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

Sitka Black-tailed Deer Pellet-Group Surveys In Southeast Alaska 2008 Report

Federal Aid in Wildlife Restoration, Annual Report 1 July 2007–30 June 2008

By

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Douglas, AK

2008

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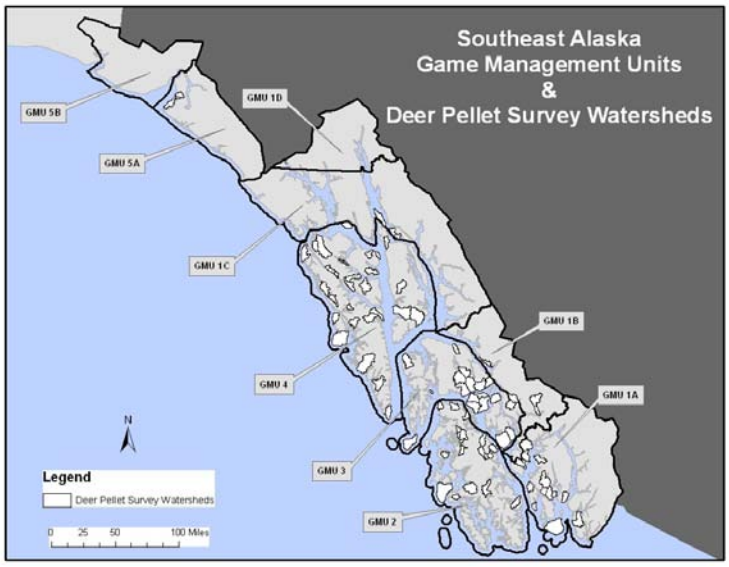
Acknowledgments: I wish to acknowledge all of the individuals that have contributed to the collection and compilation of these data over the years. The deer pellet-group survey program would not be possible without the interest, dedication, and support of ADFG and USFS staff as well as community volunteers.

Deer Pellet-Group Surveys: Overview



This report provides a summary of pellet surveys conducted for Sitka black-tailed deer during April and May 2008 in Region 1—Southeast Alaska. This information was collected by the Alaska Department of Fish and Game (ADFG), Division of Wildlife Conservation in collaboration with the U.S. Forest Service (USFS). Pellet-group data are used to monitor deer population trends in specific watersheds throughout the region and are intended to document large changes (≥ 30%) in deer density . The data also permit general comparisons of deer numbers from area to area and year to year within the region.

Deer pellet surveys have been conducted in Region 1 since 1981. Transects have been established in fixed locations within value comparison units (VCUs) for each game management unit (GMU). Value comparison units are USFS timber management units and are roughly equivalent to a watershed. Each VCU usually has 3 transects. These transects traverse deer winter range from sea level to 1500 feet, although some transects are flatter or undulating. Transect locations are chosen based on a number of different considerations, including: habitat characteristics, harvest pressure, management concerns, and accessibility. VCUs of higher management concern are monitored on a yearly basis, while others may only be surveyed every two or three years. Over time the monitoring of some VCUs has been abandoned in lieu of monitoring other VCUs, usually in relation to changes in management concern or habitat (such as logging).

The reader is referred to Kirchhoff and Pitcher[1] for a more detailed discussion of objectives, sample design, and field methodology of this program.

Sitka Black-tailed Deer resting on beach in Nakwasina Sound, late March 2008. Photo by Phil Mooney.

[1] Kirchoff, M. D., and K. W. Pitcher. 1988. Deer pellet-group surveys in Southeast Alaska, 1981-1987. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Progress Report Project W-22-6, Job 2.9 Juneau. 113pp.

Deer Pellet-Group Surveys: Overview - Continued

The interpretation of pellet group data should be done with caution, as more than changes in deer population size can affect deer pellet-group density. Snowfall patterns influence the distribution and density of deer pellets from year to year, and snow persisting late into the spring at elevations below 1500 feet limits our ability to consistently survey the same elevation zone among years. Occasionally all transects in a VCU cannot be surveyed, which can influence pellet density results if there is high variability between transects. Furthermore, comparisons over time, or from area to area, are most valid when weather conditions are similar. Pellet groups decompose more rapidly with increasing precipitation and warmer temperatures, potentially confounding comparisons. There are also weather-related differences in deer distribution from year to year. In mild winters, deer will access forage in a variety of habitats, including logged areas that have not yet entered the stem exclusion phase (at approximately 30 years). However, in severe winters, deep snow buries forage and makes movement difficult. When evaluating deer pellet data, consider winter severity and snowfall patterns, the number of plots sampled from year to year, the variability in the data, and the length of time since the last survey.

Old growth forests are considered primary deer winter range in part because heavy canopy cover intercepts the snow, making it easier for deer to move and forage during severe winters. When supplemental forage is available from non-primary winter range during mild winters, deer may increase to or above the carrying capacity of their primary winter range. When this happens, heavy mortality may occur during the next severe winter. Since deer utilize other habitats during mild winters and concentrate in old growth forests during severe winters, we expect higher pellet densities on winter range after severe winters—if the majority of deer live through most of winter. But early winter mortality could cause lower densities despite the unavailability of other habitats. In addition, if deer spend more of their time on the beach instead of in the forest, lower pellet densities on forest transects could result.

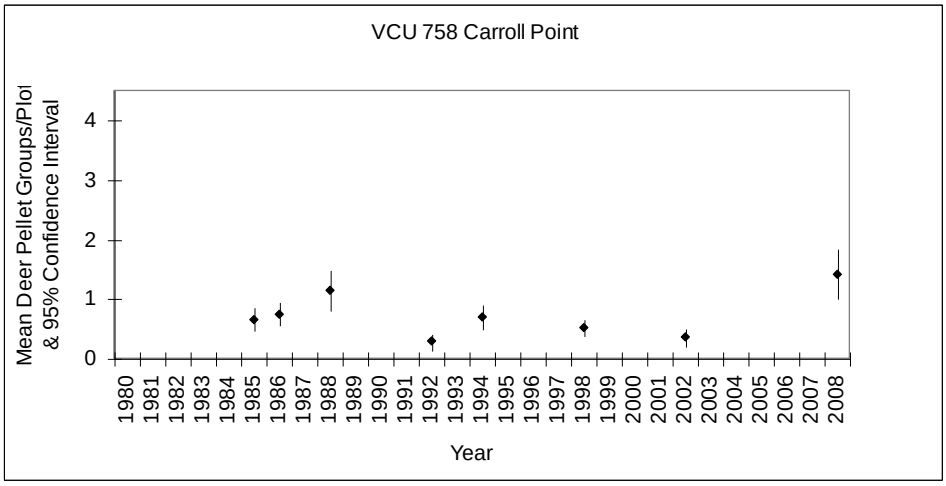
Although pellet densities were up in some watersheds and down in others, confidence intervals overlapped in most VCUs, indicating a need to wait and see what multi-year trend data reveals, with a few exceptions (Fig. 1, p. 5). Pellet densities were significantly different in 6 VCUs: 247, 435, 584, 368, 473, and 758. While pellet densities are significantly different in these watersheds, the reason for this change is not definitive. Higher pellet densities observed in VCU 247 are likely related to the lower than normal number of plots surveyed inflating pellet counts; more data is needed. Likewise, higher pellet densities in VCU 758 should be interpreted with caution until more data is collected because only one transect is sampled in this watershed. Although significantly different, lower pellet densities in VCU 435 are difficult to interpret because pellet densities are very low in this watershed overall. Because VCU 435 had not been surveyed for the 10 previous years, more recent data would be needed to establish current trends. Lower pellet densities in 584 could reflect lower deer numbers, or may simply be a return to deer distributions closer to those prior to the severe 2006-07 winter. While the 2007-08 winter in southern Southeast Alaska had a similar amount of snowfall as the 2006-07 winter (see p. 18), the snow did not fall until much later in the season, and was concentrated over a shorter period of time. This likely influenced deer distribution such that it was similar to the years preceding the 2006-07 winter. Much higher pellet densities in VCU 368 and 473, however, may indicate an increase in deer numbers in these watersheds since the previous survey year, which in both cases was prior to the recent severe winters.

Deer Pellet-Group Survey Summary: Southeast Alaska Winter 2007-2008

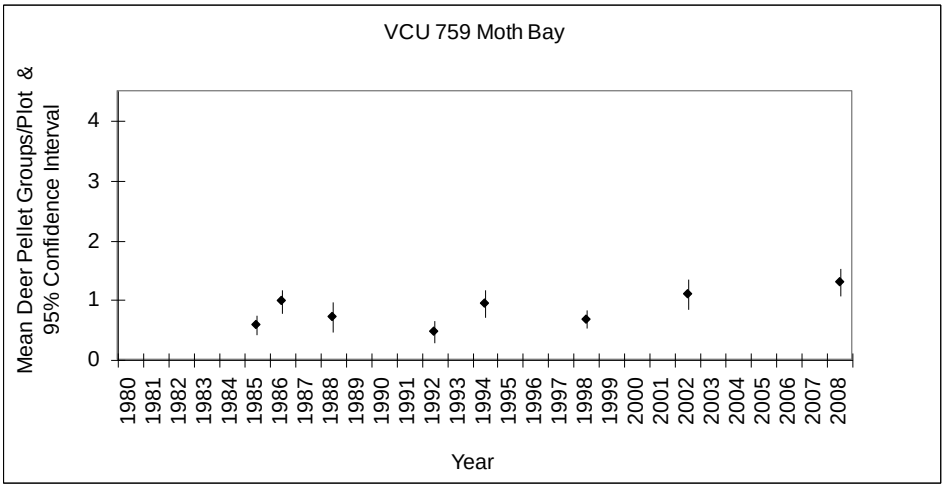
GMU	VCU Name	VCU	2008 Total Plots	2008 Mean (Pellet Group/Plot)	2008 Confidence Interval	Previous PG/Plot	Previous Survey Year	Previous # Plots	Previous Confidence Interval	% change
				NORTHERN SOUTHEAST ALASKA						
1C	North Douglas	35	316	2.84	2.49-3.19	2.28	2007	165	1.83-2.73	**24%**
1C	Inner Point	36	232	1.59	1.32-1.85	2.10	2007	182	1.70-2.50	**-24%**
1C	Shelter Island	124	321	1.05	0.90-1.21	1.10	2007	321	0.97-1.41	**-4%**
4Z	Hawk Inlet	128	290	1.33	1.12-1.55	1.19	2007	305	0.97-1.41	**12%**
4Z	Hood Bay	171	301	1.62	1.37-1.88	2.76	2006	355	2.50-3.02	**-41%**
4Z	Finger Mtn	247	199	3.32	2.87-3.78	1.89	2007	248	1.65-2.13	**76%**
4Z	M. Kelp Bay	298	208	1.91	1.63-2.19	2.10	2006	248	1.83-2.38	**-9%**
4Z	Nakwasina	300	166	3.17	2.66-3.68	3.40	2007	167	2.90-3.89	**-7%**
4Z	Sea Lion Cove	305	159	1.44	1.15-1.73	0.95	2007	221	0.73-1.16	**52%**
5Z	Yakutat Isl.	368	421	1.97	1.76-2.18	0.86	2004	274	no data	**129%**
				SOUTHERN SOUTHEAST ALASKA						
3Z	Castle River	435	275	0.12	0.07-0.17	0.36	1998	281	0.28-0.44	**-67%**
3Z	E. Duncan	437	262	1.37	1.10-1.65	1.89	2002	254	1.59-2.19	**-27%**
3Z	Woewodski	448	235	1.06	0.83-1.28	1.63	2007	180	1.26-2.00	**-35%**
3Z	Onslow	473	339	1.33	1.13-1.53	0.60	2006	363	0.48-0.71	**122%**
2Z	Thorne Lake	575	289	1.40	1.19-1.62	1.84	2007	204	1.54-2.15	**-24%**
2Z	Snakey Lakes	578	300	1.43	1.22-1.64	1.54	2007	290	1.30-1.78	**-7%**
2Z	Little Ratz	584	246	1.44	1.19-1.70	2.41	2007	233	2.06-2.77	**-40%**
2Z	12 Mile Arm	621	190	2.14	1.75-2.52	1.59	2007	189	1.32-1.86	**34%**
2Z	Port Refugio	635	342	1.53	1.33-1.73	1.72	2007	311	1.48-1.96	**-11%**
1A	Carrol Pt	758	122	1.42	1.00-1.83	0.36	2002	84	0.21-0.50	**294%**
1A	Moth Bay	759	191	1.30	1.08-1.53	1.09	2002	150	0.84-1.34	**20%**
1A	Dall Head	765	280	0.55	0.39-0.72	0.87	2005	177	0.62-1.12	**-36%**
1A	Duke Isl	767	291	0.16	0.09-0.22	0.19	2002	292	0.12-0.26	**-17%**
1A	Alava Bay	769	330	1.14	0.95-1.32	1.01	2006	92	0.75-1.27	**13%**

GMU 1A - Ketchikan Area

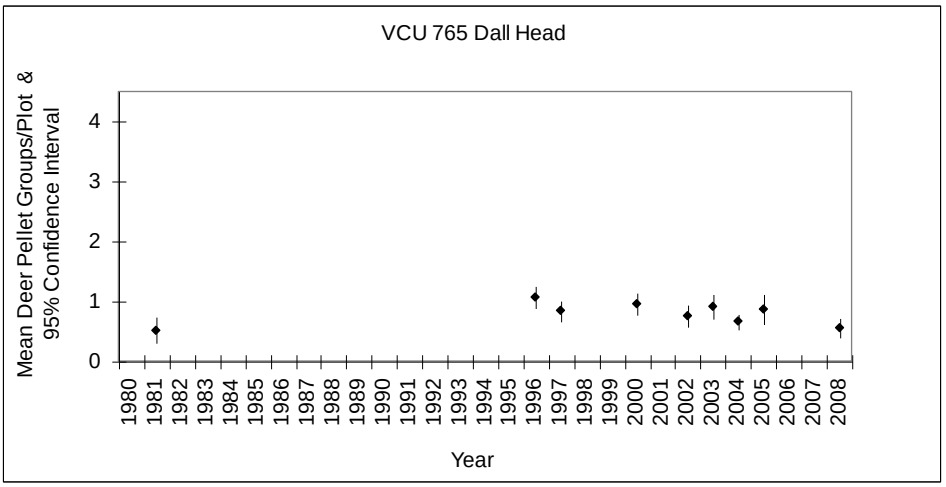
Carrol Point (VCU 758): One transect was established here on southern Revilla Island in 1988. Alone, the number of plots is too low to reliably evaluate deer trends in this VCU. However, these data combined with Moth Bay give a reliable assessment of deer populations on southern Revilla. Notes: the # of plots sampled/year has ranged from 84(1988) to 125(1994/98).*



Moth Bay (VCU 759): Two transects were established in Moth Bay on southern Revilla Island in 1985. Transect 2 has a west-facing aspect and climbs to a 1200 feet through mid-volume cedar and hemlock-spruce forest. Transect 3 undulates through similar forest, ending at 1100 foot elevation on an east facing slope. Combined with VCU 758, this provides a good indicator of deer populations on south Revilla Island. Note: only T3 was completed in 1988. The # of plots sampled/year has ranged from 78(1988)-191(2008).*



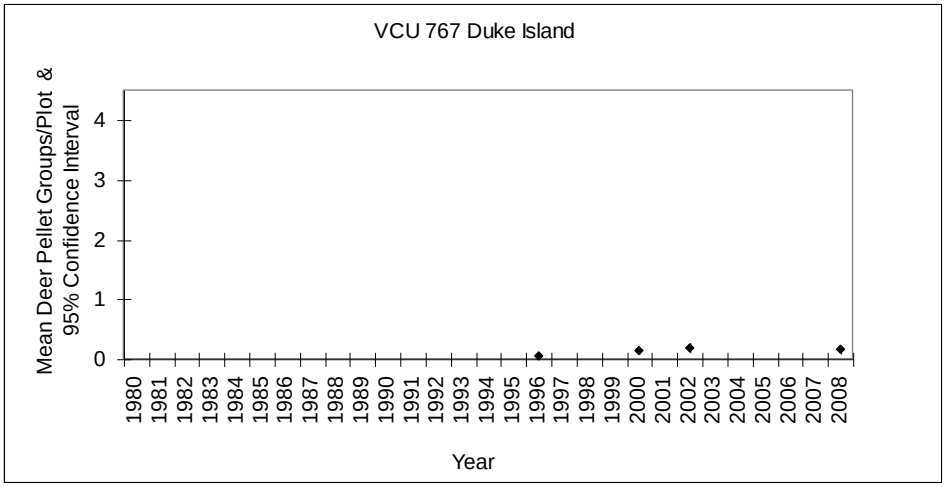
Dall Head (VCU 765): This area on the south end of Gravina Island was first sampled in 1981, but the location of the 1 transect conducted is unknown. Three permanent transects were established in 1996. Much of Dall Head has been exposed to windthrow and fire and consequently there are large areas of second growth including some well-stocked red cedar stands. There is evidence of significant fire events along 2 of the 3 transects. Most of the understory is brushy conifer & salal. Notes: only T2 and T3 were sampled in 2005. The # of plots sampled/year has ranged from 69(1981)-295 (1996).*



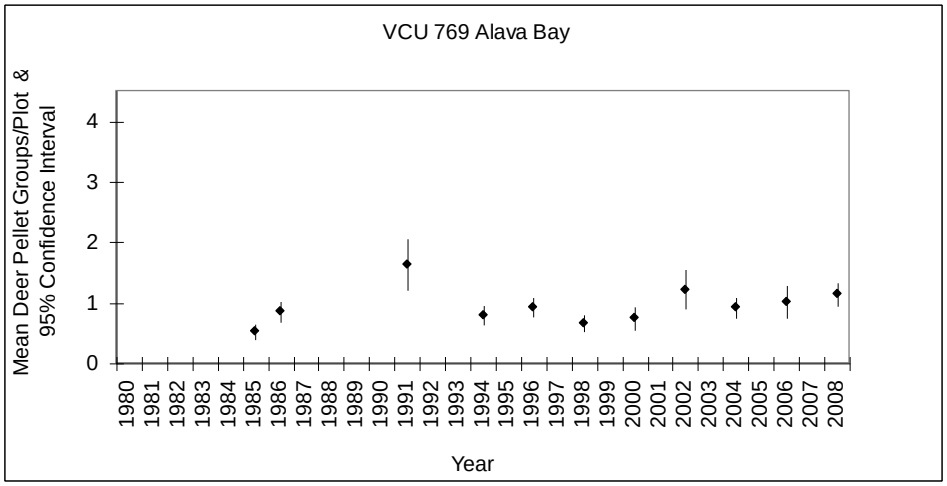
*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 1A - Ketchikan Area Continued

Duke Island (VCU 767): Three transects were established on the north end of Duke Island in 1996. Transects are characterized by heavy brush which consists primarily of mature salal, often reaching 4 feet in height. Most of the timber is low volume and consists of mixed conifer classes. There are little to no forbs available in the understory. Blueberry is present but minimal in most areas, with a few moderate patches available here and there. This area is does not provide more than marginal deer habitat, and therefore deer sign is has always been very low. Because there is little power to reliably monitor populations trends in areas were sign is scarce, we recommend discontinuing pellet surveys in this area in order to conserve resources for monitoring areas with more deer, greater hunting pressure, or management concerns. Notes: all three transects were run each year surveyed. The # of plots sampled/year has ranged from 282 (2000) to 294 (1996).*



Alava Bay (VCU 769): This VCU, located on the southeastern tip of Revilla Island, was first sampled in 1985. All three transecs have steep sections and are brushy with blueberry thickets up to four feet tall. Forest types are diverse, ranging from muskeg to high volume old growth. Notes: Only 2 transects (T1 and T2) were run in 1991 due to limited manpower. In 2002, all three transects were sampled, but the total # of plots (107) were limited to very low elevations due to snow (20-40 plots/transect). In 2006, only one transect (T3) was run due to manpower constraints, but it traversed the full 0-1500 foot elevation range. the # of plots sampled/year has ranged from 92(2006) to 335(1998).*

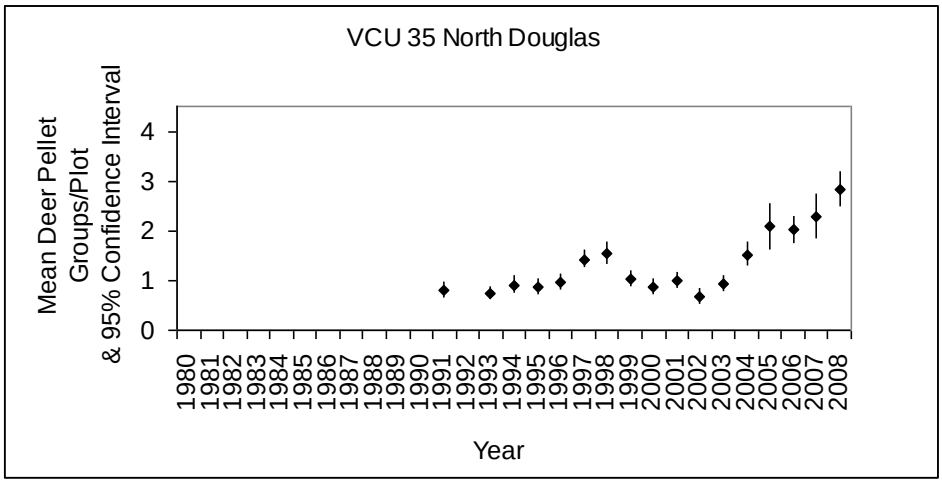


*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 1C - Juneau Area

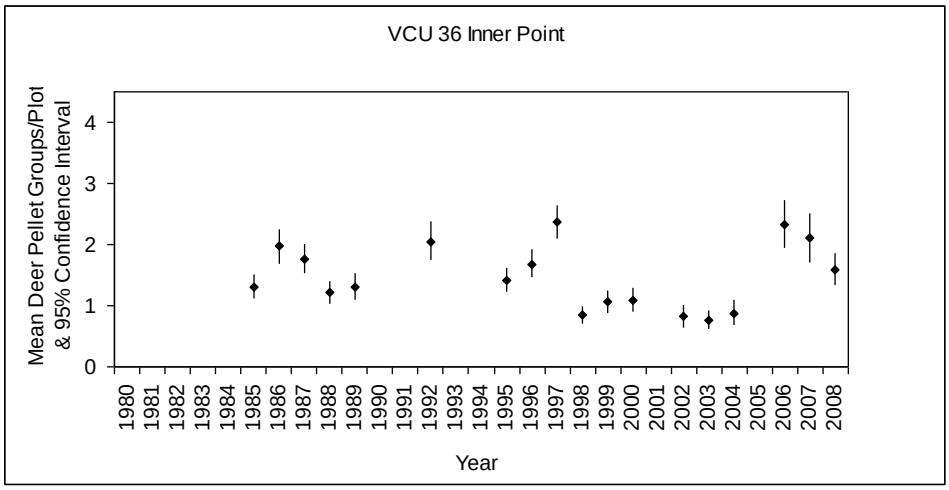
North Douglas (VCU 35): Douglas Island is located immediately opposite the city of Juneau and is heavily used by Juneau hunters. Three transects were established at the end of the road in 1991, and ADFG attempts to complete them every year. These transects rise to over 1000 feet in elevation and traverse moderate volume hemlock stands. In general, deer populations appear to be increasing in this area. However, it should be noted that the higher pellet densities during the 2006-07 and 2007-08 winters are also likely a result of higher concentrations of deer on primary winter range during these two severe winters.

Notes: Fewer plots were sampled on all three transects in 2002 due to snow covering the transect at higher elevations. Only transects 1 and 3 were sampled in 2005.
Fewer plots were sampled on all three transects in 2006 due to snow covering the transect at higher elevations. The # of plots sampled/year has ranged from 151(2005) to 335(2001).*



Inner Point (VCU 36): This drainage, located on the west side of Douglas Island, is popular with Juneau deer hunters. Because Douglas island is the most important hunting area for Juneau Hunters, ADFG attempts to complete these transects every year. However, because of high wind and sea conditions in Stephens Passage, access is sometimes difficult. This is a small VCU containing mostly low-volume forest, which is particularly brushy at lower elevations. Two transects (#1, #3) traverse from sea level to 1500 feet, while the third (transect #2), is low elevation and consists of 125 plots rising to approximately 500 feet. Pellet densities decreased during the 2006-07 and 2007-08 winters, indicating that these two severe winters may be taking their toll on the local deer population. It should be noted that pellet densities, although decreasing, are still relatively high compared to counts between 1998 and 2004. All three transects (232 plots) were completed in 2008*.

Notes: In 1986 rough water prevented access to transect #2 and #3, so transects running directly uphill from Inner Point and Middle point were substituted for that year only. Only T2 and T3were run in 1988. Selective logging in 1998 prior to the count may have displaced some of the deer population. Only T1 and T3 were run in 2002. Only transects T1 and T3 were run in 2006. All transects but fewer plots were surveyed in 2007 due to snow. The # of plots sampled/year has ranged from 147(2006) to 280 (1998/2000)*

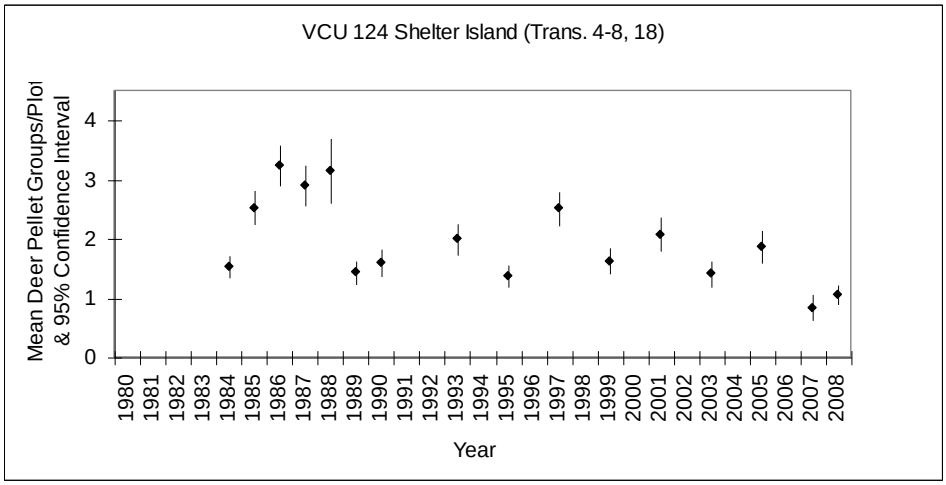


*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 1C - Juneau Area Continued

Shelter Island (VCU 124): Located north of Juneau in the 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 islands in this VCU, is primarily forested with a maximum elevation of 1,170 feet on the northern end. This VCU was sampled intensively from 1984 to 1986, but this practice was discontinued in 1987 because most of the south end is private property. Currently only transects 4, 5, 6, 7, 9, and 18 on the north end of Shelter Island are sampled. These transects were chosen because they were the most easily accessed and can a be done in one day with a six-person crew. The chart below displays only pellet densities on these 6 transects, including the intensive sampling period. Pellet densities for 1984-1986 that include all plots may be found in Appendix 1. The start location of transect #7 was missed in 1987 and it was run at least 1 mile south of it's proper location. The lower pellet densities recorded the last two years are likely the result of increased winter mortality during the 2006-07 and 2007-08 severe winters.

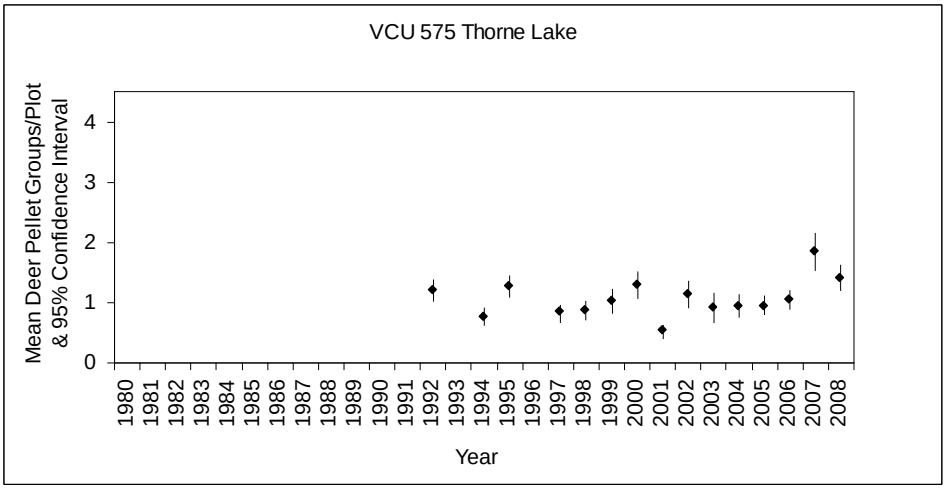
Notes: Not all transects were sampled every year. In 1988, only three transects (T6, T7, T18) were run. In 1993 T7 was not done. In 2001, T18 was not done. In 2005, T7 and T9 were not done. The # of plots sampled/year has ranged from 130 (1988) to 321 (2007/08)*



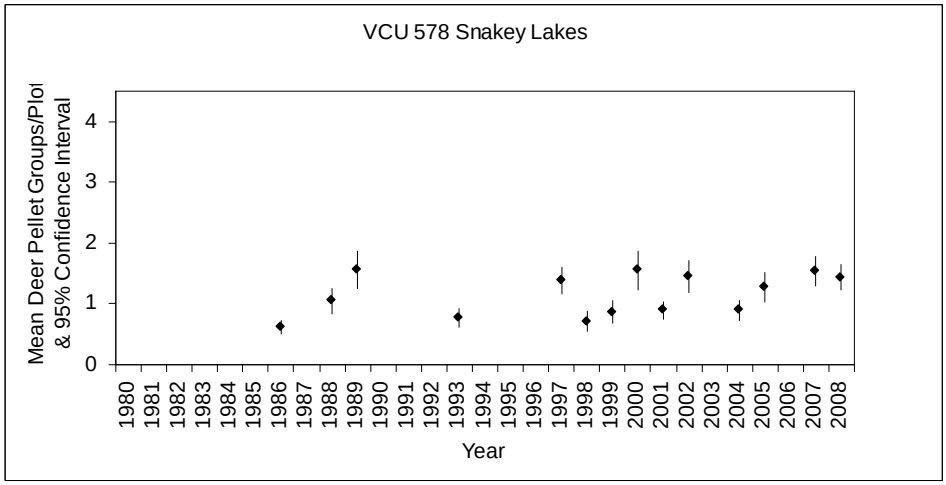
*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 2 - Prince of Wales Island

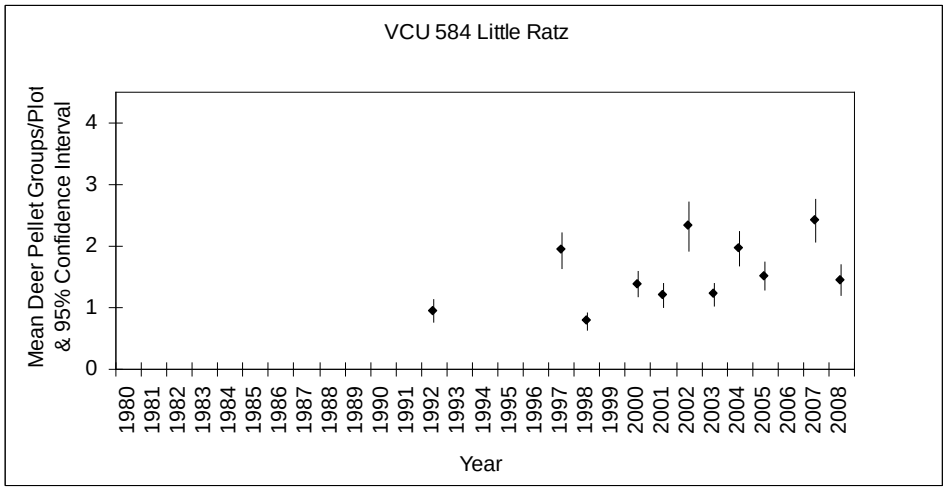
Thorne Lake (VCU 575): In 1992, four transects were established in along the Thorne River drainage, located in the central part of Prince of Wales Island. All four transects start along Road 3015 and are accessed by vehicle from Thorne Bay. Higher counts in 2007 were likely due to deer concentrating on winter range. Notes: A new start was established for T2 in 1994 due to logging , but it still hits the edge of a clearcut. Only T2, T3, T4 were sampled in 1999 & 2004. Only T3 & T4 were sampled in 2003. The # of plots sampled/year has ranged from 123(2003) to 334(1992).*



Snakey Lakes (VCU 578): Four transects (T1, T2, T3, T4) were established off the road system by USFS in this VCU in 1986. This is an inland VCU, located in the Thorne River drainage of Prince of Wales Island. Notes: Due to logging, a new start point for T3 and T4 was flagged in 1993. In 1998, T3 was not done. In 1999, T3 & T4 were not done. In 2002, T1 and T4 were not done. In 2004, T1 and T2 were discontinued due to logging and T5 was created. In 2007, T3 and T4 were replaced with T6 and T7. T5, T6 and T7 are the current transects. The # of plots sampled/year has ranged from 180(2002) to 358(2001).*



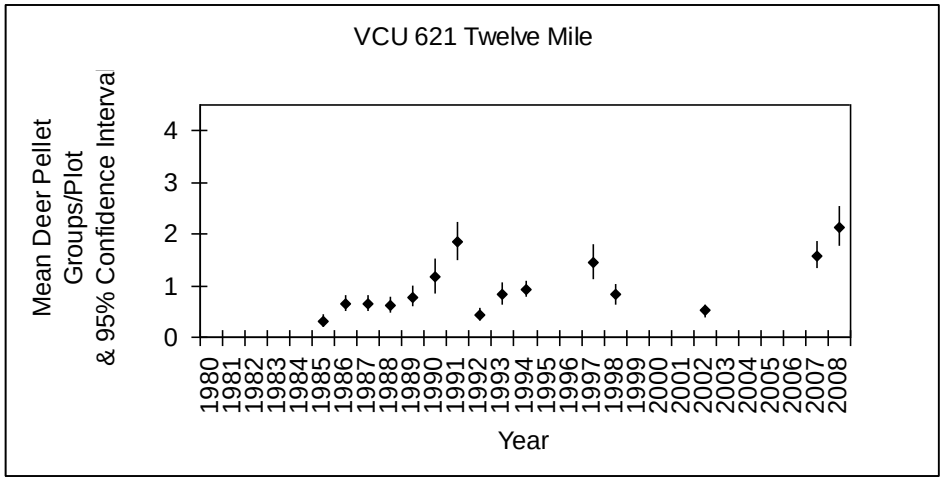
Little Ratz (VCU 584): Four transects were established in 1992 on the east coast of Prince of Wales Island. Access to all transects is by vehicle from Thorne Bay. Notes: all transects but fewer plots were run in 2002. T1 not run in 2004. T2 not run in 2007*. The # of plots sampled/year has ranged from 195 (2002) to 335 (2003).*



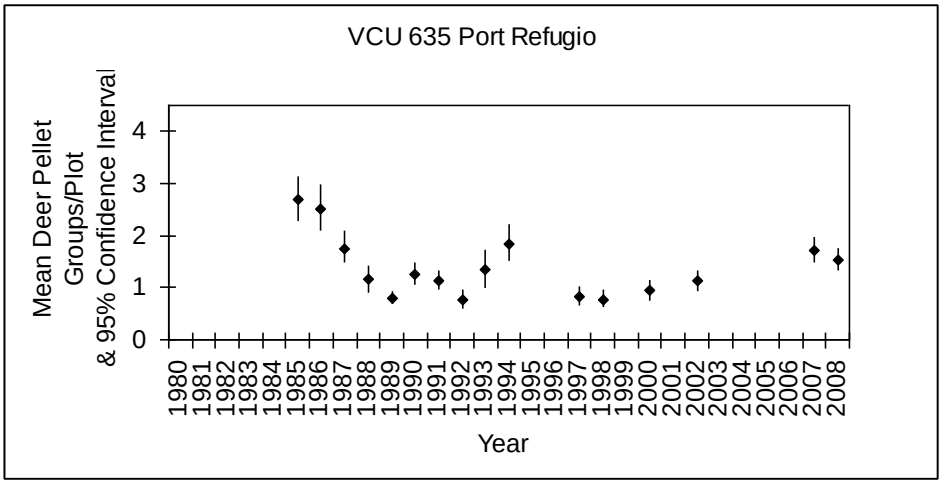
*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 2 - Prince of Wales Island Continued

12 Mile Arm (VCU 621): This VCU is located near Kasaan Bay on the east-central portion of Prince of Wales Island, and has been sampled by since 1985. Pellet densities in 2007 and 2008 were significantly higher than in 2002. Higher pellet densities were likely related to deer concentrating on winter range during these two hard winters, and could also be influenced by the inability of researchers to sample plots at elevations above 1000 feet due to persistent snow cover. However, these data could also indicate an increase in the deer population in this area. Notes: the # of plots sampled/year has ranged from 176 (1990) to 370 (1987).*



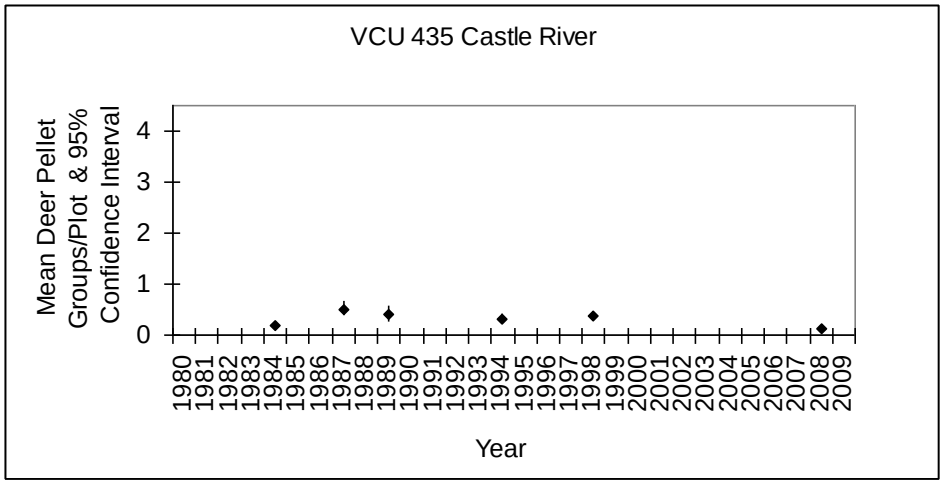
Port Refugio (VCU 635): This VCU is located on Suemez Island off the west coast of Prince of Wales Island in the Craig Ranger District. Pellet groups have been counted here since 1985. Substantial timber harvest has occurred on this island since pellet surveys were first implemented. In 2007, a new start tree was created on transect 1 in the general area of the old start tree, which could not be found. In 2007 on transect 3, a tree was marked on a logging road encountered after plot 30 to re-route the rest of the transect to the north, which was necessary in order to avoid a clearcut. These changes in transect route may have influenced pellet densities. Given the heavy logging in this area, deer pellet-group in 2007 and 2008 may be the result of deer congregating on primary winter range during these above-average snow years, but could also indicate an increased deer population in this area. Surveys after a mild winter will provide more information. Notes: the # of plots sampled/year has ranged from 213 (1993) to 507 (1989).*



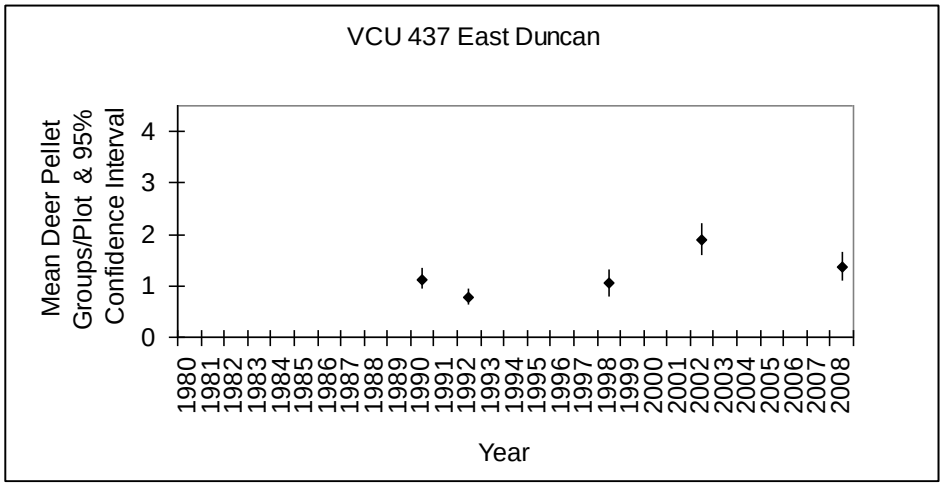
*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 3 - Central Southeast Alaska Islands

Castle River (VUC 435): Castle River, located in Duncan Canal on Kupreanof Island, as first sampled in 1984. One transect (T2) is located on Big Castle Island, while T1 and T3 are located on Kupreanof Island. The topography traversed is mostly flat and habitat is characterized by muskeg and non-commercial forest. The few good stands of trees are located along the beach and stream courses. While pellet-group densities have always been extremely low in this VCU, 2008 is the lowest pellet group density recorded to date. Notes: the # of plots sampled/year has ranged from 278 (2008) to 312 (1984, 1989).*



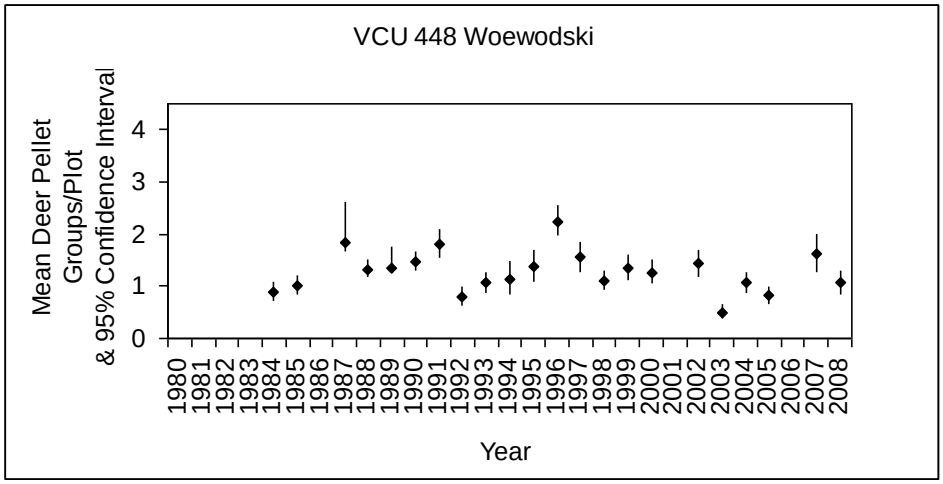
E. Duncan (VCU 437). Three transects were established on the east side of Duncan Canal in 1990. T1 is a low elevation transect which runs up to a 500-foot knob opposite the Castle Islands. Timber volume is mostly low, but deer pellet density is generally moderate. T2, brushy with a fair amount of blowdown, starts at the head of the bay and traverses mid-volume hemlock as it skirts a young clearcut. T3 starts out gradually running up a SW facing slope, but becomes very steep as it approaches 1500 feet elevation. T3 is characterized by moderate timber volume and pellet densities. Notes: A portion of T1 was clearcut in 1992, and high winds in 1998 prevented the crew from reaching the beach and so this transect was not completed that year. The # of plots sampled/year has ranged from 153(1998) to 262(2008).*



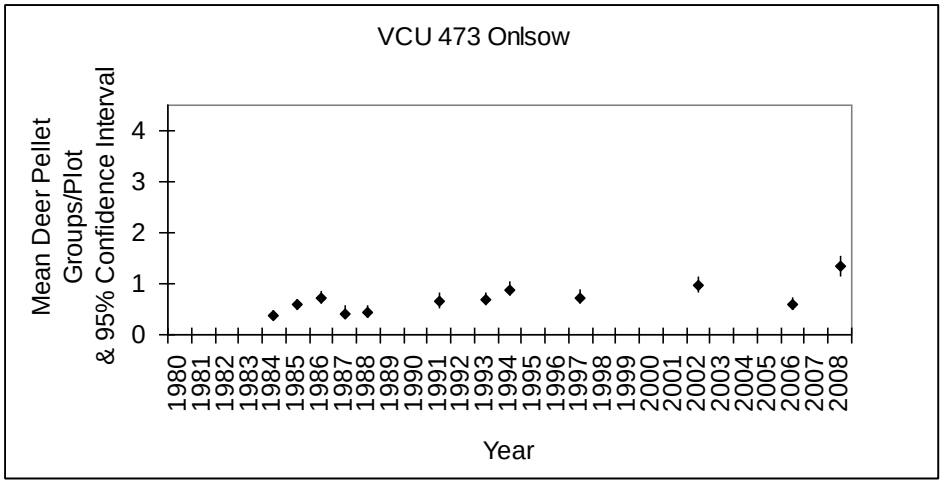
*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 3 - Central Southeast Alaska Islands

Woewodoski (VUC 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 elevation through moderate volume timber. It is interesting to note that despite heavy snowfalls the winter of 1998-1999, deer pellet group counts were slightly higher than the previous year, and remained in the same range during following surveys, indicating mortality during that severe winter was likely low. Corroborating evidence from deer radio-collared by the Forest Service confirmed this, as only one of 33 adult deer on Mitkof Island died of starvation that winter. Because deer were below carrying capacity in this area, their winter range was able to sustain them despite winter severity. High pellet counts have again been noted after the severe winters of 2007 and 2008, likely due to deer concentrating on winter range. Although there are no longer deer collared on Mitkof, continued pellet surveys will help biologists evaluate whether these deer faired as well as they did in 1999. Notes: the # of plots sampled/year has ranged from 152 (1994) to 433 (1988).*



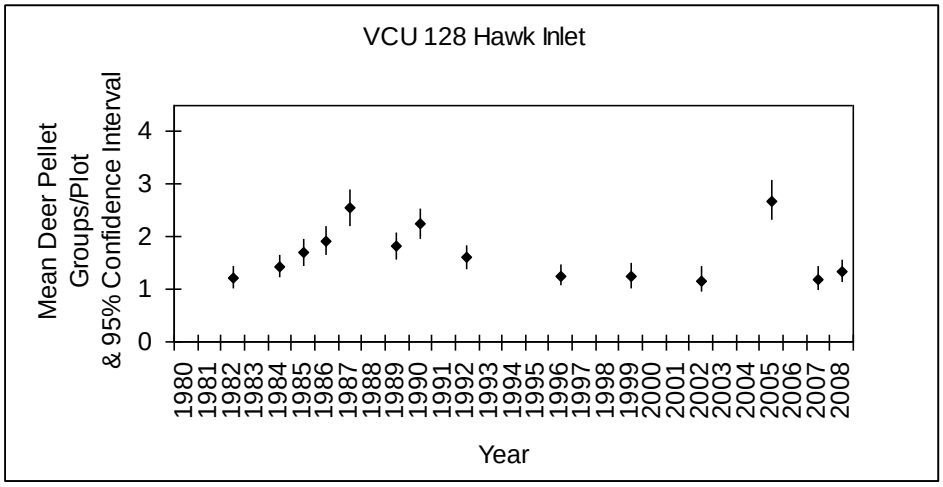
Onslow (VCU 473): In this VCU 2 transects are located on Etolin Island, and one is on nearby Onslow Island. Annual sampling between 1984 and 1986 indicated low but increasing deer numbers, and then a slight decline in 1987 and 1988. Pellet counts have remained fairly stable over the years. The 2008 count, was the highest on record to date, but this may be related to deer concentrating on primary winter range after this above-average winter. Future surveys will help managers determine whether this deer population is stable or in a state of change. Notes: the # of plots sampled/year has ranged from 321(1984) to 363(2006).*



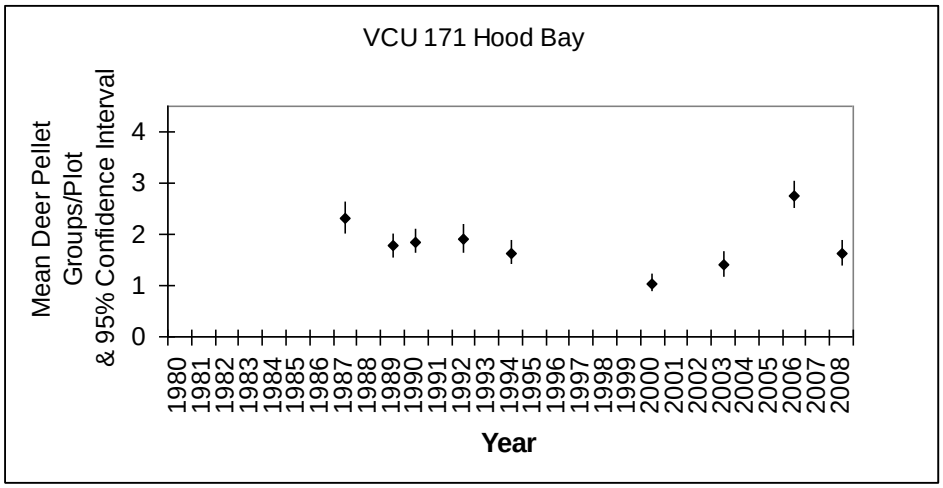
*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 4 - Admiralty, Baranof & Chichagof Islands

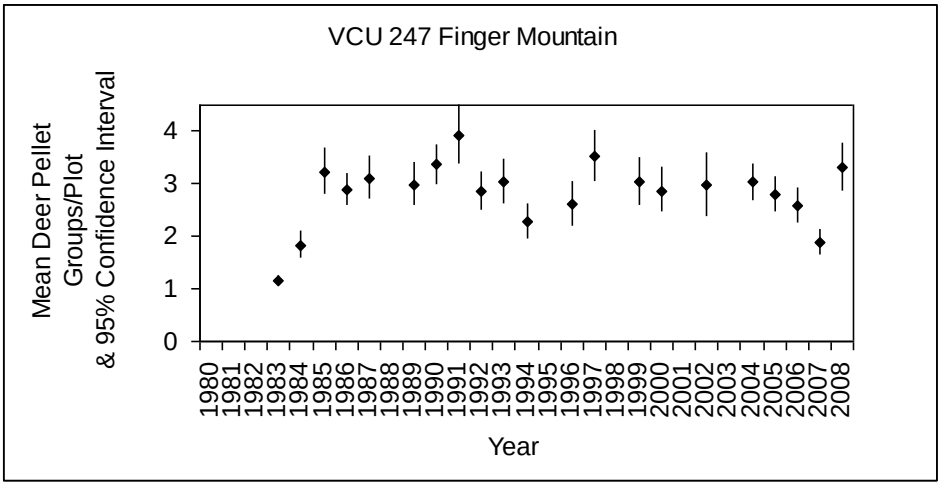
Hawk Inlet (VCU 128): Located on northern Admiralty island, this VCU was intensively sampled in 1982 on both sides of the inlet, with transects running to 1000 feet. In 1984, 3 transects on the NW side of the inlet were selected for continued sampling. This chart displays the results of the intensive sampling in 1982. Pellet densities were much lower in 2007 and 2008 than 2005. It Most likely the 2005 count was a survey outlier and deer populations in this area are fairly stable. Notes: the # of plots sampled/year has varied from 176 (1999) to 1605 (1982). *



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. T1 and T2 sample south-facing slopes to 1500 feet elevation. T3 samples riparian habitat in the south arm of Hood Bay. Notes: the # of plots sampled/year has ranged from 220 (2003) to 375 (1990).*



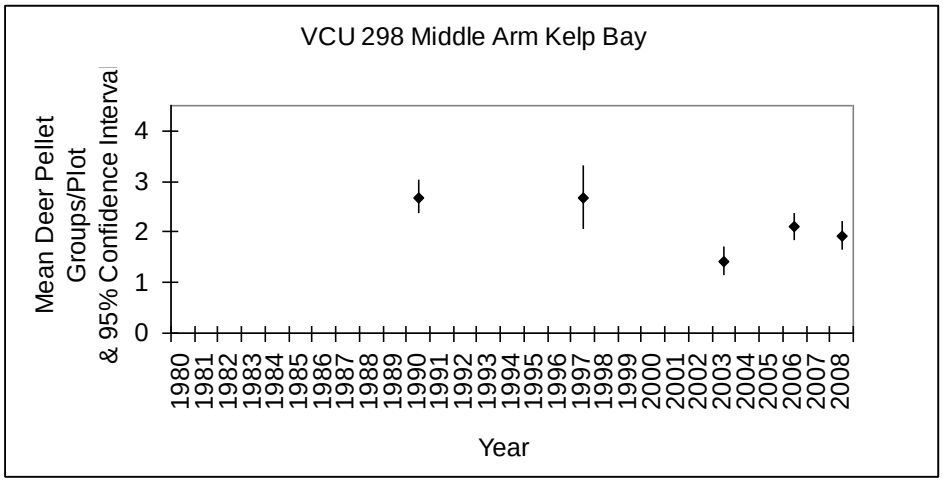
Finger Mtn (VCU 247): Located in Hoonah Sound, this VCU was intensively sampled in 1983 when 20 transects were completed. Three transects were chosen for long-term sampling in 1984. All transects have a SW facing aspect. This VCU is physiographically complex. While 3 transects probably do not reflect the entire VCU, repeating transects should yield useful trend data. Counts were in 2008 were the third highest recorded, after a 2007 count that was the third lowest for this watershed. Further surveys are needed to understand changes in deer density in this watershed. Notes: T1 & T2 were run on incorrect bearings in 1991. the # of plots sampled/year has ranged from 150 (1991) to 2145 (1983).*



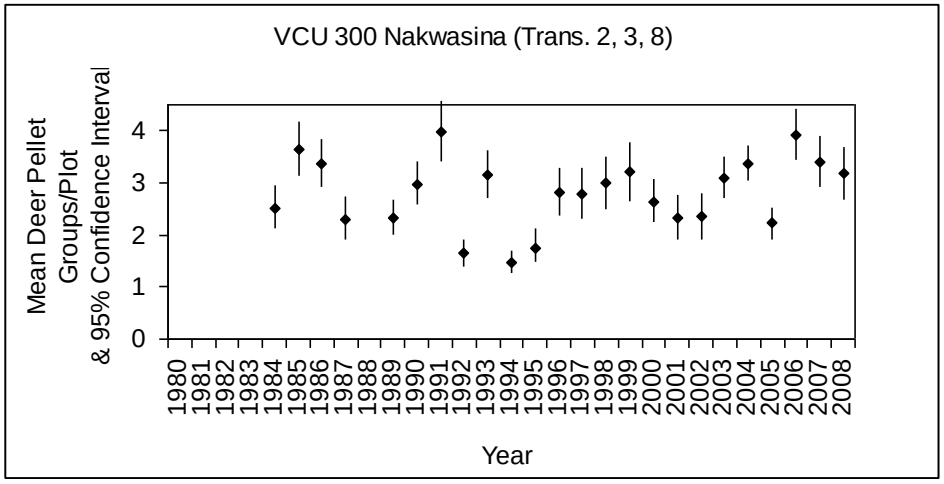
*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 4 - Admiralty, Baranof & Chichagof Islands Continued

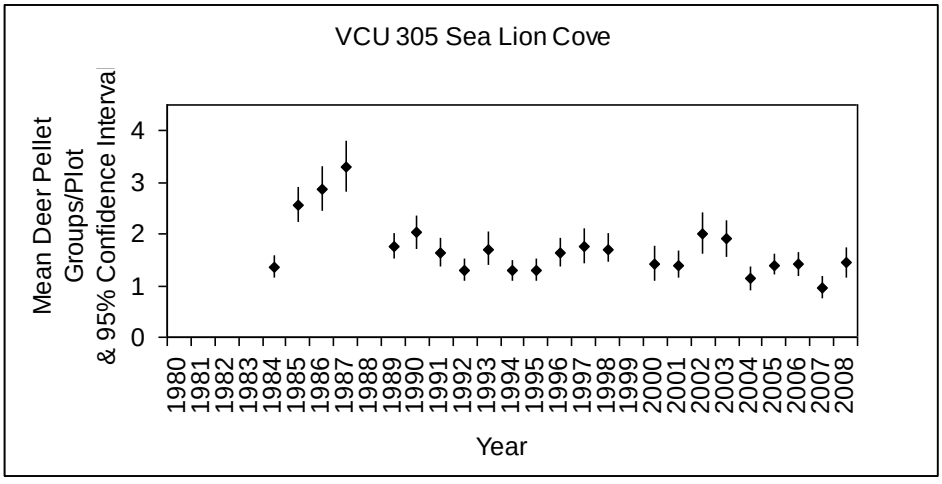
M. Arm Kelp Bay (VCU 298): Four transects were established in the middle arm of Kelp Bay in 1990. Notes: Only T3 and T4 were completed in 1997 persisting snow limited data collection. Only T1, T2, and T3 were completed in 2003 and 2008. The # of plots sampled/year has ranged from 100 (1997) to 306 (1990).*



Nakwasina (VCU 300): This VCU north of Sitka is popular with local hunters and has displayed some of the highest deer pellet densities in Southeast Alaska. First sampled in 1984 with 12 transects, it was sampled more intensively in 1985 and 1986. In 1987, three transects were selected for continued sampling. This chart displays only data for transects 2, 3, and 8 since 1984. All three transects have southerly aspects and traverse mid-volume forest to elevations of 1500 feet. Heavy browsing on *Vaccinium* has been noted on all transects, and deer are likely near carrying capacity. After the hard winter of 1990-91, deer pellet densities were high, likely from deer concentrating on winter range, but the 1992 low densities likely reflect die-off of from the 1990-91 winter. The winters of 2006-07 and 2007-08 were two of the most severe on record in northern Southeast Alaska. If deer populations were reduced, we would expect to see much lower densities after the next mild to moderate winter. Notes: the # of plots sampled/year has ranged from 138(1984) to 255 (1990).*



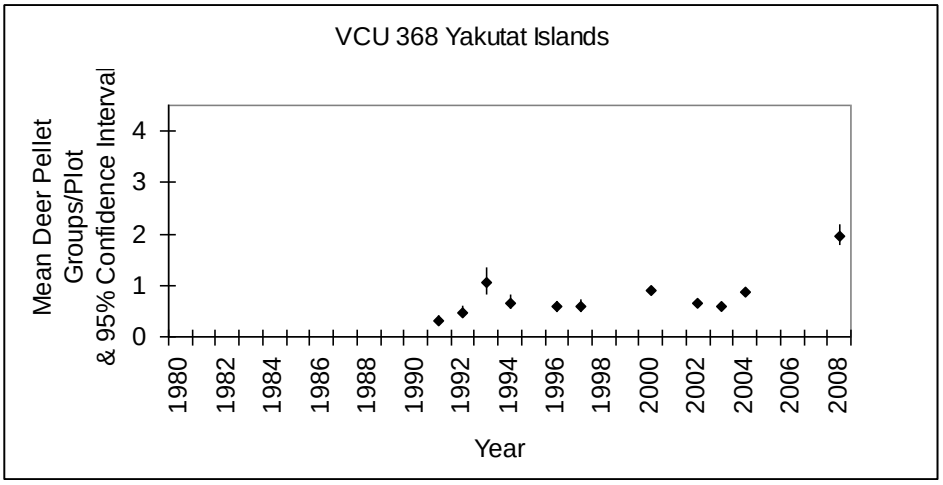
Sea Lion Cove (VCU 305): These three transects are accessed from Kalinin Bay on Kruzof Island and are low to mid-volume timber. Heavy browsing followed by severe winters in 1989-90 and 1990-91 may have contributed to a decrease in the population. Notes: In 1987 one transect was relocated to avoid steep sidehills and ravines. The # of plots sampled/year has ranged from 119(2002) to 320 (1984).*



*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

GMU 5 - Yakutat Area

Yakutat Islands (VCU 368): This VCU incorporates several islands found in Yakutat Bay: Krutoi, Kriwoi, Khantaak, and Dolgoi, but Krutoi has not been surveyed as often. One or two transects were established on each island in 1991. The habitat consists primarily of mid-volume hemlock with a blueberry understory. All transects are low elevation. While the islands are not considered ideal deer habitat, their maritime climate, low annual snowfall, and relative lack of predators probably contribute to the persistence of deer in this area. Pellet densities in 2008 were the highest ever recorded for this area, indicating that deer numbers may have drastically increased. Further surveys are needed to confirm this trend. Notes: The # of plots sampled/year has ranged from 106 (1993) to 421 (2008).*



*See Appendices 1 & 2 for # plots sampled & pellet group densities by VCU, elevation & transect. See Appendix 3 for # plots sampled & pellet densities by VCU & survey year.

Southeast Alaska Snow Report

USFS biologist Terry Suminski observes persistently high snow levels on May 5th at 800 feet elevation in Hood Bay, Alaska. Photo by Karin McCoy, ADFG wildlife biologist. Spring 2008.

Winter severity, particularly snow depth, can play an important role in determining deer distribution, nutritional condition, productivity and survival. As a result, biologists often rely on winter severity information in order to forecast effects of winter conditions on deer population dynamics. Due to the strong maritime influence on deer range in southeast Alaska, winter snow conditions can be extremely variable both within a given winter and between years. Snow depths vary considerably throughout the region with northern areas (e. g. Juneau) typically receiving more winter snowfall than more southerly areas (e. g. Ketchikan/Annette). Snow depth increases with increasing elevation, on northerly aspects, and where there is less or no canopy cover. Low elevation old growth forests provide important winter habitat for deer. In areas that are heavily fragmented naturally (such as by muskegs) or due to timber harvest, deer can have difficulty moving between patches of winter range. Deer begin to flounder at snow depths exceeding 18 inches (chest-height for a deer). Deep soft snow buries forage, causes greater energy consumption and increases vulnerability to predators and hunters. However, freeze-thaw cycles and the formation of deer trails can eventually condense snow, enabling deer to walk on top of the crust.

Snowfall in Inches for Southeast Alaska (Winter 2007-2008)[1]

Station Name	Oct	Nov	Dec	Jan	Feb	Mar	April	May	Total	Averages[2] 5	15	30	% change from 5-year average
Yakutat	0	14	23	44	52	29	21	1	184	136	152	153	36%
Elfin Cove	0	0	20	66	54	23	5	0	168	115	105	102	46%
Pelican	1	0	15	55	67	17	15	0	170				
Glacier Bay	0	0	26	41	35	9	4	0	115	103			12%
Gustavus	0	M	5	10	26	5	11	0	57				
Hoonah	0	2	18	39	29	22	8	0	117				
Skagway Power	0	0	13	28	5	11	2	0	58	48			21%
Skagway Customs	0	0	3	5	3	5	1	0	18	47			-61%
Haines Customs	0	4	60	83	36	58	7	1	248	235	251		5%
Haines	1	5	55	77	39	30	2	0	208	160			30%
Juneau Airport	0	5	13	23	44	14	14	0	112	96	88	83	17%
Annex Creek	0	13	103	79	80	32	22	0	329	268			23%
Hidden Falls Hatchery	M	M	27	61	65	12	1	M	166	91			81%
Little Port Walter	M	M	M	41	73	11	5	0	131	106			24%
Port Alexander	0	0	17	12	28	2	4	0	63	43			45%
Point Baker	0	0	2	8	17	6	0	0	33	30			7%
Petersburg	1	1	19	45	62	16	8	0	150	88			69%
Wrangell	0	0	11	31	43	4	2	0	91				
Blashke Island	0	0	1	10	28	1	1	0	42	30			40%
Meyer Chuck	0	0	7	9	16	0	0	0	32				
Annette WSO	0	0	12	14	22	9	2	0	59	31	37	33	90%
Craig	0	0	6	11	13	1	1	0	31	18			72%
Hyder	M	12	45	56	82	16	M	0	211	225			-6%

[1] Data from National Weather Service, NOAA website: http://www.arh.noaa.gov/clim/akcoopclim.php?wfo=pajk

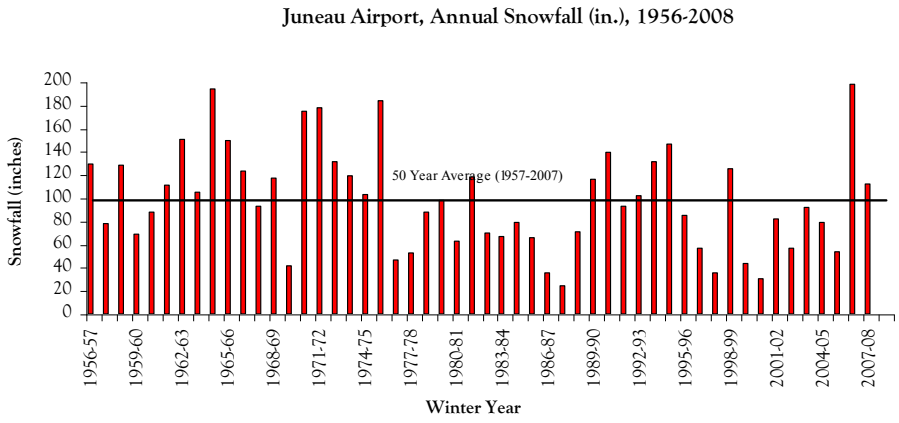
[2] Average of previous 5, 15, and 30 years (when available) through June of 2008

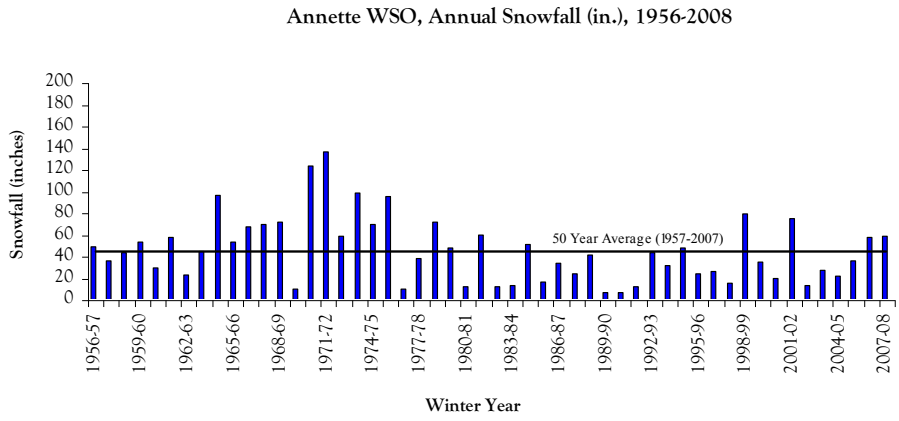
Southeast Alaska Snow Report - Continued

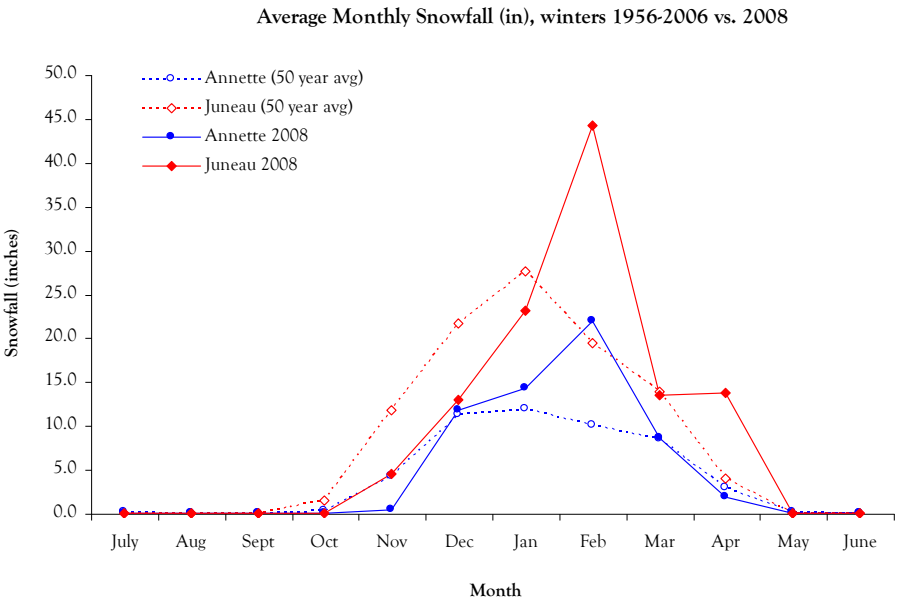
Between 1995-2006, winter conditions in southeast Alaska were relatively mild, with only 1 out of 11 winters having greater than average annual snowfall in the Juneau area, and 2 out of 11 in Annette. As a result, it is unlikely that winter conditions negatively affected deer populations during this period. However, the winter of 2006-07 had the highest recorded snowfall since 1956 in the Juneau area, and above average snowfall at Annette WSO. While there was much lower snowfall during the 2007-08 winter than the 2006-07 winter in the Juneau area, snowfall was still above the 50 year average. At Annette WSO, slightly more snow fell than in 2007-08 than the previous winter, but this was still less than the severe 1998-99 and 2001-02 winters.

The pattern of snow conditions in relation to the spatial and temporal distribution of forage can have a profound effect on deer health and survival. In contrast to 2006-07, early season snowfall in 2007-08 was actually below the 50 year average. However, extremely heavy snowfall in February likely buried forage and impeded deer movements for a time.

Although 2007-08 was not as severe as the 2006-07 winter, deer likely felt the effects more than usual due to their already weakened from the previous winter. Snowfall varies considerably among watersheds, and deer would have suffered most in areas with higher snowfall, where habitats were fragmented, and where populations were near carrying capacity. However, because snowfall returned to average numbers after February, more freeze-thaw cycles occurred than in 2006-07 (enabling deer to walk on snow crusts), and because many older and/or diseased individuals had already died the previous winter, deer survival was likely higher than during the 2006-07 winter.







February 2008: Southeast Alaska Snow Pack Data

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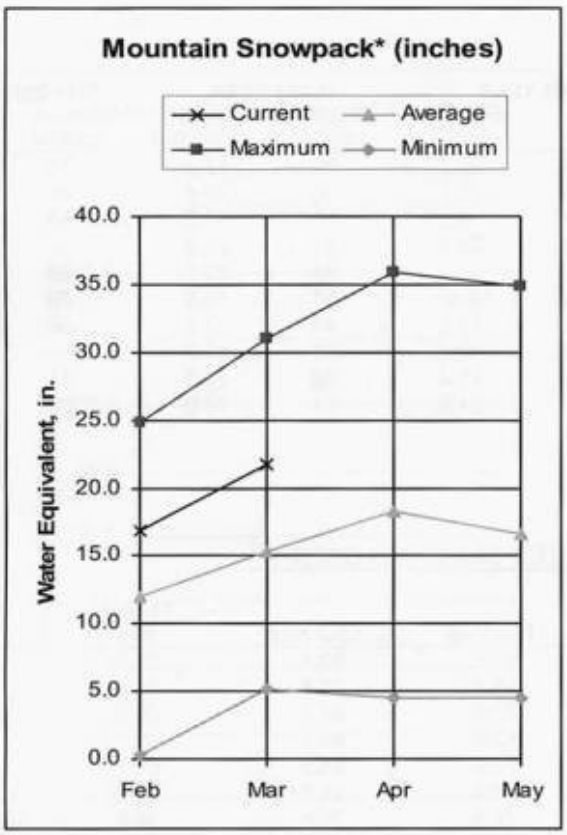
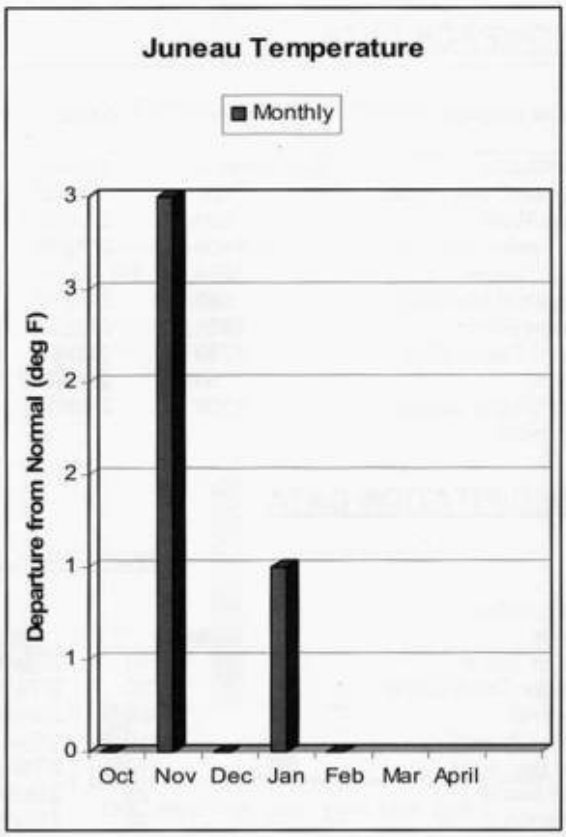
United States Department of Agriculture, National Resources Conservation Service. 2008. Alaska Snow Survey Report, February Issue. Pp 28. Full report available at website: http://www.ambcs.org

Southeast





Snowcover:

Southeast Alaska continued with its 2nd big snow year in a row. The Petersburg area is a combined 190% of average. Petersburg Ridge snow course has 110 inches of snow with 35.9 inches if water (165% of normal), whereas the lower elevation site Petersburg Reservoir has only 16.5 inches of water, but is 284% of average.

The Long Lake SNOTEL site has 122 inches of snow with 41.0 inches of water content, 128% of normal.

The Douglas Island snow courses, across from Juneau, are a combined 142% of normal.

The northern part of Southeast is in the normal range as indicated by the Moore Creek Bridge snow course north of Skagway. It has 66 inches of snow depth with 20.1 inches of snow depth and is 94% of normal.

February 2008: Southeast Alaska Snow Pack Data

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SOUTHEAST

SNOWPACK DATA

SNOW COURSE	ELEV.	DATE	THIS YEAR SNOW DEPTH	THIS YEAR WATER CONTENT	LAST YEAR SNOW DEPTH	LAST YEAR WATER CONTENT	1971-2000 AVERAGE SNOW DEPTH	1971-2000 AVERAGE WATER CONTENT
Cropley Lake	1650	2/27/08	96	34.9	124	43.5	70	23.9
Eagle Crest	1200	2/27/08	70	23.7	93	32.6	48	16.1
Fish Creek	500	2/27/08	23	6.8	48	16.9	20	6.0
Long Lake	820	3/01/08	122	41.0	126	45.2	90	32.1
Moore Creek Bridge	2250	2/29/08	66	20.1	62	18.8	62	21.3
Petersburg Reservoir	550	3/03/08	48	16.5	50	18.5	18	5.8
Petersburg Ridge	1650	2/29/08	110	35.9	142	52.8	65	21.8
Speel River	280	3/01/08	97	33.8	98	35.3	75	26.8

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	30-YR AVERAGE (1000AF)	50 PERCENTILE	% OF AVERAGE	MAX (kaf)	MIN (kaf)
Gold Creek near Juneau	Apr-Jul	33	115	133	41	32

PRECIPITATION DATA

INCHES ACCUMULATED SINCE OCTOBER 1ST

Precipitation Gauge	Elev.	Date	This Year	Last Year	71-2000 Ave	% of Average
Long Lake	820	2/29/08	81.2	84.4	85.9	94
Moore Creek Bridge	2250	No Report		24.9	23.9	---
Snettisham	25	2/29/08	90.9	94.5	95.2	96
Swan Lake	50	2/29/08	96.8	91.4	77.8	124

WATERSHED SNOWPACK ANALYSIS

REGION / RIVER BASIN	# COURSES AVERAGED	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Douglas Island	3	70	142
Snettisham	2	93	123
Petersburg	2	73	190

March 2008: Southeast Alaska Snow Pack Data

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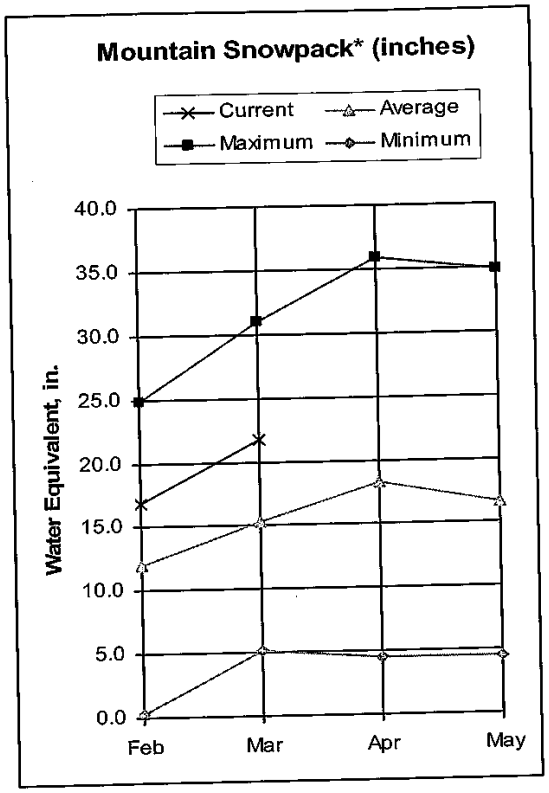
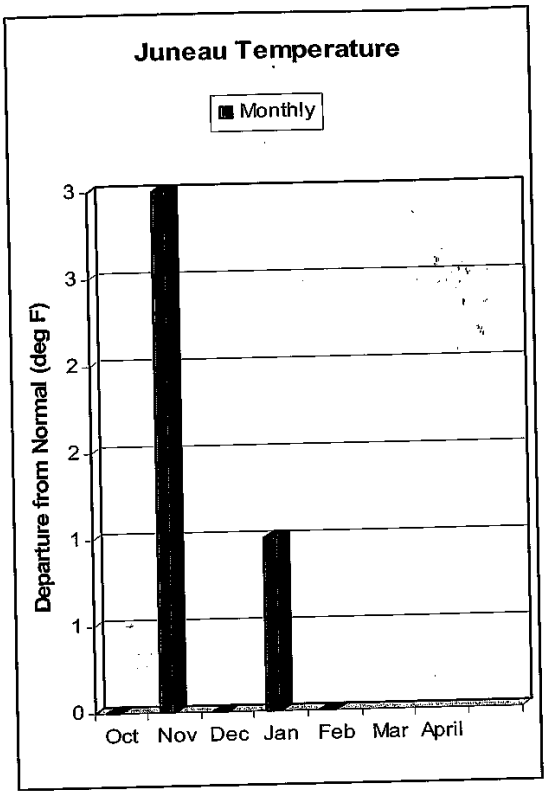
Southeast





Snowcover:

Southeast Alaska continued with its 2nd big snow year in a row. The Petersburg area is a combined 190% of average. Petersburg Ridge snow course has 110 inches of snow with 35.9 inches if water (165% of normal), whereas the lower elevation site Petersburg Reservoir has only 16.5 inches of water, but is 284% of average.

The Long Lake SNOTEL site has 122 inches of snow with 41.0 inches of water content, 128% of normal.

The Douglas Island snow courses, across from Juneau, are a combined 142% of normal.

The northern part of Southeast is in the normal range as indicated by the Moore Creek Bridge snow course north of Skagway. It has 66 inches of snow depth with 20.1 inches of snow depth and is 94% of normal.

March 2008: Southeast Alaska Snow Pack Data

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SOUTHEAST

SNOWPACK DATA

SNOW COURSE	ELEV.	DATE	THIS YEAR SNOW DEPTH	THIS YEAR WATER CONTENT	LAST YEAR SNOW DEPTH	LAST YEAR WATER CONTENT	1971-2000 AVERAGE SNOW DEPTH	1971-2000 AVERAGE WATER CONTENT
Cropley Lake	1650	2/27/08	96	34.9	124	43.5	70	23.9
Eagle Crest	1200	2/27/08	70	23.7	93	32.6	48	16.1
Fish Creek	500	2/27/08	23	6.8	48	16.9	20	6.0
Long Lake	820	3/01/08	122	41.0	126	45.2	90	32.1
Moore Creek Bridge	2250	2/29/08	66	20.1	62	18.8	62	21.3
Petersburg Reservoir	550	3/03/08	48	16.5	50	18.5	18	5.8
Petersburg Ridge	1650	2/29/08	110	35.9	142	52.8	65	21.8
Speel River	280	3/01/08	97	33.8	98	35.3	75	26.8

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	30- YR AVERAGE (1000AF)	50 PERCENTILE	% OF AVERAGE	MAX (kaf)	MIN (kaf)
Gold Creek near Juneau	Apr-Jul	33	115	133	41	32

PRECIPITATION DATA

INCHES ACCUMULATED SINCE OCTOBER 1ST

Precipitation Gauge	Elev.	Date	This Year	Last Year	71-2000 Ave	% of Average
Long Lake	820	2/29/08	81.2	84.4	85.9	94
Moore Creek Bridge	2250	No Report		24.9	23.9	---
Snettisham	25	2/29/08	90.9	94.5	95.2	96
Swan Lake	50	2/29/08	96.8	91.4	77.8	124

WATERSHED SNOWPACK ANALYSIS

REGION / RIVER BASIN	# COURSES AVERAGED	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Douglas Island	3	70	142
Snettisham	2	93	123
Petersburg	2	73	190

April 2008: Southeast Alaska Snow Pack Data

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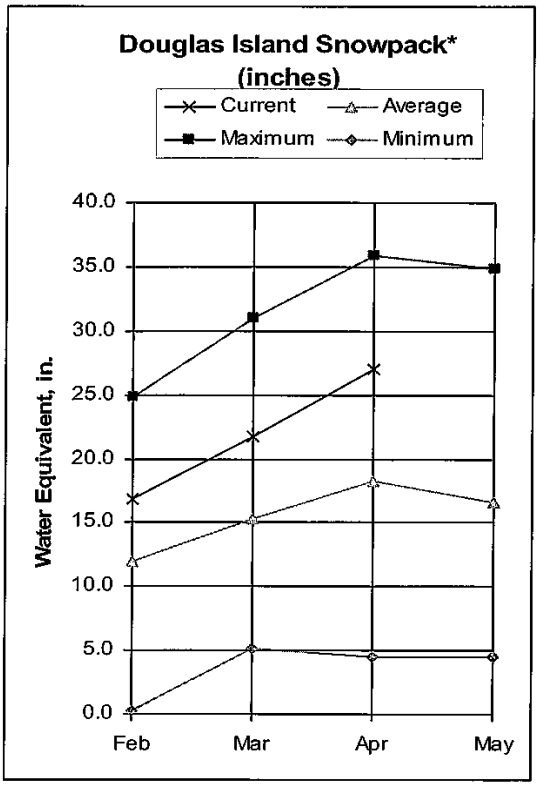
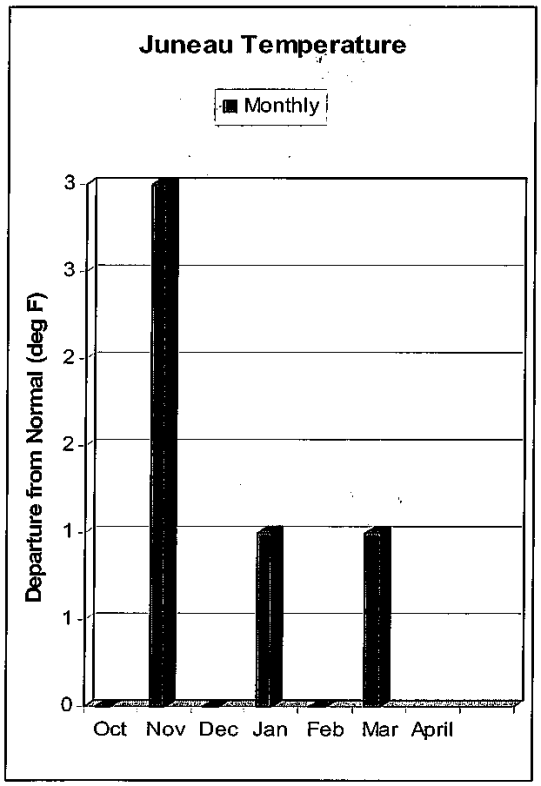
SOUTHEAST*





Snowcover:

The snow measurements recorded at the Swan Lake snow courses near Ketchikan confirmed that Southeast Alaska is having its 2nd big snow year in a row.

Lake Grace Pass has 194 inches of snow depth (16 feet) with 84.8 inches of water content. Last year there was 252 inches (21 feet) with 95.8 inches of water content. The Upper Silvas snow course topped last year's water content measurement of 87.9 inches with 225 inches of snow depth and 92.8 inches of water content this year.

The Petersburg area snow courses are also well above average at a combined 202%. Petersburg Ridge snow course has 127 inches of snow with 47.6 inches if water (180% of normal), whereas the lower elevation site Petersburg Reservoir has 18.4 inches of water, 297% of average.

The Long Lake SNOTEL site has 150 inches of snow with 53.0 inches of water content, 120% of normal.

The Douglas Island snow courses, across from Juneau, are a combined 147% of normal.

The northern part of Southeast is also largely above normal as indicated by the Moore Creek Bridge snow course north of Skagway. It has 67 inches of snow depth with 23.8 inches of snow depth and is 119% of normal.

April 2008: Southeast Alaska Snow Pack Data

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Southeast

SNOWPACK DATA

SNOW COURSE	ELEV.	DATE	THIS YEAR SNOW DEPTH	THIS YEAR WATER CONTENT	LAST YEAR SNOW DEPTH	LAST YEAR WATER CONTENT	1971-2000 AVERAGE SNOW DEPTH	1971-2000 AVERAGE WATER CONTENT
Cropley Lake	1650	3/31/08	122	42.2	147	48.4	81	30.3
Eagle Crest	1200	3/31/08	87	31.5	121	39.7	54	18.5
Fish Creek	500	3/31/08	21	7.4	60	19.7	19	6.2
Lake Grace Pass	1900	4/02/08	194	84.8	252	95.8	---	---
Long Lake	850	4/01/08	150	53.0	165	64.6	110	44.1
Lost Lake	425	4/02/08	75	28.8	97	33.5	---	---
Mint Creek Ridge	1900	4/02/08	188	76.3	200	76.0	---	---
Moore Creek Bridge	2250	3/31/08	67	23.8	75	26.4	73	20.0
Petersburg Reservoir	550	4/01/08	48	18.4	71	25.0	15	6.2
Petersburg Ridge	1650	4/01/08	127	47.6	168	58.8	71	26.4
Speel River	280	3/31/08	99	40.6	128	53.3	78	31.1
Upper Swan Lake	1700	No Survey			130	48.5	---	---
West Creek	470	3/31/08	34	12.2	New		---	---
Upper Silvas	2300	4/02/08	225	92.8	229	87.9	---	---

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	30-YR AVERAGE (1000AF)	50 PERCENTILE	% OF AVERAGE	MAX (kaf)	MIN (kaf)
Gold Creek near Juneau	Apr- Jul	33	39	118	47	31

PRECIPITATION DATA

INCHES ACCUMULATED SINCE OCTOBER 1ST

Precipitation Gauge	Elev.	Date	This Year	Last Year	71-2000 Ave	% of Average
Long Lake	850	4/01/08	94.4	96.5	96.4	98
Moore Creek Bridge	2250	3/31/08	25.3	31.0	26.8	94
Snettisham	25	3/31/08	104.7	112.7	106.8	98
Swan Lake	50	3/31/08	109.4	114.6	88.2	124

WATERSHED SNOWPACK ANALYSIS

REGION / RIVER BASIN	# COURSES AVERAGED	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Douglas Island	3	75	147
Long Lake	2	79	117
Petersburg	2	79	202
Swan Lake	3	92	229

May 2008: Southeast Alaska Snow Pack Data

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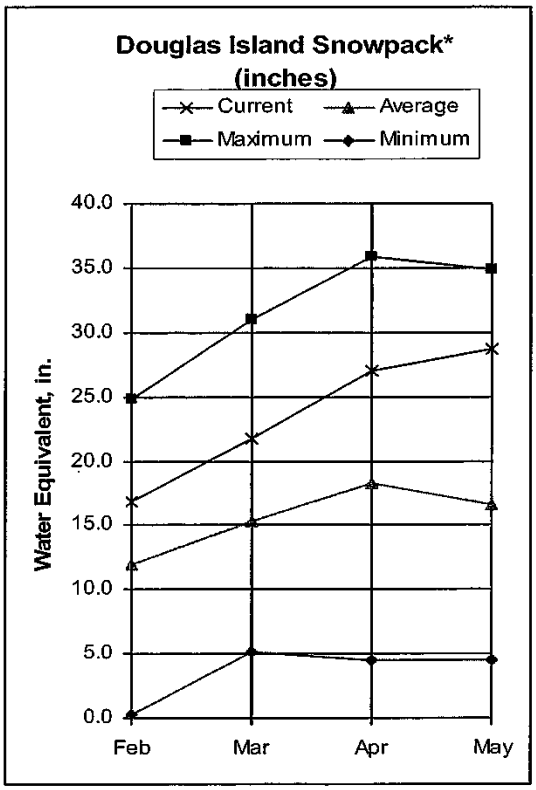
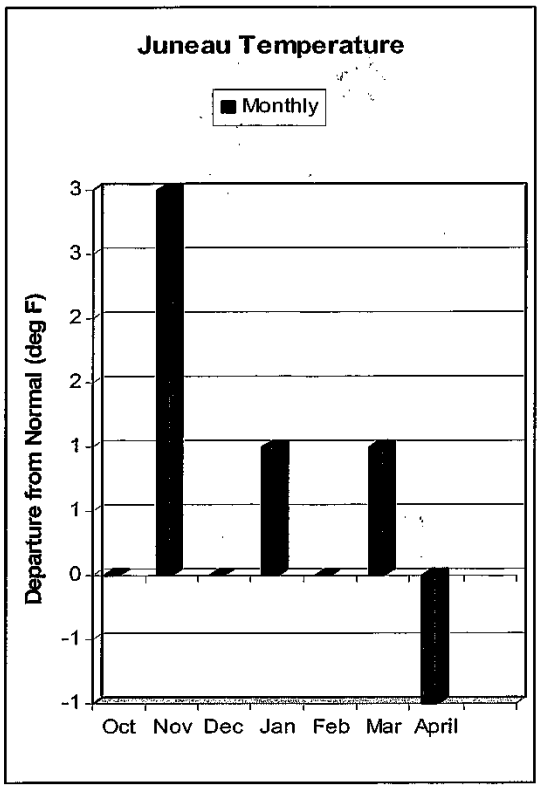
SOUTHEAST*





Snowcover:

The snow courses in Southeast Alaska continued to accumulate snow water through the month with the exception of two low elevation sites; Fish Creek on Douglas Island and Petersburg Reservoir near Petersburg. The Cropley Lake snow course above Fish Creek increased to 49.1 inches of snow water, 150% of normal. This is the 3rd highest measurement on record. The Petersburg Ridge snow course above Petersburg Reservoir increased to 51.5 inches of snow water, 233% of normal. This is the 2nd highest water content measured on record, whereas last year was the highest.

At the Snettisham Hydro-electric project, Long Lake SNOTEL site increased 7.5 inches of water content to 126% of normal. This is the 3rd highest water content measured on record, last year and 1972 being the only two higher years.

May 2008: Southeast Alaska Snow Pack Data

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Southeast

SNOWPACK DATA

Snow Course	Elev. (feet)	Date	THIS YEAR Snow Depth	THIS YEAR Water Content	LAST YEAR Snow Depth	LAST YEAR Water Content	1971-2000 AVERAGE Snow Depth	1971-2000 AVERAGE Water Content
			(inches)					
Cropley Lake	1650	4/28/08	117	49.1	---	---	73	32.8
Eagle Crest	1200	4/28/08	83	36.9	80	35.4	37	15.7
Fish Creek	500	4/28/08	0	0.0	15	7.2	3	1.3
Long Lake	850	4/30/08	129	60.5	134	64.4	100	47.9
Moore Creek Bridge	2250	4/30/08	62	24.2	61	27.2	46	18.9
Petersburg Reservoir	550	5/01/08	40	15.6	39	16.3	6	2.3
Petersburg Ridge	1650	4/30/08	114	51.5	128	59.3	51	22.1
Speel River	280	5/01/08	89	38.4	96	48.2	59	26.1

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	30-YR AVERAGE (1000AF)	50 PERCENTILE	% OF AVERAGE	MAX (kaf)	MIN (kaf)
Gold Creek near Juneau	May-Jul	31	40	19	47	33

PRECIPITATION DATA

INCHES ACCUMULATED SINCE OCTOBER 1ST

Precipitation Gauge	Elevation (feet)	Date	This Year	Last Year	1971-2000 Ave	% of Average
Long Lake	850	5/01/08	106.7	112.5	104.6	102
Moore Creek Bridge	2250	4/30/08	25.7*	36.2	26.6	97
Snettisham	25	4/30/08	121.8	122.6	112.5	108
Swan Lake	50	4/30/08	123.6	133.2	98.8	125

WATERSHED SNOWPACK ANALYSIS

Region / River Basin	No. of Courses Averaged	Percent of Last Year	Percent of Average
Douglas Island	3	92	173
Snettisham	2	88	134
Petersburg	2	89	277

Appendix 1: Pellet-Group Densities by VCU and Elevation

Analyzing the spatial distribution of pellet groups allows managers to better understand the relative use of habitat with increasing elevation. Use of different elevations is influenced by the presence of forage species as well as the availability of this forage given snow depth and conditions. In Spring 2008, the mean pellet-groups/plot in northern Southeast Alaska was highest in the lowest elevation category for almost all locations. In southern Southeast Alaska there was more variability, with considerable use of habitats in the middle elevation category in the majority of locations. The winter was likely not as severe for deer where higher elevations were heavily used.

It should be noted that the number of plots in each elevation category is not equal, which may bias results to some extent. This inequality results because not all transects are created equal: some are flatter or undulating, some start with a moderate incline and become increasingly steeper with distance from the coast, while others rise steeply from sea level. Furthermore, snow conditions usually vary from transect to transect. After a severe winter, snow often persists at higher elevations and northerly aspects. Because snow hides pellets from view, transects are terminated when snow covers greater than 50% of the plot for 3 consecutive plots.

Mean Pellet Groups (PG) Per Plot by VCU and Elevation Category, Spring 2008

		0-500 feet			501-1000 feet			>1000 feet		
VCU	Name	PG Count	# Plots	Mean	PG Count	# Plots	Mean	PG Count	# Plots	Mean
35	North Douglas	506	159	3.18	322	122	2.64	68	35	1.94
36	Inner Point	328	187	1.75	37	40	0.93	3	5	0.60
124	Shelter Island	286	261	1.10	44	47	0.94	8	13	0.62
128	Hawk Inlet	150	77	1.95	229	197	1.16	7	16	0.44
171	Hood Bay	399	256	1.56	87	38	2.29	3	7	0.43
247	Finger Mtn	515	136	3.79	144	60	2.40	2	3	0.67
298	Kelp Bay	298	163	1.83	99	45	2.20	0	0	
300	Nakwasina	333	88	3.78	145	53	2.74	48	25	1.92
305	Sea Lion Cove	175	105	1.67	54	52	1.04	0	2	0.00
368	Yakutat Isl.	829	421	1.97	0	0		0	0	
NORTHERN SOUTHEAST		**3819**	**1853**	**2.06**	**1161**	**654**	**1.78**	**139**	**106**	**1.31**
435	Castle River	29	265	0.11	4	10	0.40	0	0	
437	E. Duncan	149	176	0.85	100	38	2.63	111	48	2.31
448	Woewodski	77	71	1.08	65	63	1.03	106	101	1.05
473	Onslow	320	258	1.24	80	56	1.43	52	25	2.08
575	Thorne Lake	172	120	1.43	213	150	1.42	21	19	1.11
578	Snakey Lakes	349	253	1.38	66	23	2.87	14	24	0.58
584	Little Ratz	167	160	1.04	166	70	2.37	22	16	1.38
621	12 Mile	294	110	2.67	77	67	1.15	35	13	2.69
635	Port Refugio	358	235	1.52	142	79	1.80	22	28	0.79
758	Carroll Pt	110	89	1.24	63	33	1.91	0	0	
759	Moth Bay	130	102	1.27	109	75	1.45	10	14	0.71
765	Dall Head	145	248	0.58	10	26	0.38	0	6	0.00
767	Duke Isl	46	291	0.16	0	0		0	0	
769	Alava Bay	280	211	1.33	66	78	0.85	29	41	0.71
SOUTHERN SOUTHEAST		**2626**	**2589**	**1.01**	**1161**	**768**	**1.51**	**422**	**335**	**1.26**
ALL SOUTHEAST ALASKA		**6445**	**4442**	**1.45**	**2322**	**1422**	**1.63**	**561**	**441**	**1.27**

Appendix 2: Pellet-Group Densities by VCU and Transect

Pellet-Groups Per Plot by VCU and Transect, Spring 2008

VCU	Name	Transect	Pellet Groups (PG)	Plots	Mean PG/ Plot	Lower 95% C. I.	Upper 95% C. I.
35	North Douglas	1	126	52	2.42	1.47	3.38
35	North Douglas	2	363	70	5.19	4.23	6.15
35	North Douglas	3	150	71	2.11	1.65	2.58
35	North Douglas	4	257	123	2.09	1.70	2.48
35	North Douglas	Total	896	316	2.84	2.49	3.19
36	Inner Point	1	59	49	1.20	0.68	1.73
36	Inner Point	2	191	125	1.53	1.16	1.90
36	Inner Point	3	118	58	2.03	1.47	2.60
36	Inner Point	Total	368	232	1.59	1.32	1.85
124	Shelter Island	4	68	50	1.36	0.97	1.75
124	Shelter Island	5	21	40	0.53	0.28	0.77
124	Shelter Island	6	45	51	0.88	0.59	1.18
124	Shelter Island	7	62	50	1.24	0.73	1.75
124	Shelter Island	8	67	50	1.34	0.82	1.86
124	Shelter Island	18	75	80	0.94	0.70	1.18
124	Shelter Island	Total	338	321	1.05	0.90	1.21
128	Hawk Inlet	1	83	125	0.66	0.47	0.86
128	Hawk Inlet	2	125	64	1.95	1.33	2.58
128	Hawk Inlet	3	178	101	1.76	1.40	2.12
128	Hawk Inlet	Total	386	290	1.33	1.12	1.55
171	Hood Bay	1	120	97	1.24	0.81	1.66
171	Hood Bay	2	228	79	2.89	2.31	3.46
171	Hood Bay	3	141	125	1.13	0.80	1.45
171	Hood Bay	Total 4	89	301	1.62	1.37	1.88

Appendix 2: Pellet-Group Densities by VCU and Transect

Pellet-Groups Per Plot by VCU and Transect, Spring 2008

VCU	Name	Transect	Pellet Groups (PG)	Plots	Mean PG/ Plot	Lower 95% C. I.	Upper 95% C. I.
247	Finger Mountain	1	58	34	1.71	0.97	2.44
247	Finger Mountain	2	514	125	4.11	3.50	4.72
247	Finger Mountain	3	89	40	2.23	1.43	3.02
247	Finger Mountain	Total	661	199	3.32	2.87	3.78
298	M. Arm Kelp Bay	2	166	103	1.61	1.28	1.94
298	M. Arm Kelp Bay	3	82	38	2.16	1.56	2.76
298	M. Arm Kelp Bay	4	149	67	2.22	1.60	2.84
298	M. Arm Kelp Bay	Total	397	208	1.91	1.63	2.19
300	Nakwasina	2	74	34	2.18	1.33	3.03
300	Nakwasina	3	128	65	1.97	1.52	2.42
300	Nakwasina	8	324	67	4.84	3.85	5.83
300	Nakwasina	Total	526	166	3.17	2.66	3.68
305	Sea Lion Cove	1	59	43	1.37	0.86	1.88
305	Sea Lion Cove	2	142	88	1.61	1.18	2.05
305	Sea Lion Cove	3	28	28	1.00	0.53	1.47
305	Sea Lion Cove	Total	229	159	1.44	1.15	1.73
368	Yakutat Islands	1 (Khantaak)	144	85	1.69	1.31	2.08
368	Yakutat Islands	1 (Kriwoi)	75	58	1.29	0.93	1.66
368	Yakutat Islands	2 (Khantaak)	309	123	2.51	2.04	2.99
368	Yakutat Islands	2 (Kriwoi)	116	58	2.00	1.47	2.53
368	Yakutat Islands	3 (Dolgoi)	117	52	2.25	1.66	2.84
368	Yakutat Islands	4 (Dolgoi)	68	45	1.51	0.99	2.03
368	Yakutat Islands	Total	829	421	1.97	1.76	2.18
435	Castle River	1	14	97	0.14	0.06	0.23

Appendix 2: Pellet-Group Densities by VCU and Transect

Pellet-Groups Per Plot by VCU and Transect, Spring 2008

VCU	Name	Transect	Pellet Groups (PG)	Plots	Mean PG/ Plot	Lower 95% C. I.	Upper 95% C. I.
435	Castle River	2	9	70	0.13	0.01	0.25
435	Castle River	3	10	108	0.09	0.04	0.15
435	Castle River	Total	33	275	0.12	0.07	0.17
437	E. Duncan	1	35	109	0.32	0.19	0.45
437	E. Duncan	2	240	74	3.24	2.54	3.95
437	E. Duncan	3	85	79	1.08	0.69	1.46
437	E. Duncan	Total	360	262	1.37	1.10	1.65
448	Woewodski	1	114	83	1.37	0.94	1.80
448	Woewodski	2	88	73	1.21	0.74	1.68
448	Woewodski	3	46	79	0.58	0.35	0.81
448	Woewodski	Total	248	235	1.06	0.83	1.28
473	Onslow	1	55	103	0.53	0.35	0.71
473	Onslow	2	221	125	1.77	1.39	2.14
473	Onslow	3	176	111	1.59	1.21	1.96
473	Onslow	Total	452	339	1.33	1.13	1.53
575	Thorne Lake	1	147	77	1.91	1.44	2.37
575	Thorne Lake	2	138	94	1.47	1.04	1.90
575	Thorne Lake	3	92	86	1.07	0.77	1.37
575	Thorne Lake	4	29	32	0.91	0.58	1.23
575	Thorne Lake	Total	406	289	1.40	1.19	1.62
578	Snakey Lakes	5	90	102	0.88	0.61	1.15
578	Snakey Lakes	6	215	125	1.72	1.39	2.05
578	Snakey Lakes	7	124	73	1.70	1.23	2.17
578	Snakey Lakes	Total	429	300	1.43	1.22	1.64

Appendix 2: Pellet-Group Densities by VCU and Transect

Pellet-Groups Per Plot by VCU and Transect, Spring 2008

VCU	Name	Transect	Pellet Groups (PG)	Plots	Mean PG/ Plot	Lower 95% C. I.	Upper 95% C. I.
584	Little Ratz	1	102	89	1.15	0.79	1.50
584	Little Ratz	2	57	61	0.93	0.60	1.27
584	Little Ratz	3	100	47	2.13	1.42	2.84
584	Little Ratz	4	96	49	1.96	1.24	2.68
584	Little Ratz	Total	355	246	1.44	1.19	1.70
621	12 Mile	1	156	85	1.84	1.43	2.24
621	12 Mile	2	151	50	3.02	1.87	4.17
621	12 Mile	3	99	55	1.80	1.33	2.27
621	12 Mile	Total	406	190	2.14	1.75	2.52
635	Port Refugio	1	161	125	1.29	0.99	1.59
635	Port Refugio	2	162	92	1.76	1.33	2.19
635	Port Refugio	3	199	125	1.59	1.26	1.93
635	Port Refugio	Total	522	342	1.53	1.33	1.73
758	Carroll Pt.	28	173	122	1.42	1.00	1.83
758	Carroll Pt.	Total	173	122	1.42	1.00	1.83
759	Moth Bay	2	129	101	1.28	0.95	1.61
759	Moth Bay	3	120	90	1.33	1.04	1.63
759	Moth Bay	Total	249	191	1.30	1.08	1.53
765	Dall Head	1	84	105	0.80	0.59	1.01
765	Dall Head	2	30	84	0.36	0.19	0.52
765	Dall Head	3	41	91	0.45	0.04	0.86
765	Dall Head	Total	155	280	0.55	0.39	0.72
767	Duke Island	1	7	96	0.07	-0.01	0.15
767	Duke Island	2	30	100	0.30	0.14	0.46

Appendix 2: Pellet-Group Densities by VCU and Transect

Pellet-Groups Per Plot by VCU and Transect, Spring 2008

VCU	Name	Transect	Pellet Groups (PG)	Plots	Mean PG/ Plot	Lower 95% C. I.	Upper 95% C. I.
767	Duke Island	3	9	95	0.09	0.02	0.17
767	Duke Island	Total	46	291	0.16	0.09	0.22
769	Alava Bay	1	152	120	1.27	0.93	1.60
769	Alava Bay	2	151	122	1.24	0.91	1.56
769	Alava Bay	3	72	88	0.82	0.55	1.08
769	Alava Bay	Total	375	330	1.14	0.95	1.32

Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL*	Year	Plots	Pellet-Group Mean	95%C.I.
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
				1993	324	0.74	0.62-0.87
				1994	315	0.91	0.74-1.09
				1995	306	0.86	0.70-1.02
				1996	323	0.97	0.81-1.12
				1997	323	1.43	1.24-1.62
				1998	321	1.54	1.32-1.77
				1999	273	1.03	0.86-1.19
				2000	282	0.88	0.71-1.04
				2001	335	1.01	0.85-1.17
				2002	200	0.68	0.50-0.85
				2003	267	0.93	0.77-1.09
				2004	288	1.52	1.28-1.76
				2005	151	2.08	1.61-2.54
				2006	263	2.02	1.74-2.29
				2007	165	2.28	1.83-2.73
				2008	316	2.84	2.49-3.19
36	Inner Point	3,965	44%	1985	256	1.30	1.10-1.51
				1986	235	1.97	1.68-2.25
				1987	262	1.76	1.53-2.00
				1988	200	1.21	1.02-1.39
				1989	258	1.31	1.08-1.53
				1992	204	2.05	1.75-2.36
				1995	254	1.41	1.21-1.60
				1996	240	1.68	1.45-1.91
				1997	252	2.36	.08-2.64
				1998	280	0.84	0.69-0.98
				1999	239	1.06	0.87-1.25
				2000	280	1.09	0.90-1.28
				2002	198	0.82	0.64-1.00
				2003	272	0.76	0.60-0.92
				2004	242	0.88	0.68-1.08
				2006	147	2.33	1.93-2.72
				2007	182	2.10	1.70-2.50
				2008	**232**	**1.59**	**1.32-1.85**
38	Rhine Creek	6,357	2%	1997	108	0.31	0.14-0.47

*CFL = commercial forest land, or volume classes 4-7 (currently referred to as productive forest land, or "PFL"). Numbers are from the 1980's, and should be updated.

Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
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
				1985	774	1.82	1.67-1.97
				1986	727	2.20	2.02-2.37
124	Shelter Island (Trans. 4-8, 18)			1984	300	1.52	1.34-1.70
				1985	296	2.52	2.24-2.81
				1986	292	3.24	2.91-3.57
				1987	288	2.91	2.57-3.24
				1988	130	3.16	2.62-3.70
				1989	300	1.43	1.23-1.62
				1990	300	1.60	1.37-1.82
				1993	250	2.00	1.73-2.26
				1995	297	1.38	1.20-1.56
				1997	312	2.51	2.23-2.78
				1999	290	1.63	1.42-1.85
				2001	231	2.07	1.79-2.36
				2003	300	1.41	1.19-1.63
				2005	200	1.86	1.59-2.13
				2007	321	1.10	0.97-1.41
				2008	321	1.05	0.90-1.21
124	Lincoln Island			1998	207	1.52	1.27-1.77
				2007	213	0.84	0.62-1.06
125	Barlow Cove	13,712	24%	1982	2,567	1.07	1.01-1.12
				1984	347	1.69	1.46-1.92
				1985	347	1.55	1.35-1.76
				1990	270	1.42	1.18-1.65

*CFL = commercial forest land, or volume classes 4-7 (currently referred to as productive forest land, or "PFL"). Numbers are from the 1980's, and should be updated.

Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
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
				1984	339	1.42	1.22-1.63
				1985	270	1.69	1.43-1.95
				1986	286	1.92	1.64-2.19
				1987	278	2.54	2.19-2.89
				1989	364	1.82	1.56-2.08
				1990	250	2.24	1.94-2.53
				1992	319	1.61	1.38-1.83
				1996	325	1.26	1.07-1.46
				1999	176	1.25	1.00-1.50
				2002	183	1.17	0.93-1.42
				2005	322	2.69	2.30-3.08
				2007	305	1.19	0.97-1.41
				2008	290	1.33	112-1.55
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
				1989	283	2.04	1.75-2.32
				1994	282	2.27	1.98-2.56
				1998	308	2.13	1.87-2.38
171	Hood Bay	44,355	79%	1987	358	2.31	1.99-2.63
				1989	366	1.77	1.54-2.00
				1990	375	1.85	1.61-2.09
				1992	360	1.91	1.64-2.18
				1994	371	1.64	1.41-1.88
				2000	349	1.04	0.87-1.21
				2003	220	1.41	1.17-1.65
				2006	355	2.76	2.5-3.02
				2008	301	1.62	1.37-1.88

*CFL = commercial forest land, or volume classes 4-7 (currently referred to as productive forest land, or "PFL"). Numbers are from the 1980's, and should be updated.

Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
182	Pybus Bay	41,501	62%	1981	390	1.34	1.16-1.52
				1984	300	1.02	0.86-1.18
				1985	269	1.86	1.60-2.12
				1986	235	2.00	1.70-2.29
				1987	242	2.03	1.69-2.37
				1989	199	2.00	1.63-2.36
				1990	221	1.72	1.44-2.01
				1992	236	1.13	0.97-1.30
				1995	205	1.48	1.23-1.74
				1998	256	1.37	1.16-1.59
185	Pleasant Island	8,738	16%	1991	311	1.38	1.18-1.57
				1992	210	1.34	1.09-1.59
				1993	305	1.77	1.52-2.02
				1994	356	1.22	1.04-1.40
				1997	300	1.80	1.54-2.06
				1999	223	1.82	1.55-2.08
				2002	351	1.96	1.71-2.20
				2005	312	1.33	1.11-1.55
189	Port Althorp	8,040	27%	1988	195	1.80	1.47-2.13
				1991	223	1.92	1.55-2.29
				1992	261	1.36	1.11-1.60
				1993	248	1.39	1.15-1.62
				1994	253	1.31	1.06-1.56
				1998	281	1.48	1.27-1.70
				2001	225	1.81	1.49-2.13
190	Idaho Inlet	53,183	22%	1988	258	1.34	1.09-1.60
				1992	219	0.94	0.69-1.19
				1993	305	0.56	0.45-0.68
				1994	294	0.71	0.58-0.84
				1998	273	1.11	0.92-1.30
				2001	308	0.94	0.78-1.11
				2004	296	1.05	0.85-1.25
202	Port Frederick	16,619	52%	1988	242	1.87	1.62-2.13
				1996	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
				1992	271	1.13	0.94-1.33

*CFL = commercial forest land, or volume classes 4-7 (currently referred to as productive forest land, or "PFL"). Numbers are from the 1980's, and should be updated.

Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				1993	265	0.73	0.58-0.88
				1994	272	1.05	0.81-1.29
				1996	276	0.98	0.77-1.18
				1997	263	1.50	1.23-1.77
				1999	112	1.02	0.69-1.34
				2002	218	1.32	1.03-1.60
				2005	329	1.46	1.25-1.66
211	Point Augusta	4,688	63%	1983	757	1.78	1.62-2.01
				1993	286	2.08	1.80-2.36
				1997	234	3.30	2.90-3.70
218	Pavlof River	18,866	50%	1988	325	1.78	1.50-2.06
				1992	341	1.56	1.32-1.81
				1996	349	1.50	1.30-1.70
				1997	313	1.71	1.47-1.94
				1999	213	2.24	1.83-2.67
				2002	249	2.48	2.10-2.87
				2005	323	2.30	2.06-2.55
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
				1992	265	0.58	0.47-0.70
				1993	249	0.47	0.36-0.58
				1994	319	0.61	0.48-0.74
				1996	263	0.56	0.38-0.75
231	Saltery Bay	18,478	31%	1988	256	2.02	1.69-2.35
				1992	256	0.96	0.79-1.14
				1993	227	0.76	0.56-0.96
				1994	193	0.97	0.79-1.15
				1996	152	1.90	1.47-2.33
				1997	170	1.99	1.59-2.39
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
				1988	221	2.67	2.18-3.16

*CFL = commercial forest land, or volume classes 4-7 (currently referred to as productive forest land, or "PFL"). Numbers are from the 1980's, and should be updated.

Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				1992	282	1.62	1.38-1.86
				1993	385	1.12	0.95-1.30
				1994	294	1.39	1.18-1.60
				1995	195	2.64	2.20-3.07
				1996	204	2.36	1.96-2.76
236	Corner Bay	10,930	66%	1981	60	0.35	0.17-0.53
				1992	206	2.27	1.91-2.64
				1993	50	1.72	1.25-2.19
				1994	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
				1984	302	1.83	1.57-2.09
				1985	279	3.23	2.79-3.67
				1986	277	2.88	2.57-3.19
				1987	236	3.11	2.71-3.52
				1989	305	2.99	2.57-3.40
				1990	225	3.36	2.99-3.74
				1991	150	3.93	3.36-4.51
				1992	207	2.85	2.48-3.22
				1993	179	3.03	2.60-3.47
				1994	275	2.29	1.96-2.62
				1996	221	2.62	2.20-3.04
				1997	227	3.53	3.05-4.02
				1999	169	3.04	2.59-3.50
				2000	217	2.87	2.45-3.30
				2002	162	2.99	2.37-3.60
				2004	229	3.03	2.67-3.39
				2005	299	2.79	2.45-3.13
				2006	280	2.58	2.24-2.92
				2007	248	1.89	1.65-2.13
				2008	199	3.32	2.87-3.78
249	Lisianski	19,677	24%	1988	255	0.97	0.79-1.14
				1991	170	1.53	1.22-1.84
				1995	317	0.70	0.56-0.85
				1998	321	0.88	0.75-1.02
254	Soapstone	17,695	29%	1988	274	1.92	1.67-2.17
				1991	270	2.05	1.77-2.33
				1993	243	1.88	1.59-2.16
				1994	310	1.34	1.16-1.52

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				1995	283	1.48	1.27-1.69
				2001	246	1.95	1.65-2.25
271	Chichagof (Klag Bay)	20,680	10%	1991	301	1.39	1.19-1.58
				1995	303	0.98	0.83-1.14
				1998	319	1.34	1.16-1.53
				2001	291	1.23	1.04-1.43
				2004	303	1.15	0.99-1.31
				2007	275	0.81	0.67-0.95
275	Cobol	14,618	49%	1984	224	1.15	0.92-1.37
				1991	185	2.96	2.37-3.54
				1995	218	1.45	1.16-1.74
				1998	219	2.19	1.86-2.51
				2001	180	1.94	1.59-2.30
				2004	232	2.97	2.48-3.46
				2007	176	2.13	1.69-2.56
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
				1984	303	0.71	0.61-0.92
				1985	224	1.32	1.02-1.62
				1997	353	1.44	1.21-1.67
				2003	355	1.65	1.43-1.87
				2006	359	1.82	1.57-2.06
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
				1990	214	3.09	2.70-3.48
				1997	39	1.59	0.86-2.32
				2003	103	2.77	2.28-3.26
298	M. Arm Kelp Bay	28,424	21%	1990	306	2.68	2.35-3.01
				1997	100	2.67	2.04-3.30
				2003	140	1.41	1.12-1.70
				2006	248	2.10	1.83-2.38

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
300	Nakwasina (All Transects)	19,575	48%	1984	196	2.51	2.14-2.88
				1985	1046	3.92	3.67-4.17
				1986	715	3.50	3.26-3.76
300	Nakwasina (Trans. 2,3,8)	19,575	48%	1984	138	2.51	2.10-2.93
				1985	218	3.65	3.13-4.17
				1986	205	3.38	2.91-3.84
				1987	195	2.31	1.90-2.71
				1989	244	2.32	2.00-2.65
				1990	255	2.98	2.56-3.40
				1991	175	3.98	3.39-4.57
				1992	223	1.64	1.37-1.90
				1993	188	3.15	2.70-3.60
				1994	230	1.46	1.24-1.68
				1995	216	1.75	1.48-2.10
				1996	210	2.82	2.35-3.29
				1997	188	2.79	2.31-3.27
				1998	217	2.99	2.48-3.49
				1999	146	3.20	2.64-3.76
				2000	181	2.64	2.23-3.05
				2001	186	2.33	1.91-2.75
				2002	132	2.35	1.90-2.80
				2003	221	3.09	2.68-3.50
				2004	211	3.36	3.02-3.70
				2005	254	2.22	1.91-2.52
				2006	205	3.91	3.42-4.40
				2007	167	3.40	2.90-3.89
				2008	166	3.17	2.66-3.68
305	Sea Lion Cove (Kalinin Bay)	9,293	69%	1984	320	1.36	1.15-1.58
				1985	292	2.57	2.23-2.91
				1986	235	2.87	2.44-3.29
				1987	226	3.31	2.82-3.80
				1989	303	1.75	1.50-2.00
				1990	227	2.03	1.71-2.35
				1991	219	1.63	1.36-1.91
				1992	239	1.30	1.08-1.51
				1993	198	1.70	1.38-2.02
				1994	221	1.29	1.09-1.48
				1995	210	1.30	1.08-1.52
				1996	225	1.63	1.35-1.90
				1997	223	1.76	1.43-2.10
				1998	241	1.71	1.44-1.99

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				2000	201	1.42	1.09-1.76
				2001	231	1.40	1.14-1.66
				2002	119	2.01	1.60-2.41
				2003	249	1.90	1.55-2.25
				2004	206	1.13	0.90-1.36
				2005	252	1.40	1.20-1.61
				2006	245	1.41	1.18-1.65
				2007	221	0.95	0.73-1.16
				2008	159	1.44	1.15-1.73
308	South Kruzof	71,158	25%	1993	345	1.62	1.41-1.83
				1994	370	1.71	1.52-1.90
				1999	365	1.38	1.16-1.58
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
				2000	270	1.26	1.02-1.49
				2003	221	1.56	1.31-1.81
344	Whale Bay	na	na	2000	260	1.40	1.17-1.62
				2003	279	1.70	1.43-1.97
348	West Crawfish	57,434	16%	1989	360	1.35	1.36-1.57
				2000	211	1.34	1.07-1.61
				2003	313	1.31	1.07-1.55
361	Knight Island	10,419	40%	1991	100	0.81	0.61-1.01
				1992	100	0.95	0.74-1.16
				1994	90	0.44	0.25-0.64
				1996	153	0.00	0.00-0.00
				1997	192	0.03	0.01-0.05
				2003	117	0.22	not avail
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

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				1992	243	0.48	0.37-0.58
				1993	106	1.07	0.81-1.32
				1994	251	0.66	0.52-0.80
				1996	379	0.59	0.48-0.69
				1997	344	0.59	0.48-0.70
				2000	145	0.90	0.85-0.95
				2002	200	0.66	not avail
				2003	325	0.58	not avail
				2004	274	0.86	not avail
				2008	421	1.97	1.76-2.18
369	Ankau	na	na	1991	116	0.03	0.00-0.05
400	Security Bay	28,040	79%	1984	360	0.02	0.01-0.04
				1989	304	0.25	0.16-0.34
				1995	268	0.22	0.15-0.29
				2000	200	0.09	0.05-0.14
403	Pillar Bay	28,227	65%	1988	337	0.16	0.10-0.22
				2000	265	0.18	0.13-0.23
408	Malmesbury	18,151	68%	1990	206	0.11	0.05-0.18
				2000	254	0.06	0.03-0.09
417	Conclusion Island	12,561	99%	1987	207	2.66	2.32-3.01
				1989	200	0.95	0.72-1.18
				1991	200	0.71	0.53-0.88
				1996	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
				1993	375	0.77	0.64-0.90
434a	Big Level Island	727	61%	1981	399	1.54	1.45-1.63
				1983	336	1.56	
				1986	382	1.66	1.41-1.90
				1989	227	1.07	

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				1991	456	2.16	1.90-2.41
				1999	427	2.00	1.74-2.26
434b	Little Level Island	263	92%	1981	114	2.48	2.02-2.94
				1983	136	2.34	
				1986	122	1.39	1.07-1.70
				1989	137	1.52	
				1991	132	3.59	3.07-4.11
				1999	123	2.84	2.28-3.40
435	Castle River	32,724	36%	1984	312	0.19	0.12-0.26
				1987	305	0.51	0.37-0.65
				1989	312	0.40	0.25-0.56
				1994	310	0.32	0.24-0.40
				1998	281	0.36	0.28-0.44
				2008	275	0.12	0.07-0.17
437	E. Duncan	23,744	55%	1990	227	1.12	0.92-1.32
				1992	213	0.78	0.63-0.94
				1998	153	1.04	0.77-1.30
				2002	254	1.89	1.59-2.19
				2008	262	1.37	1.10-1.65
442	Portage Bay	11,269	49%	1993	282	0.43	0.31-0.56
				1995	277	0.43	0.33-0.53
				1998	285	0.39	0.29-0.49
448	Woewodski (Mitkof)	20,931	53%	1984	295	0.88	0.69-1.08
				1985	209	1.00	0.82-1.19
				1987	195	1.65	1.85-2.61
				1988	433	1.33	1.16-1.51
				1989	417	1.35	1.24-1.73
				1990	355	1.46	1.28-1.64
				1991	316	1.80	1.52-2.07
				1992	248	0.79	0.62-0.97
				1993	230	1.06	0.85-1.27
				1994	152	1.14	0.82-1.46
				1995	157	1.38	1.08-1.67
				1996	243	2.25	1.95-2.55
				1997	282	1.56	1.27-1.84
				1998	282	1.10	0.91-1.29
				1999	196	1.36	1.11-1.60
				2000	226	1.27	1.05-1.50

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				2002	220	1.43	1.17-1.68
				2003	216	0.50	0.36-0.64
				2004	250	1.06	0.87-1.25
				2005	279	0.82	0.65-0.98
				2007	180	1.63	1.26-2.00
				2008	235	1.06	0.83-1.28
448a	Woewodski Island	20,931	53%	1991	461	1.86	1.66-2.05
				1994	510	1.30	1.15-1.46
449	Frederick	6,835	70%	1981	945	0.08	0.06-0.11
				1990	180	0.55	0.36-0.74
				1992	227	0.54	0.42-0.65
452	Blind Slough	30,655	55%	1990	324	1.35	1.15-1.56
				1992	114	1.04	0.77-1.30
				1993	265	1.28	1.04-1.51
				1997	245	1.61	1.34-1.88
454	Dry	11,033	74%	1981	91	0.92	0.56-1.28
				1993	210	1.44	1.17-1.72
				1997	188	1.26	0.88-1.39
455	Vank	8,437	99%				
	a) Sokolof			1981	900	1.73	1.61-1.85
				1999	360	0.92	0.76-1.08
	b) Rynda			1981	281	0.25	0.18-0.32
				1999	280	0.27	0.18-0.36
	c) Greys			1981	284	0.25	0.18-0.32
456	Baht	16,972	69%	2002	109	2.75	2.10-3.41
				2004	108	1.80	1.45-2.15
				2005	101	2.12	1.73-2.51
				2007	108	1.51	1.14-1.88

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
457	St. John	26,112	53%	2002	220	1.65	1.38-1.93
				2004	229	1.17	0.96-1.38
				2005	213	1.75	1.44-2.03
				2007	211	1.98	1.65-2.31
458	Snow Passage	31,572	46%	1994	345	0.58	0.45-0.70
				1997	315	0.98	0.80-1.16
				2002	280	1.50	1.28-1.72
				2004	306	1.02	0.84-1.20
				2005	262	1.08	0.89-1.27
				2007	289	1.52	1.26-1.78
459	Meter	42,438	46%	2002	180	0.87	0.64-1.10
				2004	180	0.89	0.68-1.10
				2005	155	1.41	1.75-1.07
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
				1987	201	2.23	1.85-2.61
				1989	223	2.52	2.18-2.85
				1991	203	1.59	1.32-1.85
				1993	225	0.22	0.13-0.31
				1994	224	0.26	0.18-0.34
				1999	216	0.11	0.06-0.17
				2004	227	0.08	0.03-0.13
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
				1985	334	0.59	0.48-0.70
				1986	347	0.72	0.59-0.84
				1987	336	0.42	0.31-0.55
				1988	329	0.44	0.32-0.55
				1991	322	0.66	0.51-0.80
				1993	341	0.68	0.55-0.82
				1994	340	0.88	0.74-1.02
				1997	346	0.73	0.59-0.86
				2002	332	0.97	0.81-1.13
				2006	363	0.60	0.48-0.71

*CFL = commercial forest land, or volume classes 4-7 (currently referred to as productive forest land, or "PFL"). Numbers are from the 1980's, and should be updated.

Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				2008	339	1.33	1.13-1.53
474	Fisherman's Cove (Canoe)			2001	228	0.11	0.06-0.17
480	Fools Inlet	30,906	44%	1994	194	0.54	0.38-0.70
				2001	201	0.61	0.45-0.77
489	Muddy River	40,275	37%	1996	348	1.53	1.26-1.80
490	Horn	9,815	55%	1998	250	0.60	0.47-0.74
				2003	290	0.67	0.53-0.81
504	Madan	na	60%	2001	244	0.23	0.14-0.31
511	Harding	na	20%	2001	207	0.02	0.00-0.05
524	Frosty Bay	17,959	41%	1991	266	0.70	0.55-0.86
527	Protection	6,257	100%	1997	332	1.15	0.99-1.30
				1998	281	0.59	0.47-0.71
				2000	325	0.56	0.46-0.66
				2002	349	0.70	0.56-0.83
				2003	319	0.69	0.53-0.85
528	Mt. Calder	9,232	83%	1988	252	2.14	1.78-2.49
				1997	272	1.17	0.96-1.39
				1999	165	0.48	0.31-0.62
532	Red Bay	15,145	66%	1987	177	0.32	0.18-0.47
				1994	256	0.94	0.74-1.14
				1996	281	1.19	0.97-1.41
				1997	248	1.07	0.89-1.25
				1998	283	0.73	0.59-0.88
				2001	337	0.76	0.61-0.90
				2002	289	1.49	1.28-1.71
				2003	314	1.15	0.94-1.34
				2004	315	0.85	0.68-1.02
				2006	295	1.54	1.31-1.78
539	Exchange Cove	10,406	74%	1988	266	1.39	1.15-1.64

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				1992	125	1.10	0.83-1.38
				1997	303	1.25	1.04-1.46
549	Sarheen	11,875	52%	1989	310	1.73	1.44-2.01
				1996	334	1.00	0.83-1.16
				1997	330	1.00	0.85-1.14
				1998	355	0.42	0.33-0.51
				1999	284	0.64	0.51-0.78
				2000	293	0.98	0.78-1.17
				2001	319	0.45	0.36-0.55
				2002	263	0.69	0.54-0.83
				2005	257	0.78	0.64-0.93
554	Sarkar	32,183	60%	1988	298	1.28	1.06-1.50
				1992	125	1.10	0.83-1.38
				1994	292	0.92	0.77-1.07
				1997	263	0.61	0.48-0.74
				1998	312	0.29	0.21-0.37
				1999	281	0.74	0.60-0.88
				2001	330	0.45	0.35-0.55
				2002	283	0.76	0.62-0.90
				2003	333	0.50	0.38-0.62
				2004	340	0.61	0.51-0.71
561	Warm Chuck	12,348	85%	1984	326	1.02	1.02-1.38
				1985	295	1.60	1.36-1.84
				1989	302	2.21	1.91-2.50
				1991	291	2.05	1.73-2.37
				1996	276	1.39	1.17-1.61
				1997	247	1.21	1.01-1.41
				1998	246	1.29	1.08-1.51
				2000	288	0.99	0.81-1.16
				2002	221	1.17	0.94-1.39
				2006	277	1.23	1.01-1.45
564	Coronation	19,107	69%	1983	696	1.20	1.04-1.36
				1985	228	2.34	
				1988	408	1.41	1.17-1.66
				1989	293	1.63	1.28-1.98
				1997	289	0.44	0.34-0.55
				2001	336	0.85	0.67-1.03
569	Baker	31,802	68%	1991	256	0.08	0.04-0.12

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	Pellet-Group 95%C.I.
				1997	250	0.14	0.08-0.20
575	Thorne Lake	17,970	68%	1992	334	1.20	1.03-1.37
				1994	293	0.76	0.62-0.91
				1995	299	1.27	1.09-1.45
				1997	303	0.84	0.66-0.96
				1998	316	0.87	0.71-1.03
				1999	231	1.02	0.83-1.21
				2000	311	1.28	1.06-1.51
				2001	327	0.53	0.42-0.63
				2002	284	1.12	0.90-1.35
				2003	123	0.91	0.66-1.16
				2004	218	0.94	0.75-1.13
				2005	287	0.94	0.79-1.10
				2006	287	1.04	0.89-1.20
				2007	204	1.84	1.54-2.15
				2008	289	1.40	1.19-1.62
578	Snakey Lakes	6,431	84%	1986	279	0.62	0.51-0.73
				1988	300	1.05	0.84-1.26
				1989	200	1.56	1.26-1.86
				1993	356	0.77	0.61-0.93
				1997	310	1.39	1.17-1.60
				1998	225	0.71	0.55-0.87
				1999	250	0.86	0.67-1.05
				2000	263	1.55	1.24-1.86
				2001	358	0.89	0.74-1.03
				2002	180	1.45	1.19-1.71
				2004	203	0.89	0.72-1.06
				2005	235	1.27	1.03-1.51
				2007	290	1.54	1.30-1.78
				2008	300	1.43	1.22-1.64
581	Luck Lake	19,818	67%	1986	178	1.74	1.41-2.07
				1988	300	2.11	1.80-2.41
				1993	175	1.10	0.87-1.32
				2001	320	0.60	0.47-0.72
584	Little Ratz	12,392	65%	1992	272	0.94	0.76-1.13
				1997	255	1.93	1.64-2.21
				1998	282	0.78	0.64-0.91

*CFL = commercial forest land, or volume classes 4-7 (currently referred to as productive forest land, or "PFL"). Numbers are from the 1980's, and should be updated.

Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				2000	304	1.38	1.18-1.59
				2001	287	1.20	1.00-1.39
				2002	195	2.32	1.92-2.71
				2003	335	1.21	1.03-1.39
				2004	228	1.96	1.68-2.24
				2005	291	1.51	1.28-1.73
				2007	233	2.41	2.06-2.77
				2008	246	1.44	1.19-1.70
587	Tuxekan	12,129	77%	1988	300	1.06	0.84-1.28
				1997	314	1.04	0.87-1.22
				1998	353	0.48	0.37-0.58
				1999	328	1.26	1.03-1.49
621	12 Mile	23,344	59%	1985	196	0.31	0.19-0.43
				1986	300	0.64	0.48-0.81
				1987	370	0.65	0.49-0.81
				1988	302	0.62	0.46-0.77
				1989	235	0.78	0.59-0.98
				1990	176	1.18	0.84-1.52
				1991	231	1.84	1.48-2.21
				1992	250	0.43	0.32-0.55
				1993	258	0.84	0.63-1.05
				1994	324	0.93	0.76-1.09
				1997	202	1.45	1.10-1.79
				1998	280	0.83	0.63-1.02
				2002	220	0.51	0.38-0.63
				2007	189	1.59	1.32-1.86
				2008	190	2.14	1.75-2.52
625	Trocadero	16,624	75%	1995	235	1.74	1.41-2.06
				1997	235	1.18	0.97-1.38
				1998	267	0.97	0.78-1.16
				2002	332	0.93	0.75-1.10
628	Pt. Amagura	10,477	26%	1997	255	1.04	0.83-1.24
				1998	325	0.93	0.78-1.08
635	Port Refugio	9,118	50%	1985	317	2.69	2.27-3.12
				1986	324	2.52	2.09-2.96

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				1987	369	1.76	1.46-2.07
				1988	270	1.15	0.90-1.40
				1989	507	0.80	0.68-0.93
				1990	232	1.25	1.03-1.48
				1991	367	1.13	0.95-1.32
				1992	254	0.76	0.57-0.95
				1993	213	1.35	0.98-1.71
				1994	280	1.85	1.51-2.19
				1997	276	0.82	0.65-1.00
				1998	315	0.78	0.61-0.96
				2000	272	0.94	0.75-1.13
				2002	317	1.12	0.93-1.31
				2007	311	1.72	1.48-1.96
				2008	342	1.53	1.33-1.73
679	Kitkun Bay	15,359	75%	1988	240	0.31	0.20-0.42
				1989	273	0.89	0.71-1.07
				1995	264	0.40	0.28-0.52
				1997	261	0.31	0.19-0.44
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
				1984	302	0.54	0.44-0.65
				1985	181	0.85	0.65-1.05
				1988	247	1.66	1.38-1.95
				1991	240	1.63	1.35-1.92
				1992	169	1.25	0.96-1.53
				1993	286	1.37	1.16-1.59
				1995	284	1.31	1.09-1.52
				1997	265	0.79	0.65-0.99
				1998	232	0.44	0.34-0.55
				1999	82	0.70	0.53-0.87
				2001	251	0.41	0.30-0.51
				2004	170	0.25	0.15-0.35
				2005	286	0.22	0.15-0.29
				2007	243	0.50	0.35-0.64
719	Port Stewart	21,482	55%	1993	289	1.22	1.03-1.42
				1995	278	1.61	1.35-1.87
				1997	289	1.29	1.08-1.50
				1999	182	0.77	0.57-0.97
				2001	289	0.21	0.13-0.29

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
722	Spacious Bay	31,461	44%	1993	300	0.54	0.43-0.64
				1995	283	0.45	0.35-0.54
				1997	276	0.43	0.33-0.53
				1999	161	0.09	0.04-0.13
				2001	285	0.06	0.02-0.09
738	Margaret	19,286	67%	1985	515	0.57	0.47-0.66
				1986	251	0.84	0.69-1.00
				1988	110	1.31	0.96-1.67
				1989	129	0.62	0.44-0.80
				1990	274	0.56	0.44-0.68
				1991	272	0.76	0.58-0.94
				1993	281	0.31	0.23-0.39
				1995	304	0.70	0.56-0.84
				1997	297	0.56	0.43-0.68
				1999	264	0.47	0.98-1.45
				2001	279	0.44	0.34-0.54
748	George Inlet	19,448	28%	1981	110	0.21	0.09-0.33
				1984	344	0.27	0.19-0.35
				1985	313	0.52	0.39-0.65
				1989	169	1.41	1.08-1.75
				1990	240	1.03	0.82-1.25
				1991	168	1.49	1.15-1.84
				1992	195	0.65	0.49-0.81
				1994	309	0.95	0.79-1.11
				1996	305	0.98	0.76-1.19
				1998	314	0.52	0.40-0.65
				2000	270	0.51	0.38-0.64
				2002	227	0.18	0.09-0.28
				2004	309	0.25	0.18-0.32
752	Whitman Lake	6,015	38%	1981	45	0.18	0.02-0.33
				1987	187	0.16	0.09-0.23
				1990	193	0.46	0.32-0.59
				1992	189	0.20	0.12-0.28
				1997	181	0.81	0.63-0.98
				1998	209	0.47	0.33-0.61
758	Carroll Pt.	11,629	34%	1985	118	0.66	0.46-0.86
				1986	118	0.75	0.56-0.95
				1988	85	1.15	0.81-1.48
				1992	87	0.28	0.14-0.41

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
				1994	125	0.70	0.49-0.90
				1998	125	0.51	0.38-0.64
				2002	84	0.36	0.21-0.50
				2008	122	1.42	1.00-1.83
759	Moth Bay	7,652	23%	1985	140	0.59	0.42-0.74
				1986	156	0.98	0.79-1.17
				1988	78	0.71	0.46-0.97
				1992	136	0.48	0.30-0.66
				1994	136	0.94	0.71-1.17
				1998	176	0.68	0.53-0.82
				2002	150	1.09	0.84-1.34
				2008	191	1.30	1.08-1.53
760	Lucky Cove	12,377	43%	1985	335	1.16	1.00-1.33
				1986	258	1.16	0.95-1.32
				1988	65	1.01	0.68-1.34
				1990	263	1.10	0.92-1.27
				1991	271	1.39	1.07-1.70
761	Vallenar			2003	96	0.99	0.74-1.24
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
				1996	295	1.07	0.90-1.24
				1998	287	0.84	0.67-1.01
				2000	285	0.96	0.77-1.14
				2002	284	0.76	0.59-0.94
				2003	279	0.91	0.71-1.11
				2004	282	0.66	0.53-0.79
				2005	177	0.87	0.62-1.12
				2008	280	0.55	0.39-0.72
767	Duke Island	39,171	17%	1996	294	0.05	0.02-0.09
				2000	282	0.13	0.08-0.18
				2002	292	0.19	0.12-0.26
				2008	291	0.16	0.09-0.22

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Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
769	Alava Bay	13,563	60%	1985	311	0.52	0.39-0.65
				1986	326	0.85	0.68-1.01
				1991	143	1.64	1.22-2.05
				1994	326	0.79	0.64-0.94
				1996	324	0.93	0.77-1.09
				1998	335	0.66	0.52-0.79
				2000	329	0.75	0.56-0.93
				2002	107	1.22	0.90-1.55
				2004	313	0.92	0.75-1.09
	T3 only			2006	92	1.01	0.75-1.27
				2008	330	1.14	0.95-1.32
772	Wasp Cove	4,882	90%	1985	271	0.41	0.31-0.51
				1986	300	0.50	0.38-0.62
				1989	145	0.58	0.39-0.77
				1991	207	0.13	0.07-0.18
821	Winstanley Island	14,104	45%	1991	49	0.27	0.11-0.42
859	Very Inlet	na	na	2002	306	0.11	0.07-0.16
999	Gravina (All Transects)	na	na	1981	226	1.06	0.89-1.22
				1984	1,087	0.86	0.78-0.94
				1985	1,172	1.23	1.13-1.32
				1986	1,267	1.40	1.30-1.50
999	Gravina (Trans. 1,2,3)			1984	376	0.88	0.73-1.03
				1985	224	1.44	1.20-1.67
				1986	346	1.62	1.43-1.81
				1987	334	1.63	1.41-1.84
				1988	278	2.06	1.78-2.35
				1989	182	1.13	0.86-1.41
				1990	279	1.40	1.12-1.68
				1991	154	1.12	0.80-1.43
				1992	302	1.22	1.05-1.38
				1994	331	1.58	1.37-1.79
				1996	338	1.47	1.28-1.67
				1997	274	1.71	1.47-1.95
				1998	307	1.34	1.12-1.56
				2000	267	1.24	1.06-1.42
				2003	78	0.87	0.54-1.20
				2005	205	1.20	0.95-1.46

*CFL = commercial forest land, or volume classes 4-7 (currently referred to as productive forest land, or "PFL"). Numbers are from the 1980's, and should be updated.

Appendix 3: Pellet-group count statistics, Southeast Alaska

VCU	Name	Land Acres	% CFL	Year	Plots	Pellet-Group Mean	95%C.I.
	T1 only			2006	89	0.83	0.57-1.09
	T2 & T3 only (logging on T1)			2007	167	0.86	0.68-1.04

*CFL = commercial forest land, or volume classes 4-7 (currently referred to as productive forest land, or "PFL"). Numbers are from the 1980's, and should be updated.