1989 Report

Deer Pellet-Group Surveys in Southeast Alaska

by

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PREFACE

This report summarizes the deer pellet group survey work conducted by the Alaska Department of Fish and Game and the United States Forest Service in Southeast Alaska during 1989. It is intended as an addendum to the Pellet Group Survey Reports for 1981-1988, where one can find the objectives, methods, and discussion for this project.

During 1989, 32 watersheds (or value comparison units - VCU's), were surveyed. For each VCU, transect locations, physiographic information, deer population density, and trend are described. Overall, deer pellet group densities were down about 20% in northern Southeast Alaska, were unchanged in central Southeast Alaska, and increased about 20% in southern Southeast Alaska. Complete results can be found in Table 1 at the end of the narratives.

NARRATIVES

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 wind and sea conditions in Stephens Passage. Pellet group densities measured since 1985 have all been moderate (1 to 2 pellet groups per plot).

Sumdum Glacier (VCU 65) - This VCU is located at the mouth of Endicott Arm and comprises Harbor Island, Sumdum Island, and a portion of the mainland. Deer hunters have reported seeing deer on Harbor Island and a survey was conducted in 1987 to see how many might be out there. A rough estimate of 60 was derived from pellet group data. No deer presence was recorded on the mainland, and Sumdum Island wasn't sampled because of rough seas. In 1989, Fish and Game crews returned to this VCU to see if deer were present on Sumdum Island. Three people walked around the east end of the island for over 30 minutes and no signs of deer were found.

Negro Creek (VCU 82) - Three new transects were established at Negro Creek in Port Houghton in 1989. Deer are relatively rare in Unit 1B, but reports had been received from hunters that deer had been seen on the beach in the vicinity of Roberts Island. These transects were intended to assess the population. Transect #1 was located on Roberts Island and was brushy with mid-volume timber. Transects #2 and #3 were located on the mainland and described as boggy, low-volume, and "relentlessly brushy." Overall, deer pellet group densities were low (less than 1 pellet group per plot), with the highest pellet group counts coming from the island. It would be interesting to see what kind of pellet-group counts were obtained from the Fanshaw Range, 3 miles to the SW, where the timber volume, elevation, and exposure are all different. It appears the Fanshaw Range would provide much better winter habitat for deer than Negro Creek.

This VCU should probably be sampled every five to ten years to monitor trend.

Shelter Island (VCU 124) - Located north of Juneau in lower Lynn Canal, this VCU is composed of Shelter and Lincoln islands and is a popular destination for Juneau hunters. Shelter Island, the larger of the two, is primarily forested, while Lincoln Island contains more muskeg. The maximum elevation is 1,170 feet on the northern end of Shelter Island. This VCU was intensively sampled from 1984 through 1986 with an average of 738 plots, but this practice was discontinued because most of the south end of the island is private property. In 1987, only Transects 4,5,6,7,8, and 18 on the north end of the island were sampled. These six transects are the easiest to access and can all be done in one day with a six-person crew. Some of the transect starting points are hard to see from a skiff, but they can be located by crews walking along the shore. Pellet group densites on Shelter Island have traditionally been high (over 2 pellet groups per plot), but 1989 showed a drastic decline. The low number may be due to the unusually late date these transects were run in 1989. Sampling was performed on May 24 and there was advanced leaf-out limiting visibility of pellet groups. The 1990 survey on Shelter Island should help answer the question of whether deer populations are actually down or not.

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 almost continuously since 1982. Access to Hawk Inlet is easy from Juneau by either plane or large vessel. In 1989, the bearings of Transects #1 and #2 were altered slightly to make sampling easier, (i.e., avoid cliffs). Transect #1 was switched from 325 degrees to 322 degrees, and Transect #2 was altered from 270 degrees to 264 degrees. Data collected at Hawk Inlet in 1989 indicated that deer populations have fallen to moderate levels, perhaps as a result of the severe winter of 1988. This VCU will continue to be sampled regularly.

Thayer Lake (VCU 162) - This VCU, in the interior of Admiralty Island, was first sampled in 1987. Six, 50-plot transects were laid out around the lake with different exposures. A.D.F.&G. wanted to see to what extent deer used this forested "inland" area for winter range. (In the past, most deer winter range has been considered to be along coastal areas.) Deer pellet group densities in 1987 were high. In 1989, Thayer Lake was re-examined to see how the winter of 1988 affected the population. Pellet group means were lower - 2.81 in 1987 and 2.04 in 1989.

Hood Bay (VCU 171) - Three transects were established at Hood Bay, on the SW coast of Admiralty Island, in 1987. Hood Bay is an important deer hunting area for the residents of nearby Angoon. Transects #1 and #2 sample south-facing slopes to 1500 feet elevation. Transect #3 samples riparian habitat in the south arm of Hood Bay and contains one of the finest stands of big spruce trees in Southeast Alaska. Deer pellet group densities in Hood Bay were down in 1989 compared to 1987, a trend similar to to most other Admiralty Island locations.

Pybus Bay (VCU 182) - Pybus Bay, on the SE coast of Admiralty Island, is an important deer hunting area for Juneau, Petersburg, and Kake residents, and has been surveyed regularly since 1981. All 3 transects are fairly easy, although snow can sometimes be a

problem at higher elevations. The last three years this VCU has been surveyed (1986, 1987, and 1989), pellet group densities have been the same - 2.0 pellet groups per plot. A 1990 survey could be extremely valuable in determining how the 1988-89 winter affected deer populations.

Finger Mt. (VCU 247) - The Finger River drainage, in lower Hoonah Sound, has consistently exhibited some of the highest deer pellet densities in all of Southeast. Three transects were established here in 1983, and they have been surveyed almost every year since. Transect #1 is a nice hike to a 1100-foot knob, then it undulates up and down from there. Persistent snow is sometimes a problem on this transect. Transect #2 parallels the Finger River, has lots of deer sign, and the walk back along the river is delightful. Transect #3 is short and steep to 1500 feet elevation. Deer pellet group densities in Finger River remained high in 1989.

Nakwasina (VCU 300) - If there is such a thing as a perfect VCU to sample, then this one's it. Access is easy by skiff from Sitka, and all three transects are easy to walk with fine views at the end. Nakwasina was originally sampled in 1984 with 12 transects. Afterwards, the best three were picked out, and those are the ones we continue to survey today (#'s 2,3, and 8). In 1989, deer pellet group densities remained steady and high, although there is some concern that the vegetation may be overbrowsed.

Sealion Cove (VCU 305) - Three transects were established at Kalinin Bay on the north end of Kruzof Island in 1984. They have been run just about every year since. Transects #1 and #3 on the east side of the bay are relatively short and steep and reach alpine quickly. Transect #2 at the head of the bay is longer and aims for a 1500-foot knob to the SW. Timber volume on all 3 transects is moderate and the views at the top are spectacular. 1989 pellet group data shows a fairly substantial decline in deer populations in Kalinin Bay. The blueberry observed was severely browsed, more so than any other location in Southeast, and the winter of 1988-89 could have caused high mortality. This VCU will be examined again in 1990 to see what kind of trend is developing.

Redoubt Bay (VCU 321) - Three new transects were established at Redoubt Bay in 1989. These transects, 10 miles south of Sitka, are in an area which receives heavy hunting use from locals. It is also a VCU that has been logged. Transect #1 followed a steep southerly slope adjacent to a clearcut near Kidney Cove; #2 started at the mouth of Kizhuchia Creek and ran along an east-west ridge (there was some blowdown and steep rock faces); and #3 started 1/2 mile west of the creek mouth and traveled through mostly muskeg and non-commercial forest. The three transects showed deer populations in Redoubt Bay to be high. Due to the difficult terrain experienced on Transects #1 and #2, it is not recommended that this VCU be regularly surveyed.

West Crawfish (VCU 348) - In 1989 3 new transects were established in West Crawfish Inlet on the west coast of Baranof Island. Prior to this year no surveys had been made south of Sitka on the outside coast, and A.D.F.&G. biologists wanted to examine the area. West Crawfish Inlet was chosen because it is protected from the high seas of the open ocean and there appeared to be good terrain to travel from topographical maps.

Transect #1 started at Cedar Pass and ran NW through mostly muskeg and non-commercial forest. Transect #2 ran up a south-facing ridge that was up and down and fell off sharply on both sides. Transect #3 started in Shamrock Bay and ran west - the line was brushy and side-hill all the way. There is not much commercial forest in this VCU, only 16%, and perhaps that accounted for the only moderate deer pellet group densities observed.

Security Bay (VCU 400) - Three transects were established at Security Bay, on northern Kuiu Island, in 1984. Deer pellet group densities observed were lower than any other VCU surveyed in Southeast Alaska. In 1989, this VCU was visited again to see if deer populations had improved any. Transects #1 and #2 had their bearings slightly altered to better follow the lay of the land. Transect #1 started in Band Cove and followed a ridge through good volume timber. Transect #2 started at Pt. Lookout and went up a very steep hill. Transect #3 started at the mouth of the bay and ran east through heavy brush at the start - then into an open cedar forest. An active logging operation was proceeding close by to the south. 1989 Deer pellet group density was still very low in Security Bay, but much improved from 1984.

Conclusion Island (VCU 417) - Three transects were established at Conclusion Island in Sumner Strait in 1987. The island is an important subsistance hunting area for the residents of Port Protection and Point Baker, and the Department was responding to these resident's concerns that deer populations might be falling on the island. In 1987, deer pellet group densities indicated that deer populations were high on this heavily-wooded island. In 1989, the Department again surveyed Conclusion Island, and found that deer pellet group densities were much reduced. The vegetation did not look overbrowsed, indicating that some other factor may be altering populations. The Department will continue to monitor Conclusion Island for future trends.

Rocky Pass (VCU 428) - Rocky Pass is a narrow water passage that separates Kuiu Island from Kupreanof Island. Three new transects were established here in 1989. Transect #1 goes up to a 700-foot knob on Kuiu Island. The beginning is very brushy with vegetation up to six feet high. Timber volume is moderate. Transect #2 starts on the east side of High Island (in the middle of Rocky Pass) and goes through extensive second-growth. Transect #3 travels through low volume, low-elevation, mostly non-commercial forest on Kupreanof Island. Overall, the deer sign in this VCU was very low; with absolutely no sign at all on Kupreanof. This VCU should occasionally be resurveyed to monitor trend.

Big Level Island (VCU 434a) - Seven transects were established on Big Level Island in Sumner Strait in 1981. The island has been extensively logged, and the Forest Service has initiated a pre-commercial thinning program. There is an abundance of slash on the ground making walking both difficult and dangerous. In 1989, Transects #3,4,6, and 7 were run (manpower was not available to do the other three). Deer pellet group densities were down. The Department plans on surveying Big Level Island every 3-4 years to continue monitoring trend.

Little Level Island (VCU 434b) - Five transects were established on Little Level Island in Sumner Strait in 1981. All five were again surveyed in 1983, 1986, and 1989. The pellet group density trend is downward. This might be expected on an island that was almost entirely clearcut in the 1960s and 1970s. The Department plans on surveying Little Level Island every 3-4 years to continue monitoring trend.

Castle River (VCU 435) - Castle River VCU, located in Duncan Canal on Kupreanof Island, was first sampled in 1984, and again in 1987 and 1989. One transect is located on Big Castle Island, and the other two are located on Kupreanof Island. Pellet group densities remain very low, especially along the Castle River transect, where not a single pellet group was found.

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. In 1988, a fourth and fifth transect were added; #4 on Woewodski Island and #5 near Woodpecker Cove on Mitkof Island. In 1989, all five transects were run; deer pellet group densities remain moderate and stable.

Woronkofski (VCU 461) - This island VCU, located near Wrangell, was selected as an intensive sampling area in 1985. Because persistant snow was a problem, only the three south-facing transects were surveyed in 1987 and 1989 (Transects 10,11, and 12). Timber volume on these transects is impressive even at higher elevations. Deer pellet group densities were high in 1989 and are part of an increasing trend, good news for Wrangell hunters.

Sarheen (VCU 549) - Three new transects were located at Sarheen on the NW coast of Prince of Wales Island in 1989. Sarheen was selected because it is unlogged, protected from rough seas, and there were numerous reports of hunter success here. Fish and Game crews established three transects that traverse mostly low-volume timber. 1989 pellet group densities were moderate.

Warm Chuck (VCU 561) - Located on Heceta Island off the west coast of Prince of Wales Island, this VCU is a popular hunting destination. Three transects were established here in 1984; deer pellet group densities were moderate. Sampling was also conducted in 1985 and 1989, and the trend is upward, with deer pellet group densities now rated as high. Each of the three transects is brushy with some blowdown; part of Transect #1 has been logged since 1984, and Transect #3 has some problems with cliffs. Access to this VCU by floatplane from Ketchikan is expensive; this VCU should probably continue to be sampled by a large vessel as the opportunity arises.

Coronation (VCU 564) - Pellet group surveys were conducted on Coronation Island in 1983 and 1985 by personnel from the Petersburg area office. Pellet group densities ranged from low (0.78 in 1983) to high (2.43 in 1985). In 1988, four transects were permanently established that all start at Egg Harbor, the best anchorage on the island. (In the past, transects had started all over the island.) Pellet group densities were moderate.

In 1989, Coronation Island was sampled by two students living on the island and pellet group densities were again moderate. When Coronation Island is surveyed again it should be done during calm weather; wind and sea conditions can make skiff travel dangerous.

Snakey Lakes (VCU 578) - This interior VCU, in the Thorne River drainage, is located in the central portion of Prince of Wales Island. The Forest Service established 3 transects here in 1986. Two of these three transects were again run in 1989; pellet group densities were moderate.

12 Mile (VCU 635) - This VCU, located near Kasaan Bay on Prince of Wales Island, has been sampled by the Forest Service every year since 1985. Pellet group densities remain low.

Port Refugio (VCU 635) - This VCU is located on Suemez Island off the west coast of Prince of Wales Island. The Forest Service has conducted pellet group counts here every year since 1985. Pellet group densities were high during 1985 and 1986, but decreased significantly in 1987. In 1988, they were lower still, and in 1989, even lower. Sampling should be continued at Port Refugio to monitor this downward trend. There is an active logging operation on Suemez Island and Transect #1 has to traverse several recent clearcut units; Transect #2 is mostly brushy and non-commercial cedar; and Transect #3 travels through moderate timber volume and has a nice muskeg at the top. In 1989, as part of a sampling test, Suemez Island was visited twice, once by A.D.F.&G and once by the Forest Service. We wanted to see how close the results would be covering the same transects in the same year. Pellet group densities were similar - .96 pellet groups per plot by the Forest Service and .88 pellet groups per plot by Fish and Game.

Kitkun Bay (VCU 679) - Three transects were established in Kitkun Bay on the east coast of Prince of Wales Island in 1988. The transects ran through some very high volume stands, particularly on Transect #1, where trees were already marked for felling. Pellet group densities were low. In 1989, Kitkun Bay was revisited, and pellet group densities were still low.

Margaret (VCU 738) - This VCU, in the Traitors Cove area on northern Revilla Island, was first sampled by the Forest Service in 1985. Pellet group densities were low. In 1986, the Forest Service again surveyed the VCU and observed a slight increase in pellet group densities. The VCU was also surveyed in 1988 and 1989, but the number of sample plots was too small to be conclusive. In the future, an effort should be made to sample at least 300 plots to gain statistically reliable data.

George Inlet (VCU 748) - This VCU is accessible by skiff from Ketchikan. Sampling has been conducted in 1981, 1984, 1985, and 1989. The trend has been increasing, with deer pellet group density currently at moderate levels. (1989 data might be skewed to the high side because only 169 plots were sampled instead of 300). This VCU will be sampled again in 1990.

Wasp Cove (VCU 772) - This VCU on southeastern Revilla Island has been sampled by the Forest Service in 1985, 1986, and 1989. Pellet group densities are currently low. In the future, an effort should be made to sample at least 300 plots to insure greater statistical reliability.

Gravina (VCU 999) - Northeastern Gravina Island was first sampled in 1981 and again in 1984, 1985, and 1986. Starting in 1987, sampling was reduced to three transects (#'s 1, 2, and 3). All are easily accessible via the Ketchikan airport ferry, and all are similar in terrain, timber volume, and elevation. In 1989, pellet group densities fell sharply from 2.06 to 1.13 pellet groups per plot. This could be due to increased wolf and black bear predation, severe winters, or a statistical error (only 182 plots were sampled). In 1990, Gravina Island will be sampled again to determine trend.

Table 1. Pellet-group count statistics from southeast Alaska, 1981-89.

VCU	Name	Land acres	% CFL	Year	N	Pellet Group Mean	95% CI	K
27	Auke Bay	15,245	45%	1987	381	0.99	0.87-1.12	1.66
36	Inner Point	3,965	44%	1985	256	1.30	1.10-1.51	1.09
				86	235	1.97	1.68-2.25	1.29
				87	262	1.76	1.53-2.00	1.61
				88	200	1.21	1.02-1.39	2.27
				89	**258**	**1.31**	**1.08-1.53**	**.86**
65	Sumdum Glacier	40,906	15%	1987	262	1.76	1.53-2.00	1.61
82	Negro Creek	12,212	31%	**1989**	**312**	**0.21**	**0.13-0.29**	**0.17**
124	Shelter Island (all transects)	6,162	43%	1984	713	1.46	1.33-1.60	1.80
				85	774	1.82	1.67-1.97	1.24
				86	727	2.20	2.02-2.37	1.28
124	Shelter Island (Trans. 4-8, 18)			1984	300	1.52	1.34-1.70	2.07
				85	296	2.52	2.24-2.81	1.78
				86	292	3.24	2.91-3.57	2.10
				87	288	2.91	2.57-3.24	1.49
				88	130	3.16	2.62-3.70	1.33
				89	**300**	**1.43**	**1.23-1.62**	**1.37**
125	Barlow Cove	13,712	24%	1982	2,567	1.07	1.01-1.12	0.75
				84	347	1.69	1.46-1.92	0.98
				85	347	1.55	1.35-1.76	1.05
127	Calm Station	4,941	66%	1982	1,054	1.65	1.53-1.77	1.30
128	Hawk Inlet	14,318	57%	1982	1,605	1.21	0.99-1.42	0.67
				84	339	1.42	1.22-1.63	0.96
				85	270	1.69	1.43-1.95	0.91
				86	286	1.92	1.64-2.19	1.00
				87	278	2.54	2.19-2.89	1.04
				89	**364**	**1.82**	**1.56-2.08**	**0.83**
140	Dorn Island	9,485	81%	1984	230	1.27	1.02-1.53	0.69
148	Lake Kathleen	14,693	57%	1987	207	2.13	1.76-2.49	0.91
150	Lake Florence	21,342	52%	1988	294	1.48	1.27-1.69	1.19
162	Thayer Lake	25,342	79%	1987	313	2.81	2.49-3.12	1.53
				89	**283**	**2.04**	**1.75-2.32**	**1.09**
171	Hood Bay	44,355	79%	1987	358	2.31	1.99-2.63	0.76
				89	**366**	**1.77**	**1.54-2.00**	**0.92**

VCU	Name	Land acres	% CFL	Year	N	Pellet Group Mean	95% CI	K
182	Pybus Bay	41,501	62%	1981	390	1.34	1.16-1.52	0.93
				84	300	1.02	0.86-1.18	1.18
				85	269	1.86	1.60-2.12	1.22
				86	235	2.00	1.70-2.29	1.19
				87	242	2.03	1.69-2.37	0.78
				89	**199**	**2.00**	**1.63-2.36**	**0.81**
189	Port Althorp	8,040	27%	1988	195	1.80	1.47-2.13	0.87
190	Idaho Inlet	53,183	22%	1988	258	1.34	1.09-1.60	0.60
202	Port Frederick	16,619	52%	1988	242	1.87	1.62-2.13	1.50
208	First No. 2	6,613	32%	1983	1,155	1.12	1.01-1.22	0.63
209	Suntaheen Cr.	13,198	49%	1988	272	1.22	1.00-1.44	0.69
211	Point Augusta	4,688	63%	1983	757	1.78	1.62-2.01	1.08
218	Pavlof River	18,866	50%	1988	325	1.78	1.50-2.06	0.67
221	Whip Station	4,708	53%	1981	193	0.86	0.64-1.08	0.47
222	Sand Station	12,231	50%	1981	253	0.60	0.48-0.73	0.80
223	Upper Tenakee.	3,833	54%	1988	253	1.47	1.24-1.70	1.04
231	Saltery Bay	18,478	31%	1988	256	2.02	1.69-2.35	0.99
234	Inbetween	6,002	62%	1981	35	0.49	0.08-0.89	0.23
235	Kadashan	33,641	53%	1981	96	0.54	0.32-0.76	0.43
				88	221	2.67	2.18-3.16	0.65
236	Corner Bay	10,930	66%	1981	60	0.35	0.17-0.53	0.73
246	Broad Island	17,145	38%	1981	209	1.41	1.18-1.63	1.39
247	Finger Mt.	15,918	38%	1983	2,145	1.17	1.11-1.24	1.09
				84	302	1.83	1.57-2.09	1.02
				85	279	3.23	2.79-3.67	0.96
				86	277	2.88	2.57-3.19	2.13
				87	236	3.11	2.71-3.52	1.35
				89	**305**	**2.99**	**2.57-3.40**	**0.85**
249	Lisianski	19,677	24%	1988	255	0.97	0.79-1.14	0.88
254	Soapstone	17,695	29%	1988	274	1.92	1.67-2.17	1.44

VCU	Name	Land acres	% CFL	Year	N	Pellet Group Mean	95% CI	K
275	Cobol	14,618	49%	1984	224	1.15	0.92-1.37	0.78
279	Rapids Point	7,637	65%	1983	2,734	0.77	0.73-0.81	1.34
281	Ushk Bay	20,770	38%	1981	94	0.63	0.41-0.85	0.71
288	Range Creek	6,929	33%	1983	1,788	0.51	0.46-0.55	0.60
				84	303	0.71	0.61-0.92	0.60
				85	224	1.32	1.02-1.62	0.44
295	Lake Eva	12,362	65%	1987	172	1.81	1.46-2.15	0.94
296	Portage Arm	16,101	59%	1981	213	0.53	0.39-0.68	0.50
300	Nakwasina (all transects)	19,575	48%	1984	196	2.51	2.14-2.88	1.48
				85	1046	3.92	3.67-4.17	1.18
				86	715	3.50	3.26-3.76	1.15
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**	**1.19**
305	Sealion Cove	9,293	69%	1984	320	1.36	1.15-1.58	0.77
				85	292	2.57	2.23-2.91	1.06
				86	235	2.87	2.44-3.29	1.01
				87	226	3.31	2.82-3.80	1.00
				89	**303**	**1.75**	**1.50-2.00**	**0.98**
321	Redoubt Bay	9,045	58%	**1989**	**304**	**2.17**	**1.88-2.47**	**1.00**
348	West Crawfish	57,434	16%	**1989**	**360**	**1.35**	**1.36-1.57**	**0.60**
339	Cape Ommaney	13,725	32%	1988	172	1.74	1.43-2.05	0.82
400	Security	28,040	79%	1984	360	0.02	0.01-0.04	
				89	**304**	**0.25**	**0.16-0.34**	**0.16**
403	Pillar Bay	28,227	65%	1988	337	0.16	0.10-0.22	0.15
417	Conclusion Is.	12,561	99%	1987	207	2.66	2.32-3.01	1.93
				89	**200**	**0.95**	**0.72-1.18**	**0.51**
428	Rocky Pass	49,403	35%	**1989**	**2987**	**0.40**	**0.27-0.53**	**0.45**
431	Pt. Barrie	22,187	27%	1988	357	0.23	0.17-0.29	0.42

VCU	Name	Land acres	% CFL	Year	Pellet Group N	Mean	95% CI	K
434a	Big Level Is.	727	61%	1981	399	1.54	1.45-1.63	
				83	336	1.56		
				86	382	1.66	1.41-1.90	0.66
				89	**227**	**1.07**		
434b	Little Level	263	92	1981	114	2.48	2.02-2.94	
				83	136	2.34		
				86	122	1.39	1.07-1.70	1.12
				89	**137**	**1.52**		
435	Castle River	32,724	36%	1984	312	0.19	0.12-0.26	0.20
				87	305	0.51	0.37-0.65	0.34
				89	**312**	**0.40**	**0.25-0.56**	**0.21**
448	Woewodski	20,931	53%	1984	295	0.88	0.69-1.08	0.43
				85	209	1.00	0.82-1.19	1.13
				87	195	1.65	1.85-2.61	0.94
	(Trans. 1-5)			88	433	1.33	1.16-1.51	0.82
				89	**417**	**1.35**	**1.24-1.73**	**0.60**
449	Frederick	6,835	70%	1981	945	0.08	0.06-0.11	0.09
454	Dry	11,033	74%	1981	91	0.92	0.56-1.28	0.80
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	
461	Woronkofski (all transects)	14,500	63%	1985	646	1.63	1.45-1.81	0.70
461	Woronkofski			1985	218	2.01	1.62-2.39	0.77
	(Trans. 10,11,12)			87	201	2.23	1.85-2.61	0.94
				89	**223**	**2.52**	**2.18-2.85**	**1.52**
473	Onslow	28,947	55%	1984	321	0.37	0.28-0.46	0.45
				85	334	0.59	0.48-0.70	0.71
				86	347	0.72	0.59-0.84	0.90
				87	336	0.42	0.31-0.55	0.35
				88	329	0.44	0.32-0.55	0.28
528	Mt. Calder	9,232	83%	1988	252	2.14	1.78-2.49	0.73
532	Red Bay	15,145	66%	1987	177	0.32	0.18-0.47	0.22
539	Exchange Cove	10,406	74%	1988	266	1.39	1.15-1.64	0.68
554	Sarkar	32,183	60%	1988	298	1.28	1.06-1.50	0.65

VCU	Name	Land acres	% CFL	Year	Pellet Group N	Pellet Group Mean	Pellet Group 95% CI	K
549	Sarheen	11,875	52%	**1989**	**310**	**1.73**	**1.44-2.01**	**0.62**
561	Warm Chuck	12,348	85%	1984	326	1.02	1.02-1.38	1.01
				85	295	1.60	1.36-1.84	0.90
				89	**302**	**2.21**	**1.91-2.50**	**1.02**
564	Coronation	19,107	69%	1983	696	1.20	1.04-1.36	0.45
				85	228	2.34		
	(4 transects)			88	408	1.41	1.17-1.66	0.39
				89	**293**	**1.63**	**1.28-1.98**	**0.35**
578	Snakey Lakes	6,431	84%	1986	279	0.62	0.51-0.73	1.39
				88	300	1.05	0.84-1.26	0.48
				89	**200**	**1.56**	**1.26-1.86**	**0.76**
581	Luck Lake	19,818	67%	1986	178	1.74	1.41-2.07	0.88
				88	300	2.11	1.80-2.41	0.84
587	Tuxekan	12,129	77%	1988	300	1.06	0.84-1.28	0.42
621	12 Mile	23,344	59%	1985	196	0.31	0.19-0.43	0.26
				86	300	0.64	0.48-0.81	0.28
				87	370	0.65	0.49-0.81	0.24
				88	302	0.62	0.46-0.77	0.28
				89	**235**	**0.78**	**0.59-0.98**	**0.38**
635	Port Refugio	9,118	50%	1985	317	2.69	2.27-3.12	0.59
				86	324	2.52	2.09-2.96	0.47
				87	369	1.76	1.46-2.07	0.44
	(Trans.1,2)			88	270	1.15	0.90-1.40	0.40
				89	~~307~~ 672	~~0.80~~ 0.92	**0.68-0.93**	**0.50**
679	Kitkun Bay	15,359	75%	1988	240	0.31	0.20-0.42	0.22
				89	**273**	**0.89**	**0.71-1.07**	**0.58**
685	Nutkwa	17,079	73%	1988	234	0.09	0.02-0.16	0.08
716	Helm Bay	16,127	57%	1981	704	0.16	0.12-0.19	0.31
				84	302	0.54	0.44-0.65	1.18
				85	181	0.85	0.65-1.05	0.70
				88	247	1.66	1.38-1.95	0.78
738	Margaret	19.286	67%	1985	515	0.57	0.47-0.66	0.56
				86	251	0.84	0.69-1.00	1.07
	(Trans. 10,11)			88	110	1.31	0.96-1.67	0.77
				89	**129**	**0.62**	**0.44-0.80**	**0.74**

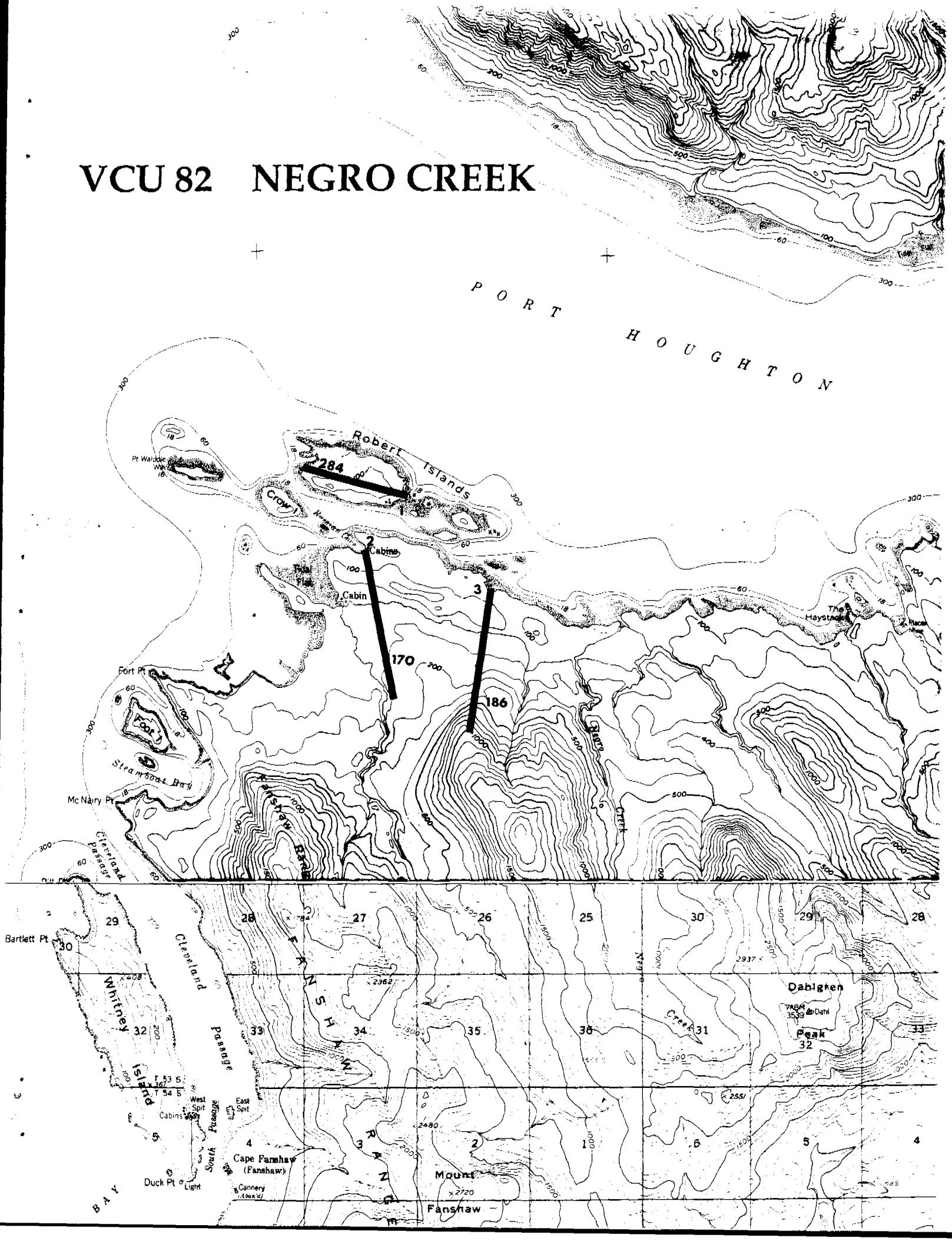
VCU	Name	Land acres	% CFL	Year	N	Pellet Group Mean	95% CI	K
748	George Inlet	19,448	28%	1981	110	0.21	0.09-0.33	0.21
				84	344	0.27	0.19-0.35	0.28
				85	313	0.52	0.39-0.65	0.37
				89	**169**	**1.41**	**1.08-1.75**	**0.56**
752	Whitman Lake	6,015	38%	1981	45	0.18	0.02-0.33	0.33
				87	187	0.16	0.09-0.23	0.47
758	Carroll Pt.	11,629	34%	1985	118	0.66	0.46-0.86	0.82
				86	118	0.75	0.56-0.95	1.33
	(Trans. 28)			88	85	1.15	0.81-1.48	1.00
759	Moth Bay	7,652	23%	1985	140	0.59	0.42-0.74	0.99
				86	156	0.98	0.79-1.17	1.79
	(Trans. 3)			88	78	0.71	0.46-0.97	0.84
760	Lucky Cove	12,377	43%	1985	335	1.16	1.00-1.33	1.11
				86	258	1.16	0.95-1.32	1.25
	(Trans. 5)			88	65	1.01	0.68-1.34	1.25
764	Blank Inlet	3,640	19%	1981	108	1.24	0.89-1.59	0.70
765	Dall Head	4,803	63%	1981	69	0.52	0.31-0.74	0.91
769	Alava Bay	13,563	60%	1985	311	0.52	0.39-0.65	0.30
				86	326	0.85	0.68-1.01	0.49
772	Wasp Cove	4,882	90%	1985	271	0.41	0.31-0.51	0.52
				86	300	0.50	0.38-0.62	0.41
				89	**145**	**0.58**	**0.39-0.77**	**0.42**
999	Gravina			1981	226	1.06	0.89-1.22	1.93
	(all transects)			84	1,087	0.86	0.78-0.94	0.84
				85	1,172	1.23	1.13-1.32	1.09
				86	1,267	1.40	1.30-1.50	1.08
999	Gravina			1984	376	0.88	0.73-1.03	0.65
	(Trans. 1,2,3)			85	224	1.44	1.20-1.67	1.20
				86	346	1.62	1.43-1.81	1.60
				87	334	1.63	1.41-1.84	1.13
				88	278	2.06	1.78-2.35	1.16
				89	**182**	**1.13**	**0.86-1.41**	**0.53**

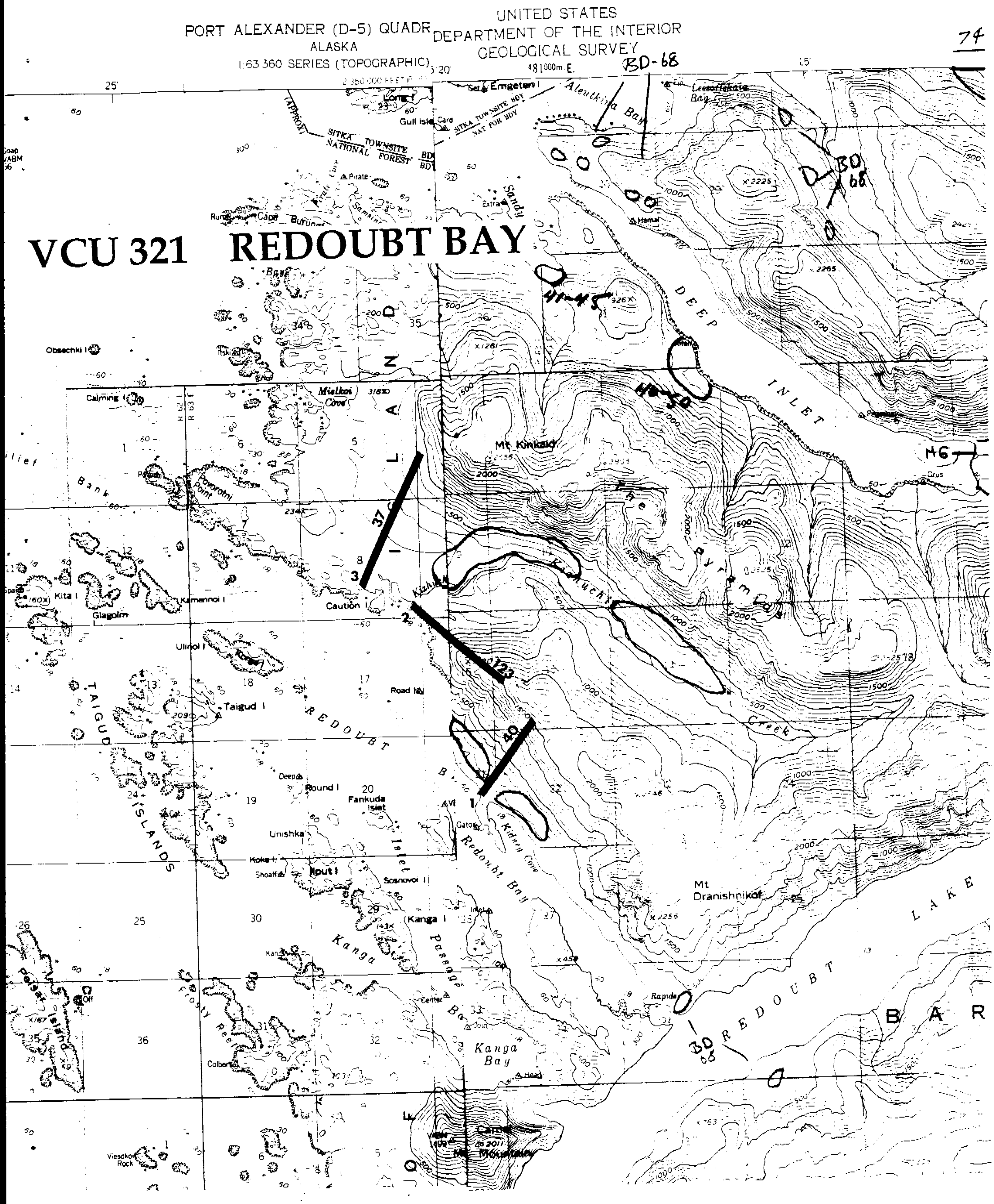
APPENDIX I

New VCUs Sampled in 1989[a]

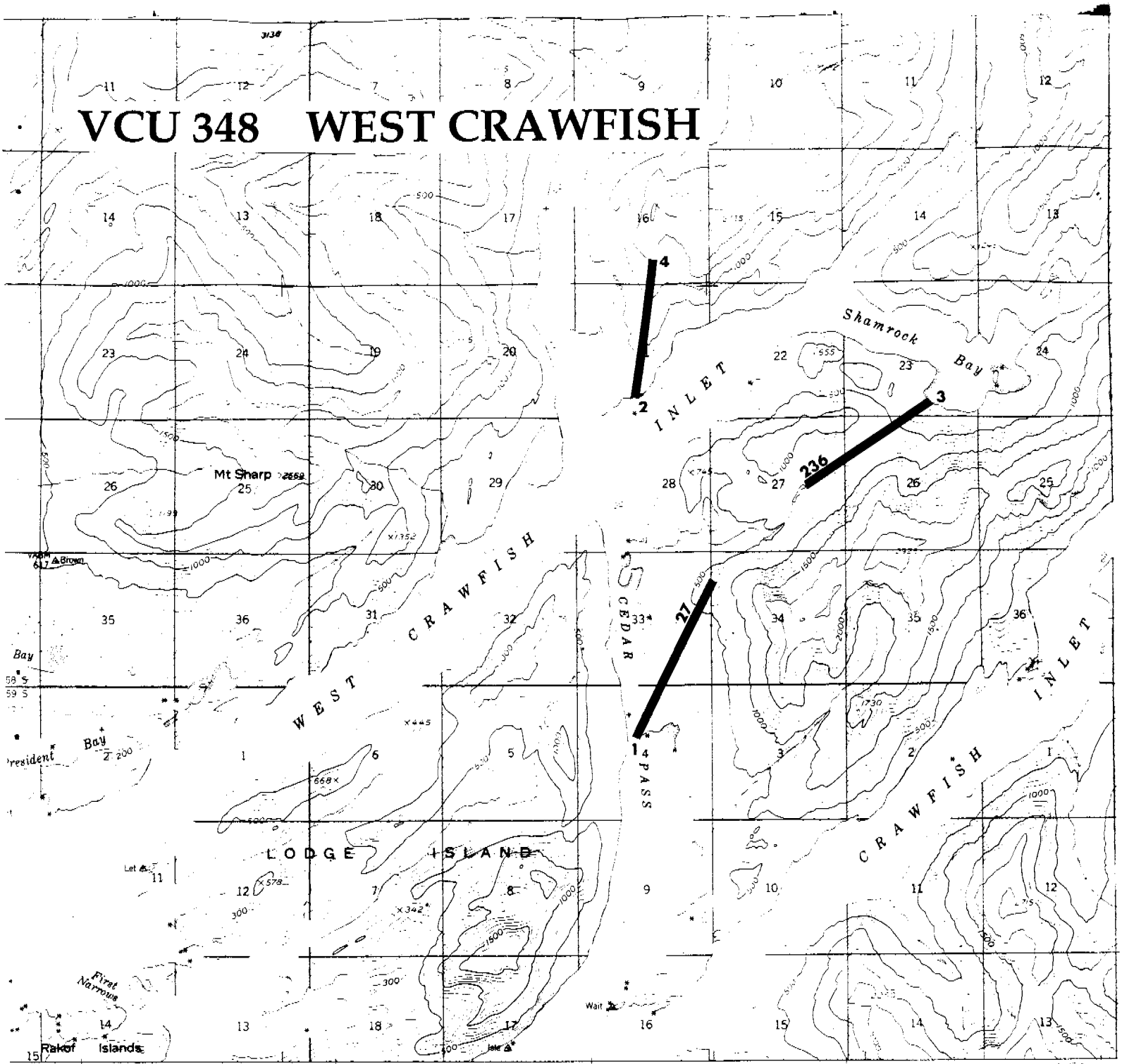
[a]Transect location forms for these and all other VCUs are located in the ADF&G Southeast Regional Office, Douglas.

VCU 82 NEGRO CREEK




PORT ALEXANDER (D-5) QUADR
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
BD-68
VCU 321 REDOUBT BAY
Aleutkina Bay
Sitka Townsite National Forest Bdy
Gull Isle
Pirate Cove
Cape Burunof
Sandy
Deep Inlet
Obsechki I
Calming I
Mielkoi Cove
Mt Kinkaid
The Pyramids
Kizhuchia Creek
Povorotni Point
Kita I
Kamennoi I
Glagolm
Caution I
Ulinol I
Taigud I
Taigud Islands
Redoubt Bay
Round I
Fankuda Islet
Unishka
Koka I
Shoals
Iput I
Sosnovoi I
Kidney Cove
Mt Dranishnikof
Redoubt Lake
Kanga I
Kanga Passage
Kanga Bay
Frosty Reef
Pelsat Island
Viesokoi Rock
Mt Mountain
Rapids
Colbert
BAR
37
40
123
41-45
48-50
46

VCU 348 WEST CRAWFISH



lished by the Geological Survey

ic methods from aerial photographs
951 Map not field checked

mpiled from USC&GS Charts
information is not intended

projection, 1927 North American datum
ka coordinate system, zone 1
se Mercator grid ticks.

ed and unmarked locations
Alaska, Division of Lands
ridian

only the wetter areas,
ned from aerial photographs

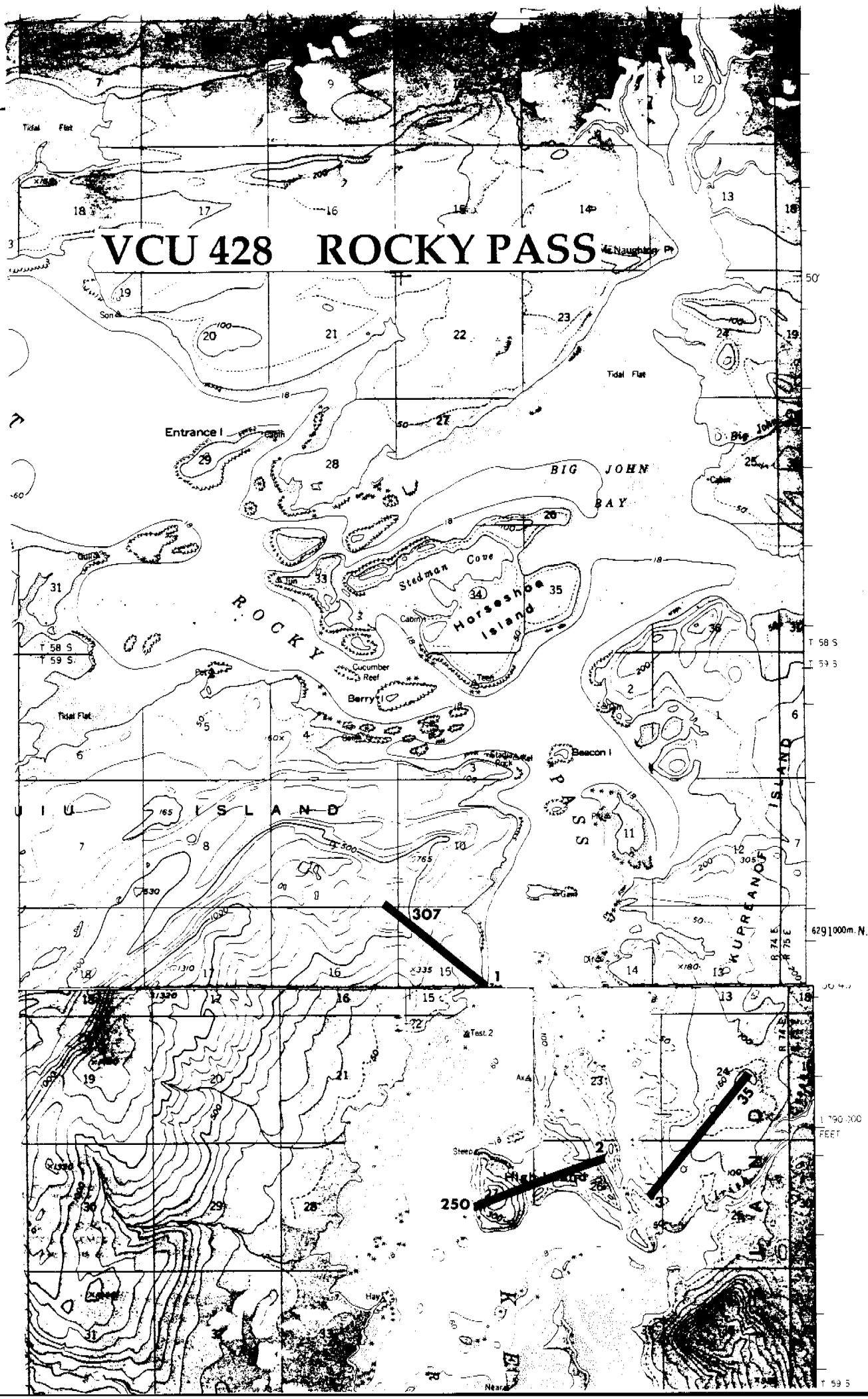
ngass National Forest
usion areas

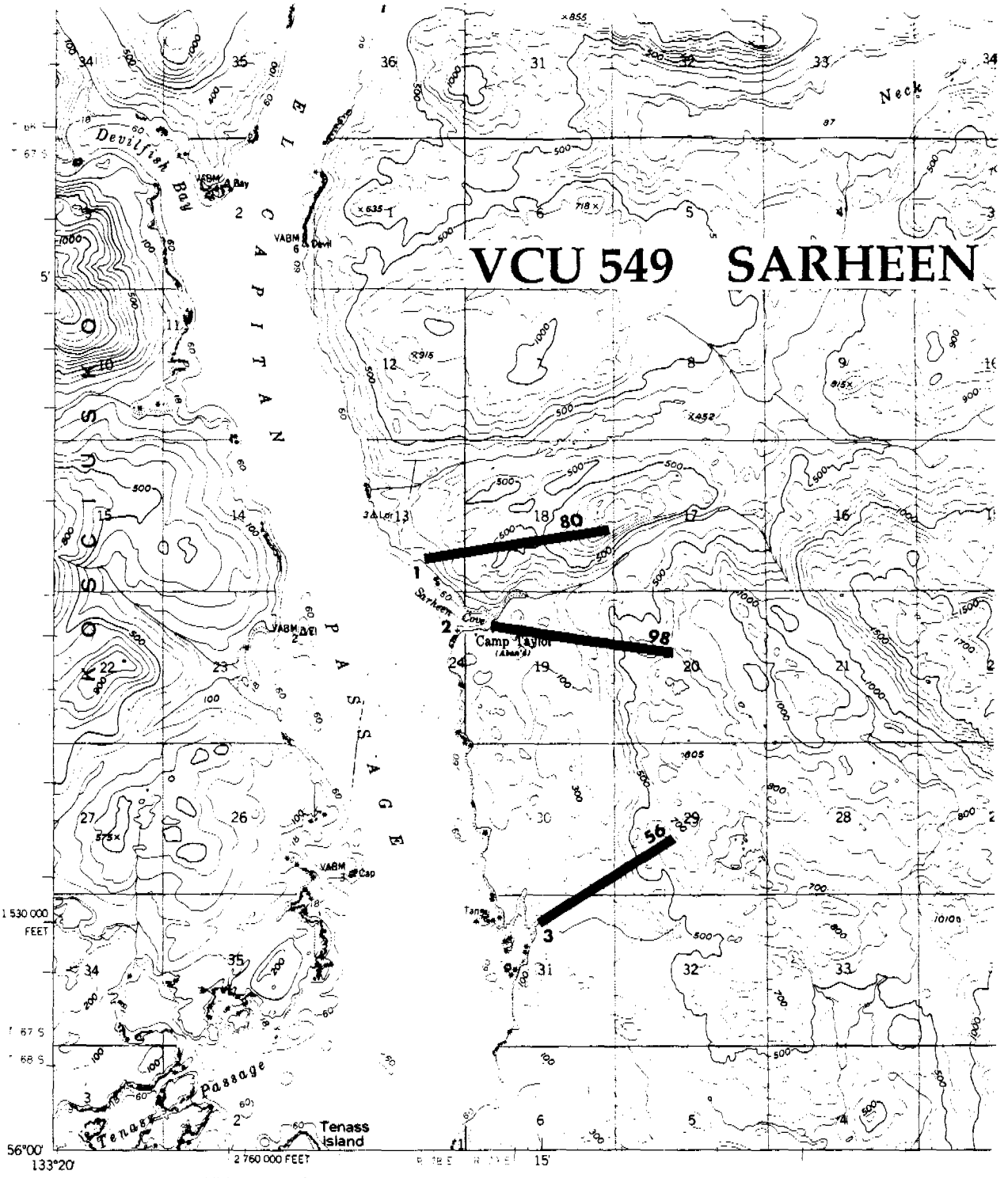
29°
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN
DECLINATION, 1961

SCALE 1:63360

CONTOUR INTERVAL 100 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES IN FEET DATUM IS MEAN LOWER LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 8 FEET

FOR SALE BY U.S. GEOLOGICAL SURVEY
FAIRBANKS, ALASKA 99701, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST


VCU 428 ROCKY PASS
Tidal Flat
Entrance I
BIG JOHN BAY
Stedman Cove
Horseshoe Island
ROCKY PASS
Cucumber Reef
Berry I
Beacon I
KUPREANOF ISLAND
307
250
35
T 58 S
T 59 S
629 1000m. N.
1 790 000 FEET



(CRAIG D-5)

Mapped, edited, and published by the Geological Survey

Control by USC&GS

Topography by photogrammetric methods from aerial photographs taken 1948, field annotated 1949. Map not field checked

Selected hydrographic data compiled from USC&GS Charts 8160 (1952), 8171 (1949), 8172 (1951), and 8201 (1951). (1:217,828-scale) This information is not intended for navigational purposes

Universal Transverse Mercator projection, 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 1
1000-meter Universal Transverse Mercator grid ticks, zone 8, shown in blue

Land lines represent unsurveyed and unmarked locations predetermined by the State of Alaska, Division of Lands Copper River Meridian

Swamps, as portrayed, indicate only the wetter areas, usually of low relief, as interpreted from aerial photographs

Entire land area is within the Tongass National Forest

TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1949

CONTOU
DATU
DEPTH CURVES IN FEE
SHORELINE SHOWN REPRESE
THE AVERAGE RA

FOR SALE BY
FAIRBANKS, ALASKA 99701, DENVER
A FOLDER DESCRIBING TOPOGRAPH

APPENDIX II

Winter Weather Conditions

1989

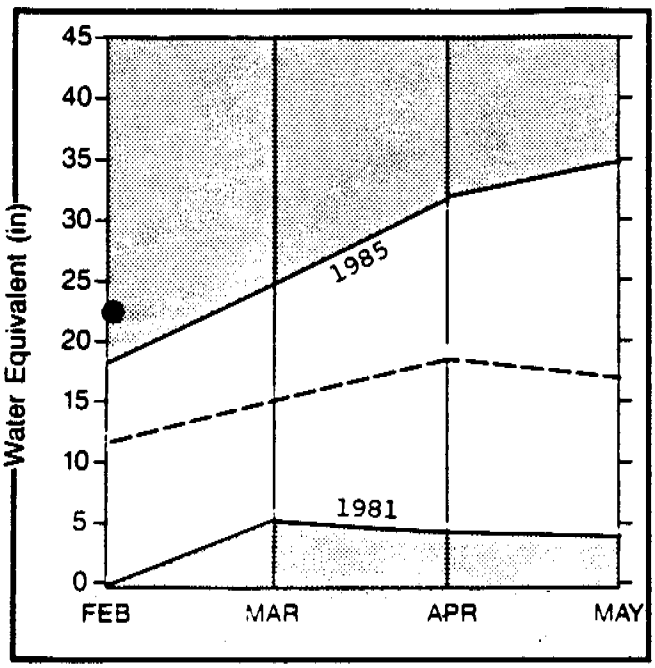
Winter Weather Conditions

January - April 1989

data from:
Alaska Snow Surveys, USDA Soil Conservation Service,
Anchorage, Alaska. monthly reports on file, ADF&G, Douglas.

Southeast

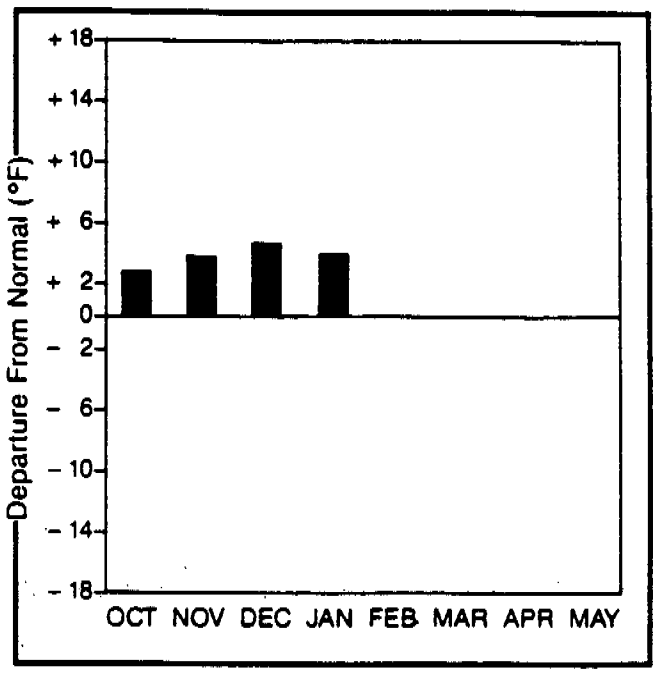
Douglas Island snowpack* (inches)



*Based on selected stations

Maximum
Minimum
since 1968
Average
Current

Juneau Temperature (degrees F)



National Weather Service Station

Monthly temperature

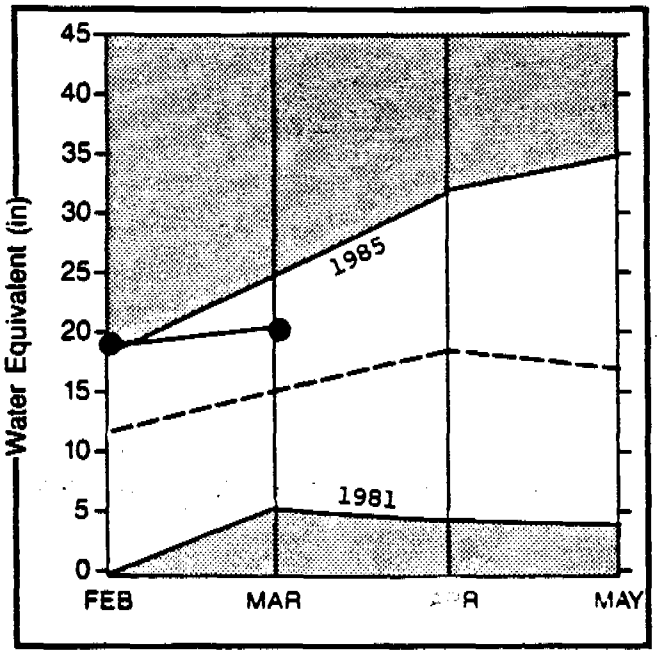
SNOWCOVER:

While the rest of the state was experiencing clear skies and a record cold wave during January, southeast had relatively mild temperatures and heavy snowfall at the northern end and rainfall at the southern end. The northern end has been wet all winter so that the resultant snowpack is extremely heavy. Snow on Douglas Island is maximum for the last 13 years and at least 50 percent or more greater than the estimated 25-year average.

For more information contact your local Soil Conservation Service office in Anchorage, 271-2424.

Southeast

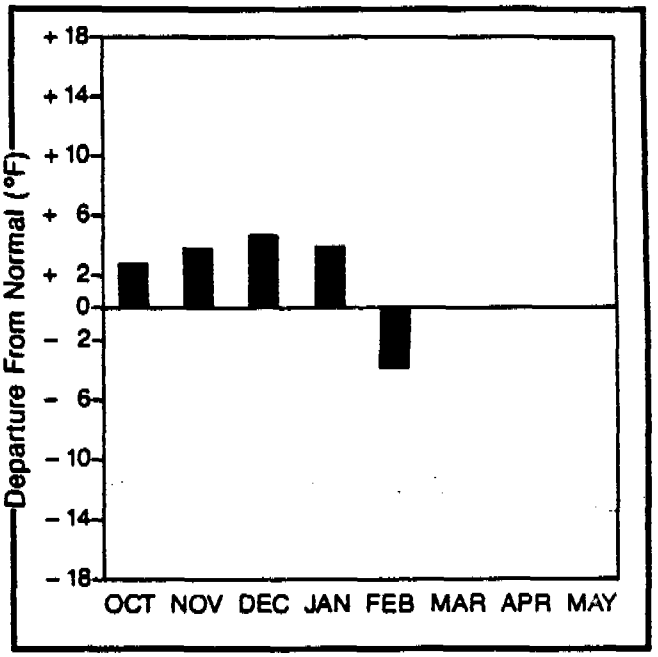
Douglas Island snowpack* (inches)



*Based on selected stations

Maximum
Minimum
since 1968
Average
Current

Juneau Temperature (degrees F)



National Weather Service Station

Monthly temperature

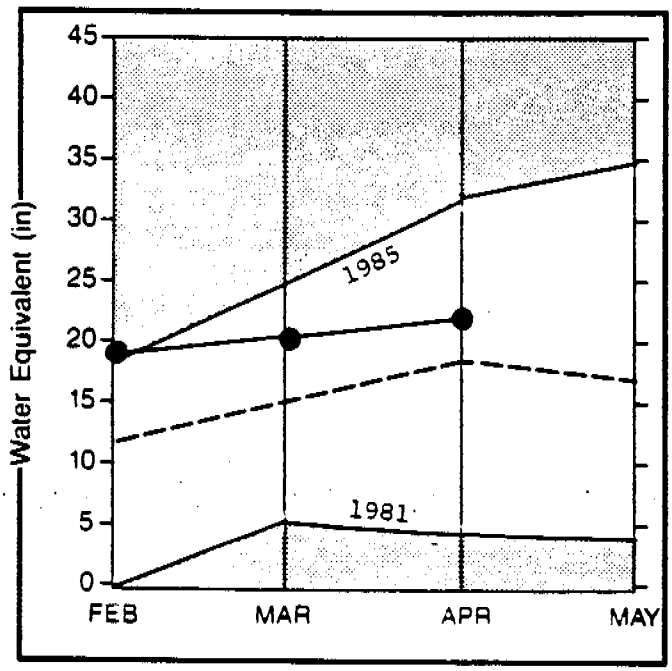
SNOWCOVER:

The entire region experienced one of the lengthiest periods of beautiful weather in memory--nearly an entire month of sunny days. Whereas normal monthly precipitation ranges from 4 to 12 inches across the region, the most recorded was one-half inch at Ketchikan, barely 4 percent of normal, which was a lot compared to the rest of the region. This resulted in a drastic drop-off in the snowpack's relation to normals for March 1st. The snowpack is now only about average over the northern half of the region at the higher elevations. The lower elevations, however, continue to exhibit the heavy snow conditions reported a month ago. This reflects the cooler than normal temperatures over the month, consequently less than normal melting. Snow along the Speel River was found to be an exception--well below normal.

For more information contact your local Soil Conservation Service office in Anchorage, 271-2424.

Southeast

Douglas Island snowpack* (inches)



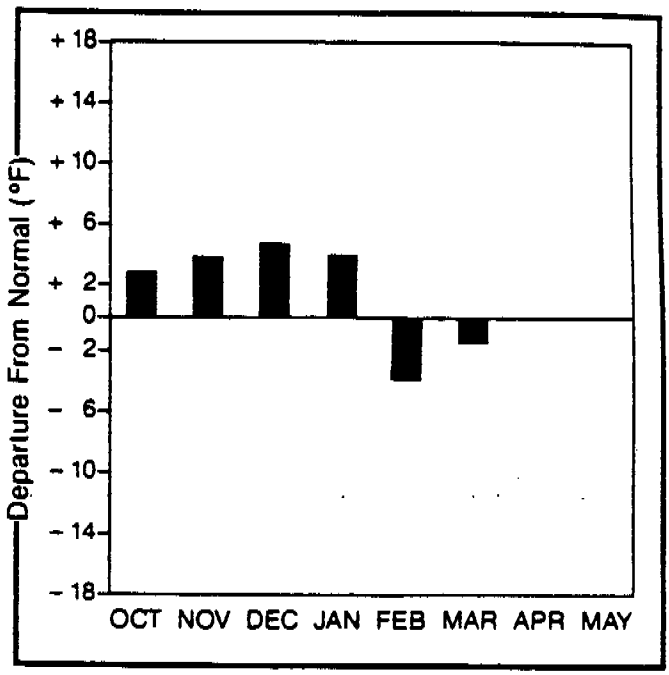
*Based on selected stations

Maximum ——— Average - - - -

Minimum ——— Current ———

since 1968

Juneau Temperature (degrees F)



National Weather Service Station

Monthly temperature

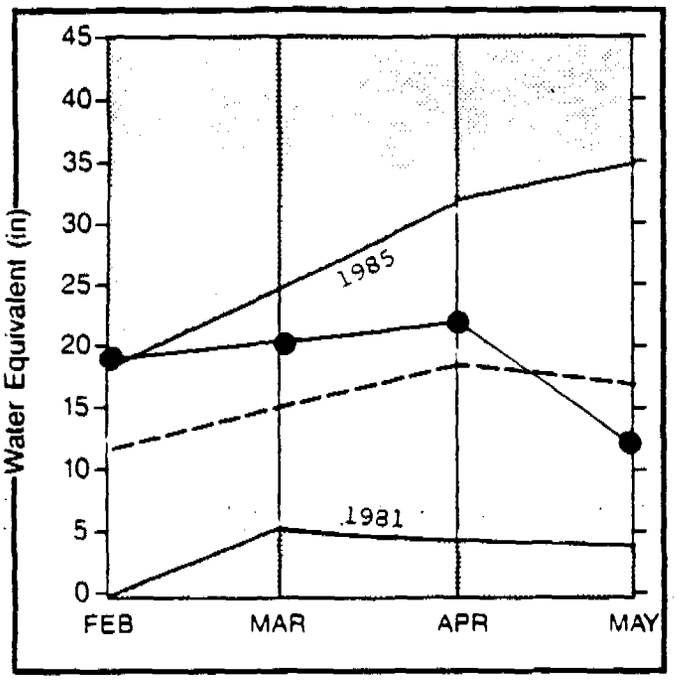
SNOWCOVER:

March makes the second month in a row of very dry conditions, region-wide. New moisture ranged from only 25 to 50 percent of average for the month, which might have seemed like a lot compared to the practically zero amount that fell in February. However, the snowcover is still above average at the lower elevations in the northern two-thirds of the region due to the lack of melt taking place. It decreases rapidly, percentagewise, with increasing elevation to well below average amounts near timberline.

For more information contact your local Soil Conservation Service office in Anchorage, 271-2424.

Southeast

Douglas Island snowpack* (inches)



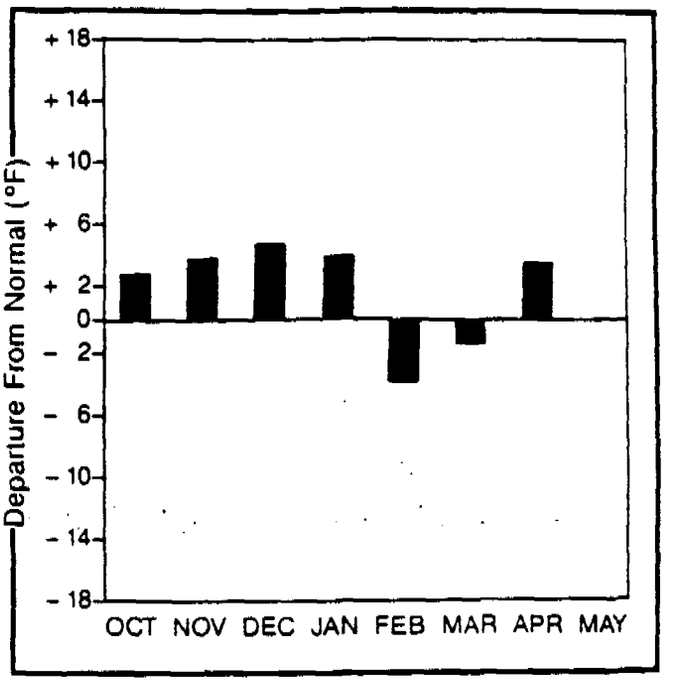
*Based on selected stations

Maximum ———— Average - - - -

Minimum ———— Current ————

since 1968

Juneau Temperature (degrees F)



National Weather Service Station

Monthly temperature

SNOWCOVER:

Extremely dry conditions prevailed over the region for the third month in a row. Little more than one-third of normal moisture fell anywhere during April. The accumulated precipitation over the last three months amounts to between 15 and 25 percent of normal, region-wide. The remaining (higher elevation) snowpack is somewhat better off since it represents the whole winter season. It's about 60 to 70 percent of average near Juneau and 70 to 80 percent near Petersburg.

For more information contact your local Soil Conservation Service office in Anchorage, 271-2424.