182	Pybus Bay	41,501	62%	1981	390	1.34	1.16-1.52
				84	300	1.02	0.86-1.18
				85	269	1.86	1.60-2.12
				86	235	2.00	1.70-2.29
				87	242	2.03	1.69-2.37
				89	199	2.00	1.63-2.36
				90	221	1.72	1.44-2.01
				92	236	1.13	0.97-1.30
				95	205	1.48	1.23-1.74

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
185	Pleasant Island	8,738	16%	1991	311	1.38	1.18-1.57
				92	210	1.34	1.09-1.59
				93	305	1.77	1.52-2.02
				94	356	1.22	1.04-1.40
189	Port Althorp	8,040	27%	1988	195	1.80	1.47-2.13
				91	223	1.92	1.55-2.29
				92	261	1.36	1.11-1.60
				93	248	1.39	1.15-1.62
				94	253	1.31	1.06-1.56
190	Idaho Inlet	53,183	22%	1988	258	1.34	1.09-1.60
				92	219	0.94	0.69-1.19
				93	305	0.56	0.45-0.68
				94	294	0.71	0.58-0.84
202	Port Frederick	16,619	52%	1988	242	1.87	1.62-2.13
				96	**226**	**1.02**	**0.82-1.23**
208	First No. 2	6,613	32%	1983	1,155	1.12	1.01-1.22
209	Suntaheen Cr.	13,198	49%	1988	272	1.22	1.00-1.44
				92	271	1.13	0.94-1.33
				93	265	0.73	0.58-0.88
				94	272	1.05	0.81-1.29
				96	**276**	**0.98**	**0.77-1.18**
211	Point Augusta	4,688	63%	1983	757	1.78	1.62-2.01
				93	286	2.08	1.80-2.36
218	Pavlof River	18,866	50%	1988	325	1.78	1.50-2.06
				92	341	1.56	1.32-1.81
				96	**349**	**1.50**	**1.30-1.70**
221	Whip Station	4,708	53%	1981	193	0.86	0.64-1.08
222	Sand Station	12,231	50%	1981	253	0.60	0.48-0.73
223	Upper Tenakee	3,833	54%	1988	253	1.47	1.24-1.70
				92	265	0.58	0.47-0.70
				93	249	0.47	0.36-0.58
				94	319	0.61	0.48-0.74
				96	**263**	**0.56**	**0.38-0.75**

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
231	Saltery Bay	18,478	31%	1988	256	2.02	1.69-2.35
				92	256	0.96	0.79-1.14
				93	227	0.76	0.56-0.96
				94	193	0.97	0.79-1.15
				96	**152**	**1.90**	**1.47-2.33**
234	Inbetween	6,002	62%	1981	35	0.49	0.08-0.89
235	Kadashan	33,641	53%	1981	96	0.54	0.32-0.76
				88	221	2.67	2.18-3.16
				92	282	1.62	1.38-1.86
				93	385	1.12	0.95-1.30
				94	294	1.39	1.18-1.60
				95	195	2.64	2.20-3.07
				96	**204**	**2.36**	**1.96-2.76**
236	Corner Bay	10,930	66%	1981	60	0.35	0.17-0.53
				92	206	2.27	1.91-2.64
				93	50	1.72	1.25-2.19
				94	198	1.69	1.41-1.98
246	Broad Island	17,145	38%	1981	209	1.41	1.18-1.63
247	Finger Mountain.	15,918	38%	1983	2,145	1.17	1.11-1.24
				84	302	1.83	1.57-2.09
				85	279	3.23	2.79-3.67
				86	277	2.88	2.57-3.19
				87	236	3.11	2.71-3.52
				89	305	2.99	2.57-3.40
				90	225	3.36	2.99-3.74
				91	150	3.93	3.36-4.51
				92	207	2.85	2.48-3.22
				93	179	3.03	2.60-3.47
				94	275	2.29	1.96-2.62
				96	**221**	**2.62**	**2.20-3.04**
249	Lisianski	19,677	24%	1988	255	0.97	0.79-1.14
				91	170	1.53	1.22-1.84
				95	317	0.70	0.56-0.85

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
254	Soapstone	17,695	29%	1988	274	1.92	1.67-2.17
				91	270	2.05	1.77-2.33
				93	243	1.88	1.59-2.16
				94	310	1.34	1.16-1.52
				95	283	1.48	1.27-1.69
271	Chichagof	20,680	10%	1991	301	1.39	1.19-1.58
				95	303	0.98	0.83-1.14
275	Cobol	14,618	49%	1984	224	1.15	0.92-1.37
				91	185	2.96	2.37-3.54
				95	218	1.45	1.16-1.74
279	Rapids Point	7,637	65%	1983	2,734	0.77	0.73-0.81
281	Ushk Bay	20,770	38%	1981	94	0.63	0.41-0.85
288	Range Creek	6,929	33%	1983	1,788	0.51	0.46-0.55
				84	303	0.71	0.61-0.92
				85	224	1.32	1.02-1.62
295	Lake Eva	12,362	65%	1987	172	1.81	1.46-2.15
296	Portage Arm	16,101	59%	1981	213	0.53	0.39-0.68
				90	214	3.09	2.70-3.48
298	Middle Arm Kelp Bay	28,424	21%	1990	306	2.68	2.35-3.01
300	Nakwasina (All Transects)	19,575	48%	1984	196	2.51	2.14-2.88
				85	1046	3.92	3.67-4.17
				86	715	3.50	3.26-3.76

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
300	Nakwasina (Trans. 2,3,8)			1984	138	2.51	2.10-2.93
				85	218	3.65	3.13-4.17
				86	205	3.38	2.91-3.84
				87	195	2.31	1.90-2.71
				89	244	2.32	2.00-2.65
				90	255	2.98	2.56-3.40
				91	175	3.98	3.39-4.57
				92	223	1.64	1.37-1.90
				93	188	3.15	2.70-3.60
				94	230	1.46	1.24-1.68
				95	216	1.75	1.48-2.10
				96	**210**	**2.82**	**2.35-3.29**
305	Sealion Cove	9,293	69%	1984	320	1.36	1.15-1.58
				85	292	2.57	2.23-2.91
				86	235	2.87	2.44-3.29
				87	226	3.31	2.82-3.80
				89	303	1.75	1.50-2.00
				90	227	2.03	1.71-2.35
				91	219	1.63	1.36-1.91
				92	239	1.30	1.08-1.51
				93	198	1.70	1.38-2.02
				94	221	1.29	1.09-1.48
				95	210	1.30	1.08-1.52
				96	**225**	**1.63**	**1.35-1.90**
308	South Kruzof	71,158	25%	1993	345	1.62	1.41-1.83
				94	370	1.71	1.52-1.90
315	Basin Kelp Bay	8,460	60%	1990	151	1.85	1.41-2.28
321	Redoubt Bay	9,045	58%	1989	304	2.17	1.88-2.47
339	Cape Ommaney	13,725	32%	1988	172	1.74	1.43-2.05
348	West Crawfish	57,434	16%	1989	360	1.35	1.36-1.57
361	Knight Island	10,419	40%	1991	100	0.81	0.61-1.01
				92	100	0.95	0.74-1.16
				94	90	0.44	0.25-0.64
				96	**153**	**0.00**	**0.00-0.00**

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
363	Humpback	7,721	74%	1991	118	0.01	0.00-0.03
368	Yakutat Islands	1,021	99%	1991	415	0.32	0.24-0.39
				92	243	0.48	0.37-0.58
				93	106	1.07	0.81-1.32
				94	251	0.66	0.52-0.80
				96	**379**	**0.59**	**0.48-0.69**
369	Ankau	---	---	1991	116	0.03	0.00-0.05
400	Security Bay	28,040	79%	1984	360	0.02	0.01-0.04
				89	304	0.25	0.16-0.34
				95	268	0.22	0.15-0.29
403	Pillar Bay	28,227	65%	1988	337	0.16	0.10-0.22
408	Malmesbury	18,151	68%	1990	206	0.11	0.05-0.18
417	Conclusion Island	12,561	99%	1987	207	2.66	2.32-3.01
				89	200	0.95	0.72-1.18
				91	200	0.71	0.53-0.88
				96	**191**	**1.45**	**1.19-1.70**
427	Big John Bay	32,711	29%	1994	300	0.38	0.29-0.48
428	Rocky Pass	49,403	35%	1989	298	0.40	0.27-0.53
431	Point Barrie	22,187	27%	1988	357	0.23	0.17-0.29
				93	375	0.77	0.64-0.90
434a	Big Level Island	727	61%	1981	399	1.54	1.45-1.63
				83	336	1.56	
				86	382	1.66	1.41-1.90
				89	227	1.07	
				91	456	2.16	1.90-2.41
434b	Little Level Island	263	92%	1981	114	2.48	2.02-2.94
				83	136	2.34	
				86	122	1.39	1.07-1.70
				89	137	1.52	
				91	132	3.59	3.07-4.11

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
435	Castle River	32,724	36%	1984	312	0.19	0.12-0.26
				87	305	0.51	0.37-0.65
				89	312	0.40	0.25-0.56
				94	310	0.32	0.24-0.40
437	E. Duncan	23,744	55%	1990	227	1.12	0.92-1.32
				92	213	0.78	0.63-0.94
442	Portage Bay	11,269	49%	1993	282	0.43	0.31-0.56
				95	277	0.43	0.33-0.53
448	Woewodski	20,931	53%	1984	295	0.88	0.69-1.08
				85	209	1.00	0.82-1.19
				87	195	1.65	1.85-2.61
				88	433	1.33	1.16-1.51
				89	417	1.35	1.24-1.73
				90	355	1.46	1.28-1.64
				91	316	1.80	1.52-2.07
				92	248	0.79	0.62-0.97
				93	230	1.06	0.85-1.27
				94	152	1.14	0.82-1.46
				95	157	1.38	1.08-1.67
				96	**243**	**2.25**	**1.95-2.55**
448a	Woewodski Island	20,931	53%	1991	461	1.86	1.66-2.05
				94	510	1.30	1.15-1.46
449	Frederick	6,835	70%	1981	945	0.08	0.06-0.11
				90	180	0.55	0.36-0.74
				92	227	0.54	0.42-0.65
452	Blind Slough	30,655	55%	1990	324	1.35	1.15-1.56
				92	114	1.04	0.77-1.30
				93	265	1.28	1.04-1.51
454	Dry	11,033	74%	1981	91	0.92	0.56-1.28
				93	210	1.44	1.17-1.72
455	Vank	8,437	99%	1981			
	a) Sokolof				900	1.73	1.61-1.85
	b) Rynda				281	0.25	0.18-0.32
	c) Greys				284	0.25	0.18-0.32

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
458	Snow Passage	31,572	46%	1994	345	0.58	0.45-0.70
461	Woronkofski (All Transects)	14,500	63%	1985	646	1.63	1.45-1.81
461	Woronkofski (Trans. 10,11,12)			1985	218	2.01	1.62-2.39
				87	201	2.23	1.85-2.61
				89	223	2.52	2.18-2.85
				91	203	1.59	1.32-1.85
				93	225	0.22	0.13-0.31
				94	224	0.26	0.18-0.34
467	Mosman	25,573	54%	1993	304	0.07	0.03-0.11
473	Onslow	28,947	55%	1984	321	0.37	0.28-0.46
				85	334	0.59	0.48-0.70
				86	347	0.72	0.59-0.84
				87	336	0.42	0.31-0.55
				88	329	0.44	0.32-0.55
				91	322	0.66	0.51-0.80
				93	341	0.68	0.55-0.82
				94	340	0.88	0.74-1.02
480	Fools Inlet	30,906	44%	1994	194	0.54	0.38-0.70
489	Muddy River	40,275	37%	**1996**	**348**	**1.53**	**1.26-1.80**
524	Frosty Bay	17,959	41%	1991	266	0.70	0.55-0.86
528	Mt. Calder	9,232	83%	1988	252	2.14	1.78-2.49
532	Red Bay	15,145	66%	1987	177	0.32	0.18-0.47
				94	256	0.94	0.74-1.14
				96	**281**	**1.19**	**0.97-1.41**
539	Exchange Cove	10,406	74%	1988	266	1.39	1.15-1.64
				92	125	1.10	0.83-1.38
549	Sarheen	11,875	52%	1989	310	1.73	1.44-2.01
				96	**334**	**1.00**	**0.83-1.16**

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
554	Sarkar	32,183	60%	1988	298	1.28	1.06-1.50
				92	245	0.53	0.41-0.66
				94	292	0.92	0.77-1.07
561	Warm Chuck	12,348	85%	1984	326	1.02	1.02-1.38
				85	295	1.60	1.36-1.84
				89	302	2.21	1.91-2.50
				91	291	2.05	1.73-2.37
				96	**276**	**1.39**	**1.17-1.61**
564	Coronation	19,107	69%	1983	696	1.20	1.04-1.36
				85	228	2.34	
				88	408	1.41	1.17-1.66
				89	293	1.63	1.28-1.98
569	Baker	31,802	68%	1991	256	0.08	0.04-0.12
575	Thorne Lake	17,970	68%	1992	334	1.20	1.03-1.37
				94	293	0.76	0.62-0.91
				95	299	1.27	1.09-1.45
578	Snakey Lakes	6,431	84%	1986	279	0.62	0.51-0.73
				88	300	1.05	0.84-1.26
				89	200	1.56	1.26-1.86
				93	356	0.77	0.61-0.93
581	Luck Lake	19,818	67%	1986	178	1.74	1.41-2.07
				88	300	2.11	1.80-2.41
				93	175	1.10	0.87-1.32
584	Little Ratz	12,392	65%	1992	272	0.94	0.76-1.13
587	Tuxekan	12,129	77%	1988	300	1.06	0.84-1.28

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
621	12 Mile	23,344	59%	1985	196	0.31	0.19-0.43
				86	300	0.64	0.48-0.81
				87	370	0.65	0.49-0.81
				88	302	0.62	0.46-0.77
				89	235	0.78	0.59-0.98
				90	176	1.18	0.84-1.52
				91	231	1.84	1.48-2.21
				92	250	0.43	0.32-0.55
				93	258	0.84	0.63-1.05
				94	324	0.93	0.76-1.09
625	Trocadero	16,624	75%	1995	235	1.74	1.41-2.06
635	Port Refugio	9,118	50%	1985	317	2.69	2.27-3.12
				86	324	2.52	2.09-2.96
				87	369	1.76	1.46-2.07
				88	270	1.15	0.90-1.40
				89	507	0.80	0.68-0.93
				90	232	1.25	1.03-1.48
				91	367	1.13	0.95-1.32
				92	254	0.76	0.57-0.95
				93	213	1.35	0.98-1.71
				94	280	1.85	1.51-2.19
679	Kitkun Bay	15,359	75%	1988	240	0.31	0.20-0.42
				89	273	0.89	0.71-1.07
				95	264	0.40	0.28-0.52
685	Nutkwa	17,079	73%	1988	234	0.09	0.02-0.16
716	Helm Bay	16,127	57%	1981	704	0.16	0.12-0.19
				84	302	0.54	0.44-0.65
				85	181	0.85	0.65-1.05
				88	247	1.66	1.38-1.95
				91	240	1.63	1.35-1.92
				92	169	1.25	0.96-1.53
				93	286	1.37	1.16-1.59
				95	284	1.31	1.09-1.52
719	Port Stewart	21,482	55%	1993	289	1.22	1.03-1.42
				95	278	1.61	1.35-1.87

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
722	Spacious Bay	31,461	44%	1993	300	0.54	0.43-0.64
				95	283	0.45	0.35-0.54
738	Margaret	19,286	67%	1985	515	0.57	0.47-0.66
				86	251	0.84	0.69-1.00
				88	110	1.31	0.96-1.67
				89	129	0.62	0.44-0.80
				90	274	0.56	0.44-0.68
				91	272	0.76	0.58-0.94
				93	281	0.31	0.23-0.39
				95	304	0.70	0.56-0.84
748	George Inlet	19,448	28%	1981	110	0.21	0.09-0.33
				84	344	0.27	0.19-0.35
				85	313	0.52	0.39-0.65
				89	169	1.41	1.08-1.75
				90	240	1.03	0.82-1.25
				91	168	1.49	1.15-1.84
				92	195	0.65	0.49-0.81
				94	309	0.95	0.79-1.11
				96	**305**	**0.98**	**0.76-1.19**
752	Whitman Lake	6,015	38%	1981	45	0.18	0.02-0.33
				87	187	0.16	0.09-0.23
				90	193	0.46	0.32-0.59
				92	189	0.20	0.12-0.28
758	Carroll Pt.	11,629	34%	1985	118	0.66	0.46-0.86
				86	118	0.75	0.56-0.95
				88	85	1.15	0.81-1.48
				92	87	0.28	0.14-0.41
				94	125	0.70	0.49-0.90
759	Moth Bay	7,652	23%	1985	140	0.59	0.42-0.74
				86	156	0.98	0.79-1.17
				88	78	0.71	0.46-0.97
				92	136	0.48	0.30-0.66
				94	136	0.94	0.71-1.17

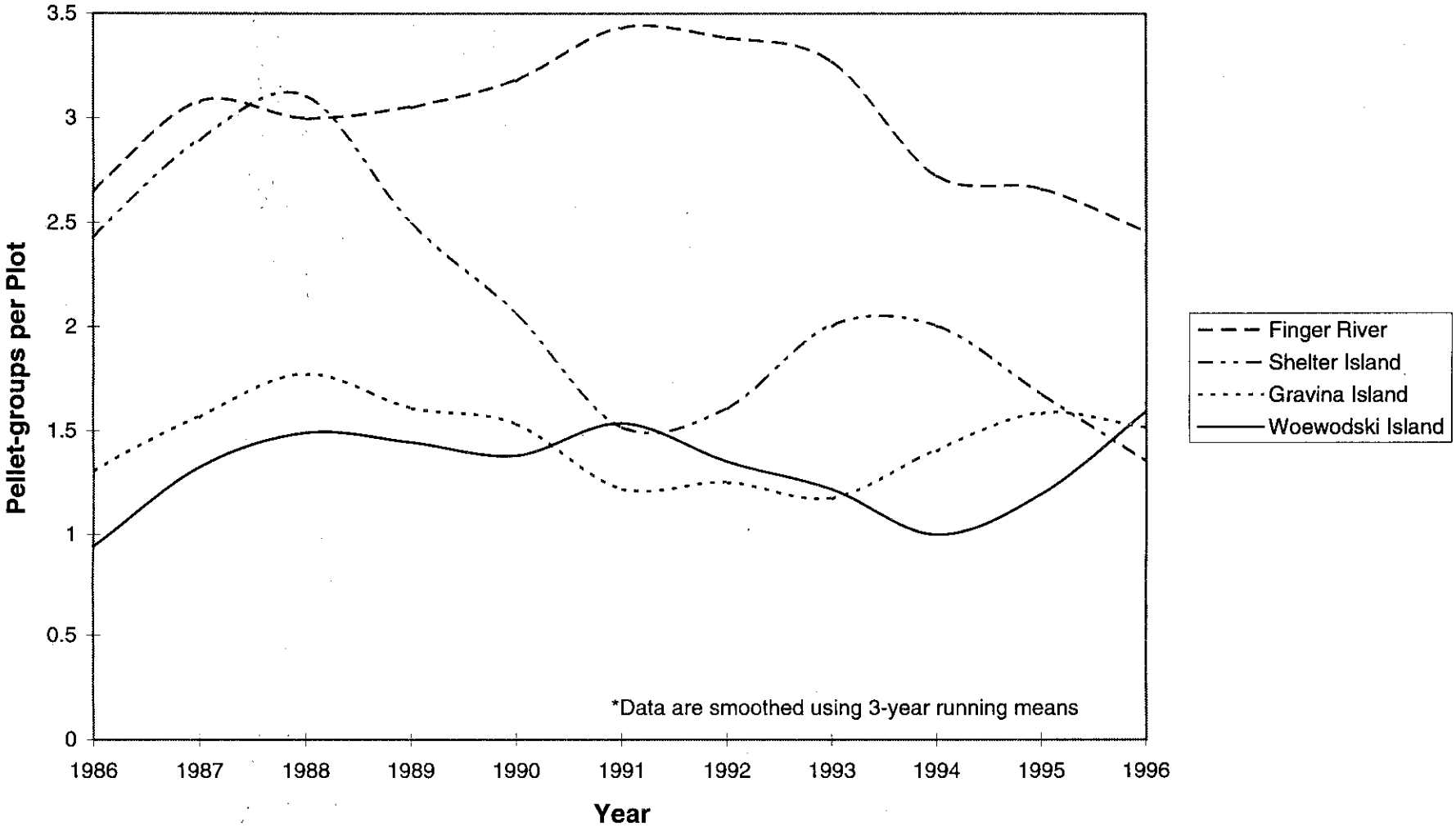
Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
760	Lucky Cove	12,377	43%	1985	335	1.16	1.00-1.33
				86	258	1.16	0.95-1.32
				88	65	1.01	0.68-1.34
				90	263	1.10	0.92-1.27
				91	271	1.39	1.07-1.70
764	Blank Inlet	3,640	19%	1981	108	1.24	0.89-1.59
765	Dall Head	4,803	63%	1981	69	0.52	0.31-0.74
				96	**295**	**1.07**	**0.90-1.24**
767	Duke Island	39,171	17%	**1996**	**294**	**0.05**	**0.02-0.09**
769	Alava Bay	13,563	60%	1985	311	0.52	0.39-0.65
				86	326	0.85	0.68-1.01
				91	143	1.64	1.22-2.05
				94	326	0.79	0.64-0.94
				96	**324**	**0.93**	**0.77-1.09**
772	Wasp Cove	4,882	90%	1985	271	0.41	0.31-0.51
				86	300	0.50	0.38-0.62
				89	145	0.58	0.39-0.77
				91	207	0.13	0.07-0.18
821	Winstanley Island	14,104	45%	1991	49	0.27	0.11-0.42
999	Gravina (All Transects)			1981	226	1.06	0.89-1.22
				84	1,087	0.86	0.78-0.94
				85	1,172	1.23	1.13-1.32
				86	1,267	1.40	1.30-1.50

Table 1. Pellet-group count statistics from southeast Alaska, 1981-96.

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95% CI
999	Gravina (Trans. 1,2,3)			1984	376	0.88	0.73-1.03
				85	224	1.44	1.20-1.67
				86	346	1.62	1.43-1.81
				87	334	1.63	1.41-1.84
				88	278	2.06	1.78-2.35
				89	182	1.13	0.86-1.41
				90	279	1.40	1.12-1.68
				91	154	1.12	0.80-1.43
				92	302	1.22	1.05-1.38
				94	331	1.58	1.37-1.79
				96	**338**	**1.47**	**1.28-1.67**

Pellet-group Densities on Selected Watersheds, Southeast Alaska, 1986-96*

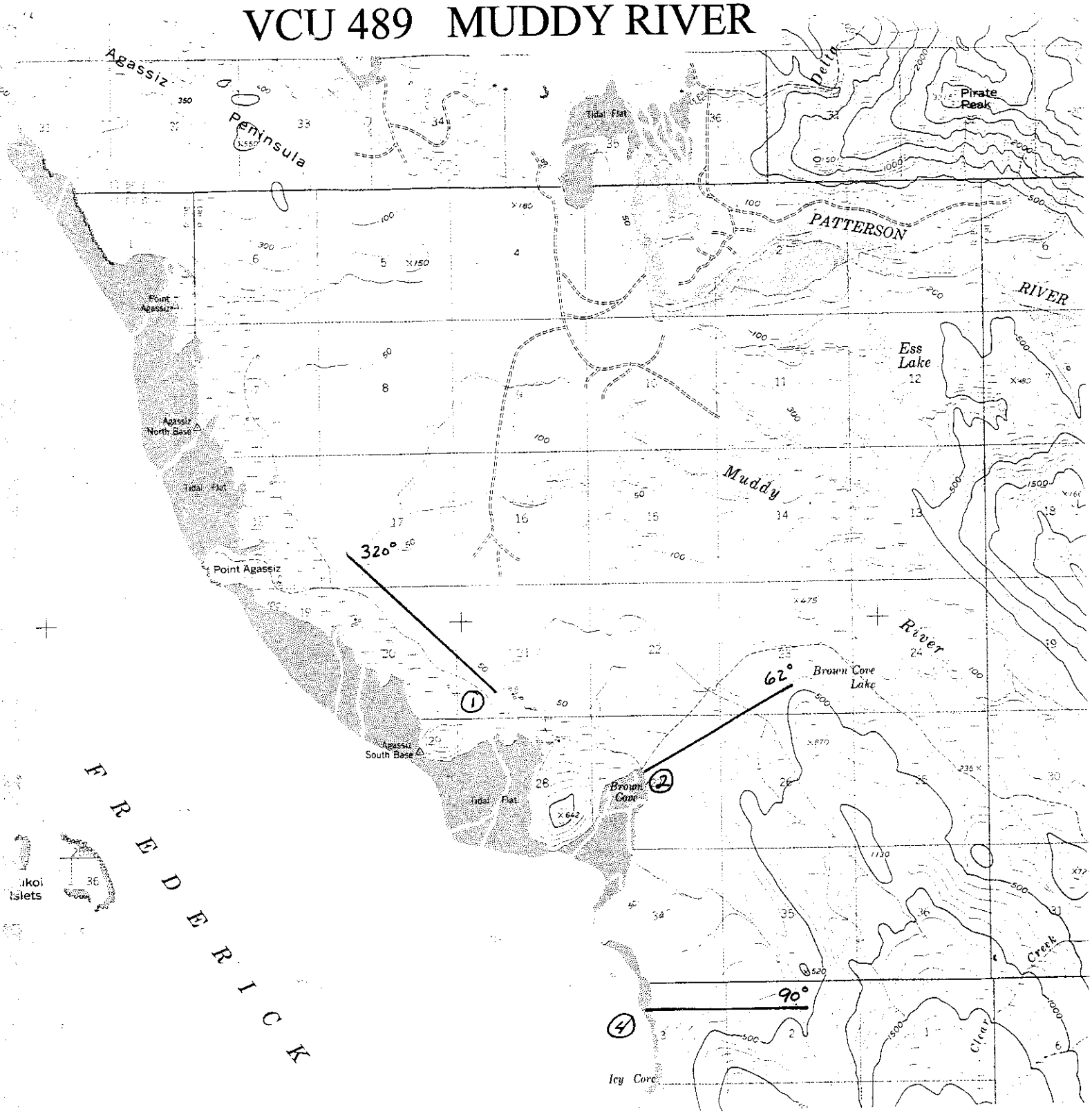


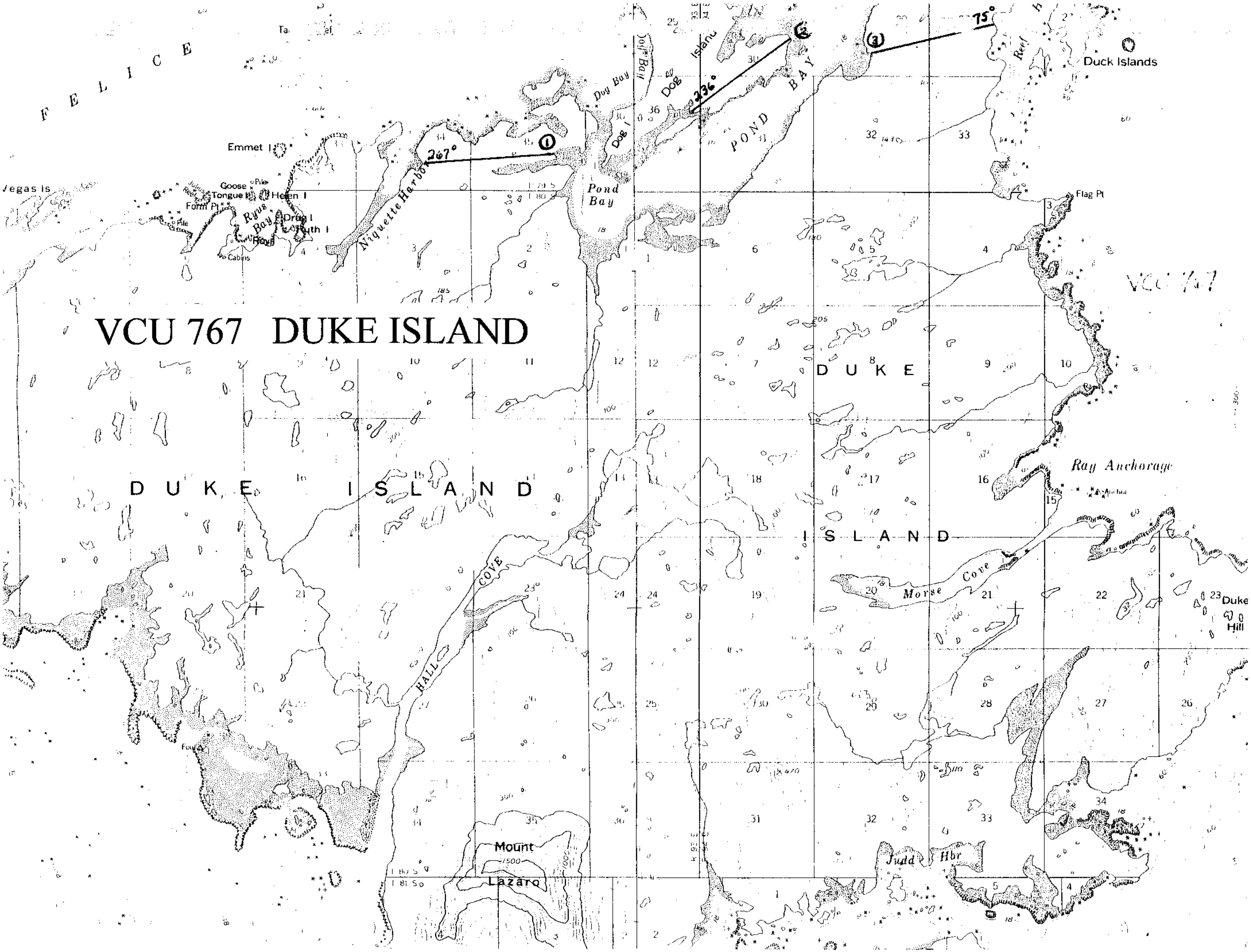
APPENDIX I

New VCU's Sampled in 1996[a]

[a] Transect location forms for these and all other VCU's are located in the ADF&G Southeast Regional Office, Douglas.

VCU 489 MUDDY RIVER




VCU 767 DUKE ISLAND
DUKE ISLAND
DUKE ISLAND
FELICE
Duck Islands
Reef
Flag Pt
Ray Anchorage
Pond Bay
POND BAY
Dog Bay
Dog I
Dog Island
Niquette Harbor
Emmet I
Vegas Is
Goose
Tongue I
Helen I
Form Pt
Ryus Bay
Drug I
Ruth I
Cabins
Morse Cove
HALL COVE
Judd Hbr
Mount Lazaro
Duke Hill
267°
236°
75°

APPENDIX II

Winter Weather Conditions

1996

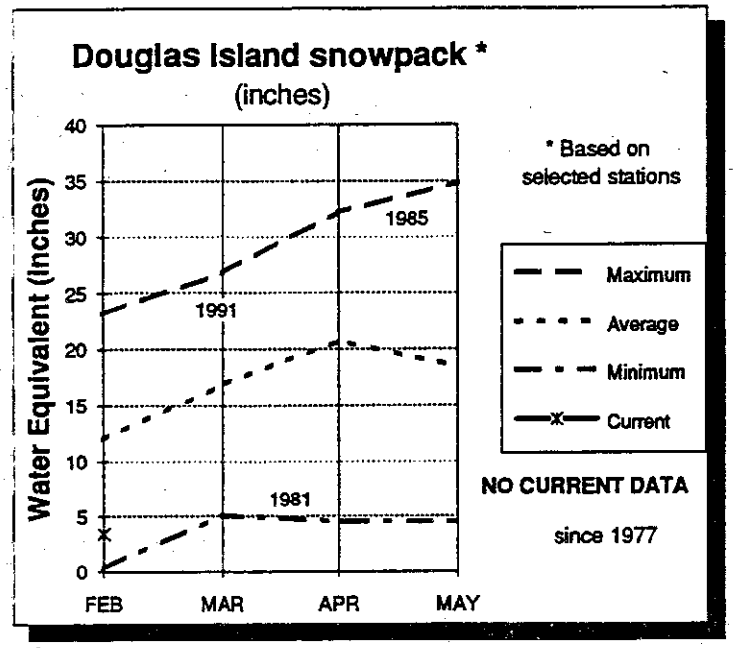
Winter Weather Conditions

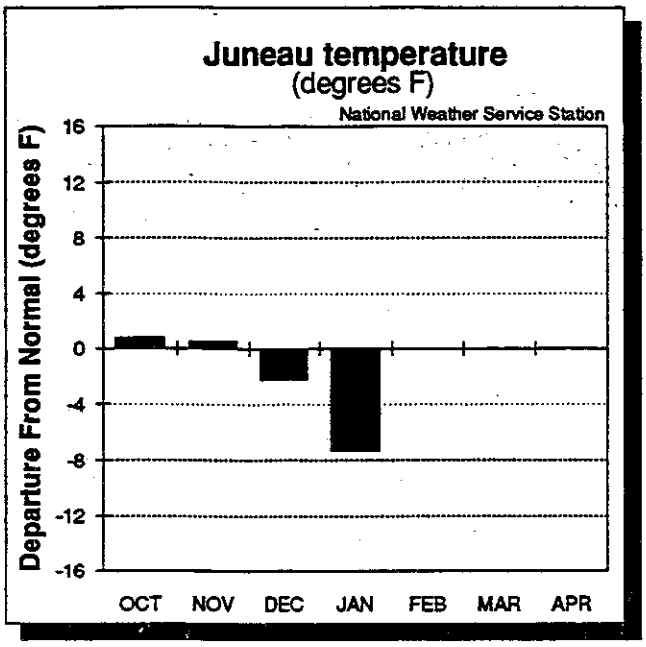
January - April 1996

Data from: Alaska Snow Surveys, USDA Soil Conservation Service, Anchorage, AK.
Monthly reports on file, ADF&G, Douglas.

Southeast

February 1, 1996





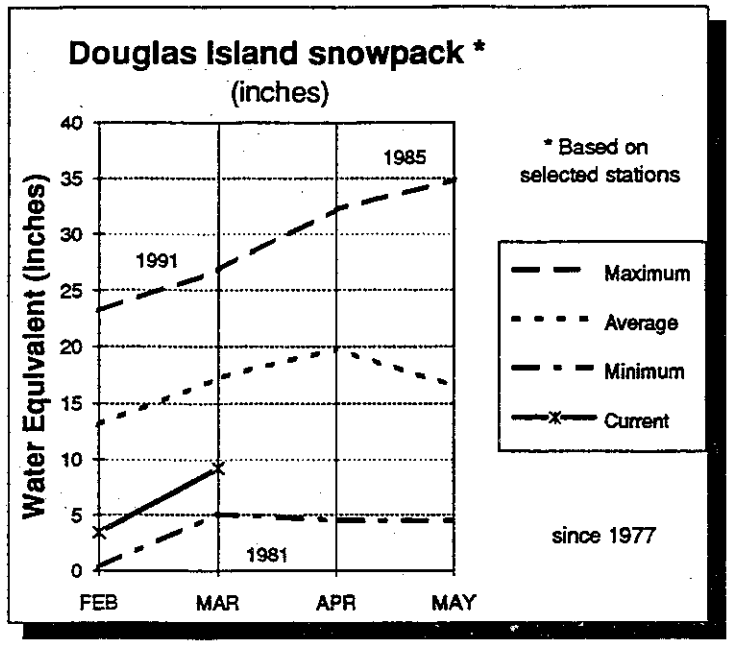
SNOWCOVER:

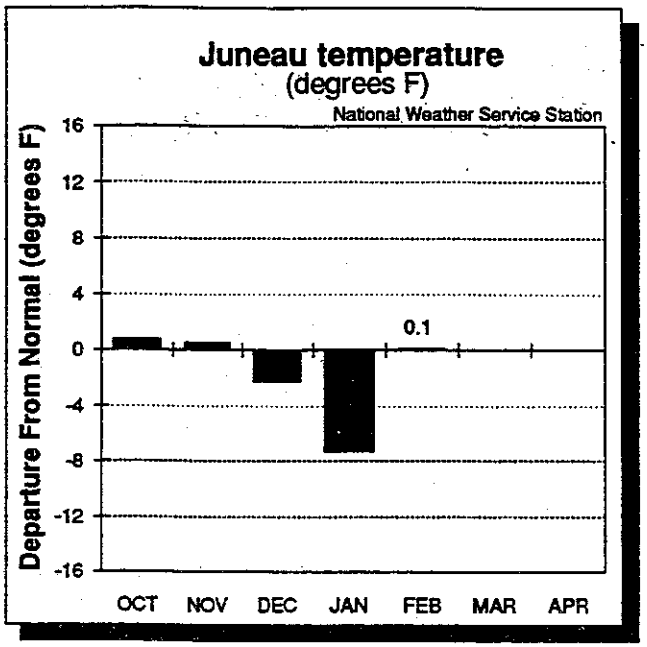
With the exception of 1981, this is the least amount of snow for the Juneau and Petersburg areas since records began in 1977 and 1979 respectively. That year had no snow at the snow courses in their respecive regions.

For more information, contact your Natural Resources Conservation Service office in Anchorage, 271-2424.

Southeast

March 1, 1996





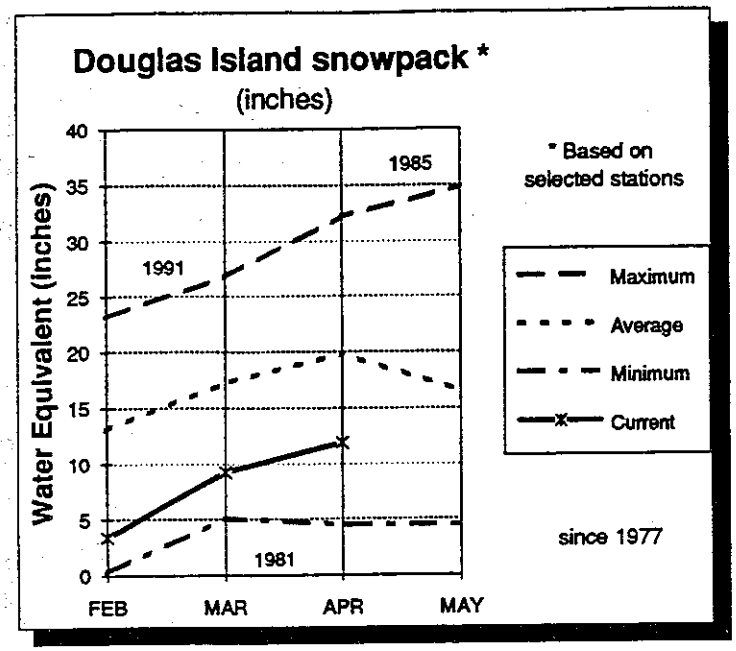
SNOWCOVER:

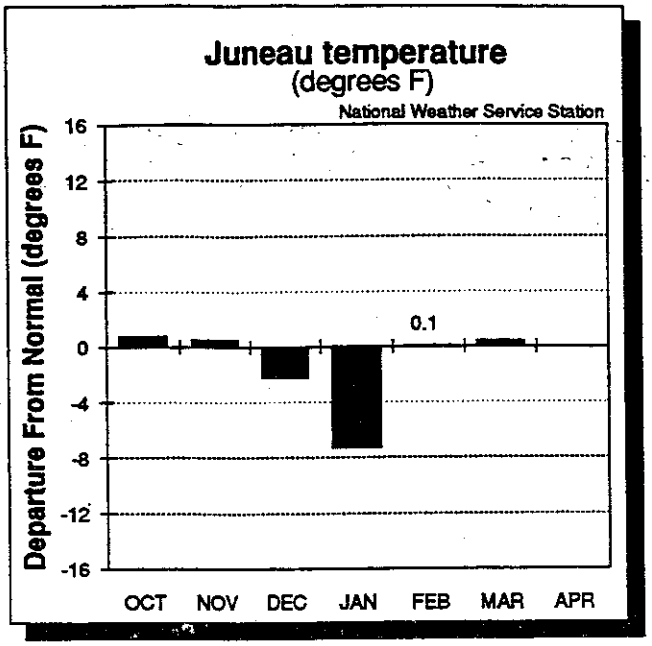
The Petersburg snow courses range from 48 to 58 percent of normal. The snow courses on Douglas Island vary from 77 percent of normal at Fish Creek to 46 percent at Cropley Lake. This indicates the high elevations are much, much below normal in the Southeast region of the state.

For more information, contact your Natural Resources Conservation Service office in Anchorage, 271-2424.

Southeast

April 1, 1996





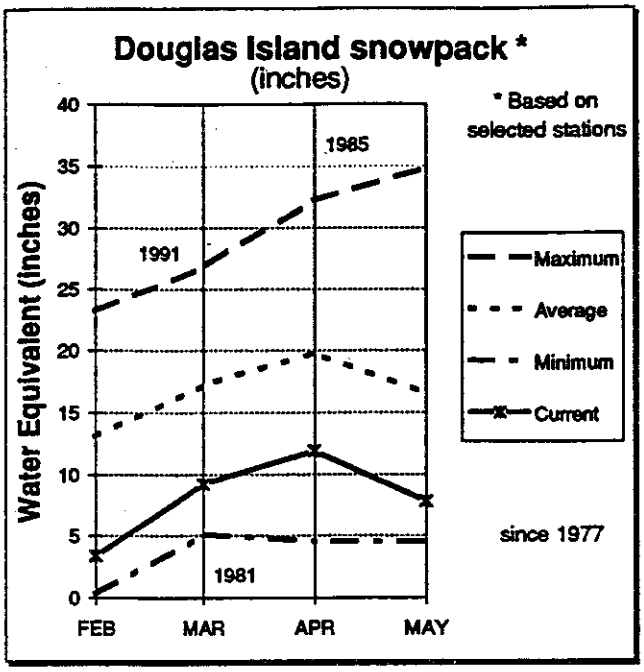
SNOWCOVER:

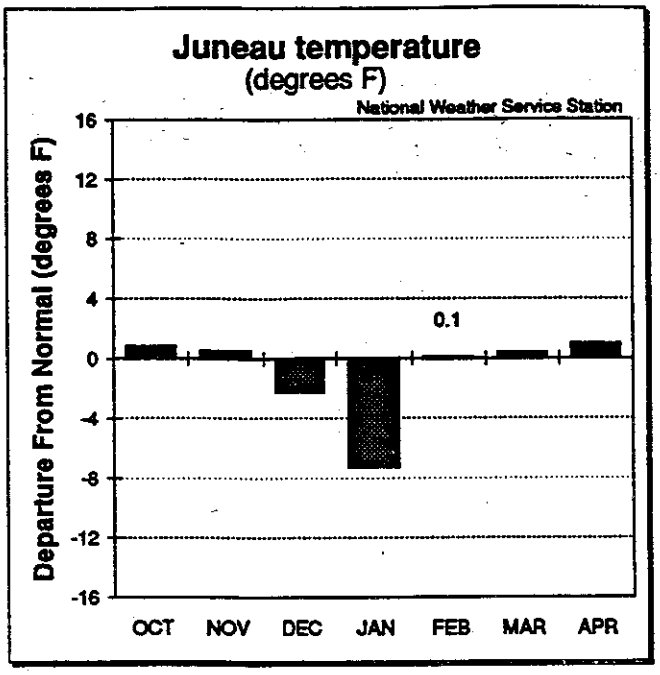
The streamflow volume for Gold Creek is expected to be 81 percent of its normal flow. The Cropley Lake snow course, measured by volunteer Rich Lomire of the Alaskan Weather Records, is 49.6 percent of normal, indicating that higher elevation snowpacks are much, much below average. The Swan Lake snow courses were measured and the water content varies from 0.5 of an inch at the Upper Swan Lake course to 26.0 inches at Lake Grace Pass, about 60 percent of last years water content.

For more information, contact your Natural Resources Conservation Service office in Anchorage, 271-2424.

Southeast

May 1, 1996





SNOWCOVER:

The Speel River snow course measured 47 percent of normal snow water content for May 1st. The Snettisham precipitation gage has caught 81.2 inches since October 1st, 70 percent of normal. The Speel River snow course and the Snettisham precipitation gage are read by the Alaska Power Administration.

The Moore Creek Bridge snow course, north of Skagway, measured 15.3 inches of water content, the least measured there since the record began in 1989.

For more information, contact your Natural Resources Conservation Service office in Anchorage, 271-2424.

APPENDIX III

Pellet-Group Densities Reported by Transect and Elevation

Table 2. Mean pellet-group density by VCU, by transect, Spring 1996.

	PELLET-GROUPS PER PLOT	
	MEAN	NO. OF PLOTS
VCU 35 - N. DOUGLAS		
TRANSECT		
1	0.93	83
2	0.88	125
3	1.09	115
VCU 36 - INNER POINT		
TRANSECT		
1	1.31	65
2	1.92	100
3	1.68	75
VCU 128 - HAWK INLET		
TRANSECT		
1	0.88	106
2	1.47	94
3	1.43	125
VCU 202 - PORT FREDERICK		
TRANSECT		
1	1.70	82
3	0.19	53
4	0.17	23
5	1.15	68
VCU 209 - SUNTAHEEN		
TRANSECT		
1	0.72	125
2	0.61	75
3	1.76	76
VCU 218 - PAVLOF RIVER		
TRANSECT		
1	1.28	125
2	1.16	117
3	2.12	107
VCU 223 - UPPER TENAKEE		
TRANSECT		
1	1.07	71
2	0.16	97
3	0.59	95
VCU 231 - SALTERY BAY		
TRANSECT		
1	3.04	71
2	0.05	20
3	1.18	61
VCU 235 - KADASHAN		
TRANSECT		
1	2.98	61
2	2.52	48
3	1.87	95
VCU 247 - FINGER MOUNTAIN		
TRANSECT		
1	2.09	67
2	2.84	101
3	2.87	53

Table 2. Continued.

	PELLET-GROUPS PER PLOT	
	MEAN	NO. OF PLOTS
VCU 300 - NAKWASINA		
TRANSECT		
2	3.35	49
3	2.16	75
8	3.09	86
VCU 305 - KALININ BAY		
TRANSECT		
1	1.37	70
2	1.77	102
3	1.68	53
VCU 361 - KNIGHT ISLAND		
TRANSECT		
1	0.00	90
2	0.00	63
VCU 368 - YAKUTAT ISLANDS		
TRANSECT		
1	1.12	135
2	0.32	135
3	0.27	109
VCU 417 - CONCLUSION ISLAND		
TRANSECT		
1	1.23	71
2	1.24	50
3	1.81	70
VCU 448 - WOEWODSKI		
TRANSECT		
1	2.59	85
2	2.08	85
3	2.05	73
VCU 489 - MUDDY RIVER		
TRANSECT		
1	3.06	108
2	1.04	120
4	0.63	120
VCU 532 - RED BAY		
TRANSECT		
1	1.27	104
2	0.63	71
3	1.48	106
VCU 549 - SARHEEN		
TRANSECT		
1	1.12	109
2	0.98	125
3	0.88	100
VCU 561 - WARM CHUCK		
TRANSECT		
1	1.89	118
2	0.91	100
3	1.21	58
VCU 748 - GEORGE INLET		
TRANSECT		
1	1.27	55
2	1.19	125
3	0.63	125

Table 2. Continued.

	PELLET-GROUPS PER PLOT	
	MEAN	NO. OF PLOTS
VCU 765 - DALL HEAD		
TRANSECT		
1	1.10	105
2	0.95	100
3	1.18	90
VCU 767 - DUKE ISLAND		
TRANSECT		
1	0.06	95
2	0.07	105
3	0.02	94
VCU 769 - ALAVA BAY		
TRANSECT		
1	0.76	125
2	0.91	100
3	1.17	99
VCU 999 - GRAVINA ISLAND		
TRANSECT		
1	1.33	120
2	1.58	104
3	1.53	114

Table 3. Mean pellet-group density by VCU, by elevation, Spring 1996.

	PELLET-GROUPS PER PLOT	
	MEAN	NO. OF PLOTS
VCU 35 - N. DOUGLAS		
0-500 FT.....	0.61	114
501-1000 FT.....	1.11	147
1001-1500 FT.....	1.29	62
VCU 36 - INNER POINT		
0-500 FT.....	1.57	163
501-1000 FT.....	1.67	39
1001-1500 FT.....	2.16	38
VCU 128 - HAWK INLET		
0-500 FT.....	1.27	115
501-1000 FT.....	1.38	153
1001-1500 FT.....	0.93	57
VCU 202 - PORT FREDERICK		
0-500 FT.....	1.12	143
501-1000 FT.....	0.93	58
1001-1500 FT.....	0.68	25
VCU 209 - SUNTAHEEN		
0-500 FT.....	0.96	217
501-1000 FT.....	0.95	42
1001-1500 FT.....	1.24	17
VCU 218 - PAVLOF RIVER		
0-500 FT.....	1.34	298
501-1000 FT.....	2.57	21
1001-1500 FT.....	2.37	30
VCU 223 - UPPER TENAKEE		
0-500 FT.....	0.67	203
501-1000 FT.....	0.19	47
1001-1500 FT.....	0.31	13
VCU 231 - SALTERY BAY		
0-500 FT.....	2.14	97
501-1000 FT.....	1.31	39
1001-1500 FT.....	1.88	16
VCU 235 - KADASHAN		
0-500 FT.....	2.38	143
501-1000 FT.....	2.48	29
1001-1500 FT.....	2.16	32
VCU 247 - FINGER MOUNTAIN		
0-500 FT.....	2.87	143
501-1000 FT.....	2.94	48
1001-1500 FT.....	0.93	30
VCU 300 - NAKWASINA		
0-500 FT.....	2.83	102
501-1000 FT.....	2.54	50
1001-1500 FT.....	3.03	58
VCU 305 - KALININ BAY		
0-500 FT.....	1.71	103
501-1000 FT.....	1.47	72
1001-1500 FT.....	1.68	50
VCU 361 - KNIGHT ISLAND		
0-500 FT.....	0.00	136
501-1000 FT.....	0.00	17

Table 3. Continued.

	PELLET-GROUPS PER PLOT	
	MEAN	NO. OF PLOTS
VCU 368 - YAKUTAT ISLANDS		
0-500 FT.....	0.59	379
VCU 417 - CONCLUSION ISLAND		
0-500 FT.....	1.18	130
501-1000 FT.....	2.02	61
VCU 448 - WOEWODSKI		
0-500 FT.....	1.35	71
501-1000 FT.....	2.05	57
1001-1500 FT.....	2.90	115
VCU 489 - MUDDY RIVER		
0-500 FT.....	1.53	348
VCU 532 - RED BAY		
0-500 FT.....	0.85	204
501-1000 FT.....	2.00	61
1001-1500 FT.....	2.44	16
VCU 549 - SARHEEN		
0-500 FT.....	1.02	278
501-1000 FT.....	0.88	56
VCU 561 - WARM CHUCK		
0-500 FT.....	1.43	214
501-1000 FT.....	1.11	47
1001-1500 FT.....	2.40	15
VCU 748 - GEORGE INLET		
0-500 FT.....	0.74	175
501-1000 FT.....	1.07	112
1001-1500 FT.....	2.67	18
VCU 765 - DALL HEAD		
0-500 FT.....	1.14	269
501-1000 FT.....	0.27	22
1001-1500 FT.....	0.75	4
VCU 767 - DUKE ISLAND		
0-500 FT.....	0.05	294
VCU 769 - ALAVA BAY		
0-500 FT.....	0.78	237
501-1000 FT.....	1.39	72
1001-1500 FT.....	1.07	15
VCU 999 - GRAVINA ISLAND		
0-500 FT.....	1.67	164
501-1000 FT.....	1.52	84
1001-1500 FT.....	1.06	90