

THE PATTERN OF DEER HUNTING IN  
SOUTHEASTERN ALASKA - 1976

By

William R. Alves  
Institute of Social and Economic Research  
University of Alaska

and

Robert A. Childers .  
Childers Associates

A Report for the United States Forest Service  
Tongass National Forest

December 1978

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\* Hand-colored maps available for inspection at ISER, 707 "A" Street, Suite 206, Anchorage, AK. or U. S. F. S., Region 10, Juneau, AK.

## I. INTRODUCTION AND PURPOSE

Recreational use of Tongass National Forest contributes significantly to the quality of life in Southeastern Alaska. Deer hunting is one of the most important of those recreational uses. During the 1976-7 hunting season alone, Southeastern residents spent over 14,000 days hunting deer, virtually all on National Forest lands. People living outside the region spent another 1,000 days hunting deer in Southeastern.

Managing the forests' resources to continue to provide deer hunting opportunities is one part of meeting such TLMP evaluation criteria as "Assist(ing) Southeastern Alaska communities and residents in meeting their diverse resource and land use needs," and "Manage(ing) the Tongass National Forest to accommodate the lifestyle and well-being of Southeastern Alaska residents and communities while being responsive to national goals and concerns."<sup>1</sup> But efforts to satisfy the conflicting goals of preserving significant wild areas and maintaining the annual allowable timber harvest threaten deer habitat and therefore deer hunting in the region. Many of the proposed wilderness areas do not contain prime deer habitat. Many of the areas where cutting would have to be increased if harvest levels are to be maintained in the face of wilderness withdrawals do. In fact the best deer winter range usually coincides with the most productive forest lands.

Forest Service planners need information to determine the amount and location of deer habitat to be managed for timber harvest. The data base developed by the TLMP team emphasizes the physical characteristics of the land base such as deer habitat productivity. Productivity of habitat, though, is only one factor among many, such as distance from population centers, that determine the intensity and quality of human use of the land and therefore its

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<sup>1</sup>Tongass Land Management Plan, Draft Environmental Statement, Region 10, U.S. Forest Service, p. 63.

value to users (e.g., hunters). This report looks at deer habitat from a demand perspective intended to complement the Forest Service's existing data base. It shows that Southeastern Alaska's deer habitat is far from evenly used by hunters. By careful selection of habitat to be managed for timber, the magnitude and distribution of costs to hunters can be controlled.

It is the primary purpose of this report to provide Forest Service resource managers with information on deer hunting in Southeastern Alaska that will aid them in assessing the nature and distribution of costs associated with timber harvesting in areas of key deer habitat. Specifically we have used Alaska Department of Fish and Game 1976 deer harvest ticket data to address the following questions:

1. How heavily are the various parts of the Tongass hunted?
2. How does the quality of deer hunting vary over the forest?
3. Who hunts where? Which communities depend heavily on which parts of the forest? Does the pattern of community use leave some settlements more vulnerable to disruption of hunting activities than others?
4. How does the frequency of deer hunting vary from one community to another and why?
5. Which areas have regional and national significance as deer hunting destinations?

For a summary of our findings the reader should turn to Section IV G at the end of the report. Table 1 rates each of our 128 hunting destination areas for deer hunter use, quality of deer hunting, whether or not any communities depend heavily on that area and how important the area is as a deer hunting destination for non-Southeastern Alaska residents. Figure 1 shows the location of our destinations; it accompanies the report.

TABLE 1 SUMMARY OF HUNTING DESTINATION

AREA CHARACTERISTICS

<u>Destination</u>	<u># Hunts</u>	<u>Habitat Rating 1 (acreage adj.)</u>	<u>Hunting Pressure Index 2</u>	<u>Success Rating 3</u>	<u>Regional &amp; National Significance Rating 4</u>	<u>Communities Heavily Dependent Upon Area (% dependence) 5</u>
1	2	N/A	1	1		
2	6	0.2	1	1	3	
4	38	1.0	4	1		
5	79	1.0	5	1	2	Haines (19.2%)
6	226	1.7	5	1	2	Juneau (14.3%)
7	88	2.1	5	1		
8	5	1.0	1	1	3	
9	1	0.0	1	1		
10	2	2.0	3	1		
11	77	2.0	5	2		
12	249	3.0	5	2	1	Juneau (15.2%), Haines (30.8%)
(12A)	(89)	(3.0)	(5)	--		
(12B)	(95)	(3.0)	(5)	--		
(12C)	(0)	(3.0)	(0)	--		
(12D)	(8)	(3.0)	(3)	--		
(12E)	(49)	(3.0)	(5)	--		
(12F)	(8)	(3.0)	(5)	--		
13	96	3.0	4	2	2	
14	28	3.0	5	1		
15	115	2.8	4	3	2	
16	164	3.0	3	2	3	Haines (19.2%)
17	13	3.0	2	2		
18	35	3.0	4	3	3	
19	11	3.0	3	2		
20	9	3.0	2	2		

Table 1 - Continued

<u>Destination</u>	<u># Hunts</u>	<u>Habitat Rating (acreage adj.)</u>	<u>Hunting Pressure Index</u>	<u>Success Rating</u>	<u>Regional &amp; National Significance Rating</u>	<u>Communities Heavily Dependent Upon Area (% dependence)</u>
21	9	2.5	2	3		
22	20	2.8	2	2		
23	96	3.0	4	3	3	Angoon (42.9%) Petersberg (11.2%) Angoon (33.3%)
24	18	3.0	3	2		
25	4	3.0	1	1		
26	2	3.0	1	2		
27	3	3.0	1	1		
28	6	3.0	3	2		
29	3	3.0	2	2		
30	21	3.0	3	3		
31	126	3.0	4	3		Petersberg(11.2%)
32	23	3.0	4	3	3	Petersberg (36.3%) Hoonah (12.9%)
33	6	3.0	3	2	2	
34	15	2.9	2	1	3	
35	4	2.6	3	1		
36	2	3.0	1	1		
37	23	3.0	3	2	2	
38	29	2.0	5	2	3	Hoonah (24.2%) Hoonah (24.2%) Hoonah (12.9%)
39	18	3.0	3	1		
40	5	3.0	3	3		
41	44	3.0	4	2		
42	132	3.0	3	2	3	Tenakee (95.7%)
43	3	3.0	1	2		
44	15	3.0	2	3		
45	22	3.0	3	3		



Table 1 - Continued

<u>Destination</u>	<u># Hunts</u>	<u>Habitat Rating (acreage adj.)</u>	<u>Hunting Pressure Index</u>	<u>Success Rating</u>	<u>Regional &amp; National Significance Rating</u>	<u>Communities Heavily Dependent Upon Area (% dependence)</u>
46	36	2.4	2	2		Pelican (32.6%)
47	38	2.7	3	3		Pelican (41.9%)
48	35	2.8	3	3		Pelican (25.6%)
49	2	3.0	1	3		
50	28	2.9	3	2	3	
51	59	2.8	4	3	3	
52	14	2.5	1	2		
53	41	2.8	2	2	2	
54	33	3.0	3	2		
55	30	3.0	3	1	2	
56	33	3.0	3	3	2	
57	2	2.7	1	3		
58	6	3.0	1	3		
59	13	2.6	1	2	2	
60	126	3.0	4	2	2	Sitka (10.1%)
61	84	3.0	4	2	1	
62	105	3.0	4	3	1	
63	34*	3.0	3	3	2	
64	34	3.0	3	2	3	
65	18	3.0	5	2	3	
66	292	2.5	5	2	3	Sitka (19.1%)
67	102	3.0	4	2	2	
68	124	2.3	3	2	1	
69	2	3.0	1	1		Sitka (10.5%)
70	8	2.0	2	3		

Table 1 - Continued

<u>Destination</u>	<u># Hunts</u>	<u>Habitat Rating (acreage adj.)</u>	<u>Hunting Pressure Index</u>	<u>Success Rating</u>	<u>Regional &amp; National Significance Rating</u>	<u>Communities Heavily Dependent Upon Area (% dependence)</u>
71	21	3.0	3	3		
72	33	2.7	2	3	3	
73	20	3.0	1	3		
74	14	2.3	2	2	3	
75	49	3.0	4	2		
76	2	3.0	1	1		
77	1	3.0	1	3		
78	2	3.0	2	3		
79	13	2.0	4	1	3	
80	1	3.0	1	3		
81	16	1.0	1	1	3	
82	8	1.0	1	1	3	
83	2	1.5	1	1		
84	4	3.0	4	1		
85	17	2.6	2	2	2	
86	18	2.8	1	2	2	
87	6	3.0	2	2		Craig/Klawock (15.0%)
87A	4	3.0	3	2		
88	4	3.0	2	3		
89	30	2.6	2	3		Craig/Klawock (30.0%)
90	1	2.0	1	3		
91	2	3.0	1	3		
92	61	2.1	3	2		
93	5	2.0	1	1		
94	13	2.4	1	1		

Table 1 - Continued

<u>Destination</u>	<u># Hunts</u>	<u>Habitat Rating (acreage adj.)</u>	<u>Hunting Pressure Index</u>	<u>Success Rating</u>	<u>Regional &amp; National Significance Rating</u>	<u>Communities Heavily Dependent Upon Area (% dependence)</u>
95	13	2.7	2	1		Craig/Klawock (15.0%)
96	15	N/A	2	1	2	Craig/Klawock (17.5%)
97	1	3.0	2	1		
98	3	2.0	3	1	3	
99	7	2.4	1	3		
100	5	2.0	1	1	3	
101	9	2.2	2	3		
102	4	2.5	1	1		
103	3	2.0	1	1		
104	10	2.7	1	1		
105	7	3.0	2	1		
106	12	3.0	1	3		
107	4	3.0	1	1		Wrangell (11.9%)
108	6	2.3	1	1		
109	24	3.0	3	1		
110	31	2.1	2	1		
111	27	2.0	3	2		
112	8*	2.0	3	2		
113	74	2.6	3	2	2	
114	85	3.0	3	1	1	
115	152	2.0	5	1	3	Ketchikan (16.5%)
116	26	2.3	2	1		
117	227	3.0	5	2		
118	25	3.0	4	2		Ketchikan (27.2%), Craig/Klawock (10.0%)
119	14	N/A	2	3		

Table 1 - Continued

<u>Destination</u>	<u># Hunts</u>	<u>Habitat Rating (acreage adj.)</u>	<u>Hunting Pressure Index</u>	<u>Success Rating</u>	<u>Regional &amp; National Significance Rating</u>	<u>Communities Heavily Dependent Upon Area (% dependence)</u>
120	4	3.0	1	1		
121	1	2.0	1	1		
122	11	3.0	2	3		
123	2	2.2	1	1		
124	2	1.4	1	1		
125	1	0.8	1	1		
126	5	1.6	1	1	3	
127	1	N/A	1	1		

1 Areally-weighted average TLMF Wildlife Task Force deer habitat rating for VCU.  
 3= Winter range (beach fringe); 2= intermediate winter range (intermediate forested elevations);  
 1= deer present; 0= deer absent.

2 In hunter-days/10,000 acres in 1976. 5 > 100; 4= 50-100; 3= 15-50; 2= 6-15; 1 < 6.

3 Percent of reported hunts resulting in kill. 3 ≥ 60%; 2= 40-60%; 1 < 40%.

4 Percent of hunts in destination area by non-residents of study region.  
 3 ≥ 9%; 2= 2-9%; 1 > 0 and < 2%; No entry= none.

5 Communities with 10% or more hunts occurring at destination (%).

Readers are cautioned that all findings are based on reported deer hunting in a single season, 1976-7. The spatial pattern of deer hunting and its quality undoubtedly changes from year to year in response to weather conditions, and short term variation in habitat quality. We have no information to suggest how our findings would be altered by consideration of additional hunting seasons. There is some evidence to suggest that residents of small communities are less likely to report their hunts. Because of this, use of harvest ticket data may lead to an underestimate of small communities' dependence on deer for sport and sustenance and of hunting pressure in areas near small communities. The relative importance of different hunting areas to residents of a community are unlikely to be affected, though.

We have made no projections of how deer hunting would change in response to population changes, habitat changes or changes in hunter mobility and leisure. Such projections are the subject of a forthcoming proposal.

## II. METHODS: DATA SOURCES AND LIMITATIONS

A. Deer Harvest Tickets as a Source of Hunting Data

Hunting data was gathered from Alaska Department of Fish and Game (ADF&G) deer harvest tickets for the 1976-77 season. In 1976-77, harvest tickets were required of all persons who hunted for deer in Alaska. Harvest tickets must be returned to ADF&G within 15 days after either season closure or after the legal bag limit is taken.

Harvest ticket data are stored on IBM computer tapes in Anchorage and are made available to researchers by special arrangement.

Harvest tickets for 1976-77 requested the following information:

1. Hunter name and address;
2. Resident or nonresident license;
3. Was deer hunted;
4. If hunt made, number of days;
5. Game Management Unit (GMU) and specific locality of hunt;
6. Kill(s) made?;
7. Date of kill(s);
8. Sex of animal(s) killed.

The bag limit for deer in 1976 for Southeastern Alaska was four, and up to four hunts by a hunter could be entered on the harvest ticket. Each individual hunt constitutes a separate case in this study.

Southeastern Alaska includes Game Management Units 1-5. Deer also occur in GMU 6 (Prince William Sound) and 8 (Kodiak, Afognak and related islands).

Use of deer harvest tickets involves two significant data problems:

1. Missing or ambiguous data on returned tickets;
2. Unreported hunts and kills.

B. Missing or Ambiguous Harvest Ticket Data

Data problems are most serious for the location of hunt (destination). Hunters are asked to indicate both the GMU and "specific locality" of hunt, usually the drainage. ADF&G personnel then code this information into three increasingly specific categories: "GMU," "Subunit," and "area."

In 1976, no GMU was reported for 6.0 percent (410 of 6,843) of the state's reported deer hunts. Of the remaining 6433 hunts, 67.1 percent (4319) took place within the study area. If the same proportions applied to the hunts where no GMU was reported, 275 ( $.671 \times 410$ ) of these hunts would be expected to have occurred in Southeastern Alaska. The total number of deer hunts in Southeastern Alaska in 1976 is therefore estimated to be 4594. All but 39 of those 275 cases missing "GMU hunted" information were excluded from analysis in this study since our main purpose was to examine where deer hunting took place. The inadvertent inclusion of 39 cases resulted from an artifact of the computer recode statements used. As it turned out, almost all these hunts were made by residents of Southeastern Alaska, indicating a very high probability they occurred within the study region (approximately 95 percent of all deer hunters living in Southeastern Alaska hunted within that region in 1976). As a result of unreported GMU's, then, our figures understate the number of hunters who reported hunting in the study area in 1976 by approximately five percent ( $((275 - 39) \text{ of } (4319 + 275))$ ).

A more serious difficulty exists for those hunters which did identify the GMU hunted, but either did not indicate the "specific locality" hunted or specified an overly general location (e.g. Admiralty Island). This occurred in 1204 of the 4358 cases included in this study, or 27.6 percent. The 39 hunts without destination information and 1204 hunts with partially specified destinations were allocated to defined destinations as described in "Methods: Data Manipulation."

A second data problem with harvest tickets was zip codes used for constructing hunter "origins." Names and addresses of hunters requesting harvest tickets are entered on a detachable portion of the ticket by the issuing agent and forwarded directly to ADF&G at that time. Zip codes, however, are frequently omitted and numerous misspellings and/or varying abbreviations used in addresses necessitate a time-consuming manual review of records before assigning zip codes by computer. Of the 4358 hunts included in this study seven had no origin information; 25 had nonexistent zip codes which were similar to Southeast zip codes (i.e., falling between 99801 and 99950) and are assumed to be Southeast residents; and 58 had zip codes which are used for several small communities (i.e., 99850 and 99950), making it impossible to determine community of residence from zip code alone. The seven cases without origin information are classified "unknown," while the latter two origin classes were combined as "miscellaneous Southeast," and accounts for 1.9 percent of all recorded deer hunts in the study region.

A final case of missing data occurred in calculating the mean length of hunt. This was calculated by origin of hunter and hunt destination based upon unallocated hunts only.<sup>2</sup> In ten percent of the cases, no hunt length information was given on the harvest ticket. The mean was derived for the given cases and assumed to be valid for all hunts from the subject origin or to a destination, as appropriate. Given the sample size (90 percent of unallocated cases, and 64 percent of all cases), it is unlikely these missing cases would significantly effect the mean trip length.

C. Unreported Hunts and Kills

The second major limitation to use of harvest tickets to estimate hunting pressure is noncompliance. Nonreporting occurs to an unknown

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<sup>2</sup>An "unallocated hunt" is one for which the information available made it unnecessary to manually allocate it to a destination on the basis of partial information.



degree throughout the state but is thought to be most prevalent in isolated, rural areas where the activities of wildlife managers and bureaucrats are far removed from the everyday concerns of the area's inhabitants. No effort was made to account for unreported hunts and kills in this report.<sup>3</sup>

D. Other Data Sources

Three other classes of information were utilized in this report: a measure of habitat quality, destination area, and community population size.

Deer habitat quality evaluations for each VCU (value comparison units, watersheds areas by which Tongass National Forest resource data is tabulated) were made by the Tongass Land Management Plan's Wildlife Task Force. The task force classified each VCUs deer habitat value on a 4 value scale (0-3). Our hunting destination areas were given habitat values equal to the area-weighted average habitat rating for all VCUs comprising that destination. Non-National Forest lands within a destination (for which no habitat ratings were available) were assumed to have the same quality habitat as the area-weighted average for Forest lands in that destination.

The USFS also provides acreage estimates for each VCU in Southeast (unpublished data). For destinations which included non-Forest lands, or only part of a VCU, the acreage included was estimated.

Community population data for 1976 are revenue sharing populations from Alaska Taxable 1976, Department of Community and Regional Affairs,

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<sup>3</sup> There is some evidence that under reporting by residents of small communities is substantial. Our data shows 21 hunts with 12 deer taken by Angoon residents in 1976-77. This is about one animal for every ten households. By contrast a survey of 50 of Angoon's estimated one hundred households the preceding year found 84 percent of respondents indicated that they obtained deer for subsistence. (See p. 160 of City of Angoon Comprehensive Development Plan (December 1976, Alaska Consultants Incorporated).)

Division of Local Government Assistance (January 1977). While these may overstate actual populations in many cases because they are used for revenue-sharing purposes, they are the only published recent population estimates for individual communities.

## III. METHODS: DATA MANIPULATION

A. Data Tapes

ADF&G's harvest ticket data is stored on computer tapes in IBM format. The first task was to copy files onto Honeywell format tapes, rework all data into a format suitable for use by SPSS (Statistical Package for the Social Sciences), correct hunter addresses, and assign missing zip codes. These tasks were accomplished by a series of programs originally written under a National Park Service contract with the University of Alaska (Fairbanks) for application to the Wrangell Mountains area and were performed by the program's author in Fairbanks. The cleaned files were then purged of those cases where hunters obtained harvest tickets but did not hunt that species.

B. Origins or Community of Hunter Residence

Hunter origins were constructed from zip codes. Each community in the study region having one or more unique zip codes became an origin, except where two or more communities are in close proximity. Thus, Juneau, Douglas and Auk Bay are collectively the origin "Juneau." Other joint origins are Craig/Klawock; Annette/Metlakatla; and Ketchikan/Ward Cove.

All hunts were classified as coming from one of 25 mutually exclusive origins, 21 of which represent specific communities or groups of communities. The other four origins are: "Other Alaska," meaning non-Southeast; "Other U.S." for non-Alaska addresses in the U.S.; "Miscellaneous Southeast" for Southeastern residents with mistaken or non-unique zip codes; and "Unknown." Table 2 shows the origins used.

C. Destinations or Hunt Locations

One hundred twenty-seven uniquely defined destination areas were constructed from Alaska Department of Fish and Game's "Game Management Units," "Subunits" and "Areas," which are increasingly specific coding variables to indicate the "specific locality" identified on returned deer harvest tickets. These destinations vary considerably in size and number of VCUs included.

Table 2. Hunter Origins Used for Analysis

## Southeastern Communities:

Annette Island  
 Angoon  
 Craig/Klawock

Elfin Cove  
 Gustavus  
 Haines

Hoonah  
 Hydaburg  
 Juneau

Kake  
 Ketchikan  
 Meyers Chuck

Pelican  
 Petersburg  
 Point Baker

Port Alexander  
 Sitka  
 Skagway

Tenakee Springs  
 Yakutat  
 Wrangell

## Other:

Miscellaneous Southeast  
 Other Alaska  
 Other U.S.  
 Unknown

The process of defining destinations required the mapping of each specified ADF&G "area" on USGS 1:250,000 quadrangle maps. The size of "areas" varied widely, and in many cases one "area" will include several other coded "areas," reflecting differing levels of detail reported as "Specific Locality" on returned tickets. The number of hunts reported in each mapped area were then noted, and area boundaries were compared to VCU boundaries for compatibility.

Final definition of destinations is largely a judgmental effort. It was guided by the following general criteria:

- Whenever possible, the destination boundary would be coincident with VCU boundaries.
- Individual destinations would be reasonably well-defined, and and represent contiguous areas with broadly comparable geographic characteristics.
- In those places where one or more "area" encompassed several other more specific "areas" (for example, the area "Douglas Island" includes the areas "North Douglas Island" and "South Douglas Island"), the level of detail used would be based upon the apparent "reasonableness" of reallocating the more general area's effort to its constituent destinations. This determination reflected both the relative number of hunts in each coded "area" and how well they were defined.
- Where practical, individual destinations would be comprised of VCUs assigned to the same land use designation (LUD) in the Tongass Land Management Plan on Alternative A2 (Administration).
- The total number of destinations would be sufficiently large to preserve reasonable geographic detail, particularly around population centers, while avoiding large numbers of remote destinations with insignificant hunting pressure.

Cases with incomplete, ambiguous, or overly-general hunt locality information were assigned to one of 23 "dummy" destinations for later reallocation to one of the 127 defined destinations. The 127 destinations

are shown on Figure 1 accompanying this report. The correspondence between VCUs and our destination areas appears in Appendix I.

D. Allocation of Hunts from Dummy Destinations to Defined Destinations

Each dummy destination had a specific and unique set of possible defined destinations to which its members could be allocated. For example, all those hunters who identified "Admiralty Island" as the specific locality hunted were placed in dummy destination #151 and were reallocated to defined destinations #12 through #31, i.e. those defined destinations which are on Admiralty Island.

In all but three cases, hunts assigned to dummy destinations were from known origins. Where origins were known, allocations were made proportionally to the set of possible defined destinations for that dummy according to the number of hunts recorded in each of those defined destinations by hunters from the same origin as those being reallocated; i.e., hunts assigned to dummies were reallocated one origin at a time based on the distribution of hunts from that origin. For example, 208 hunts were reported only as having taken place on Admiralty Island which we have divided into 20 separate destination areas. Then 208 cases are reallocated to the 20 areas on the basis of residence of hunter. For instance, 6 of the 208 hunters were from Wrangell. Based on data from 11 other Wrangell residents who gave complete locational information for Admiralty hunts, we reallocated the six hunts to specific Admiralty destinations as follows: 2 to destination #15, 1 to #17, 1 to #27 and 2 to #31.

In many cases a defined destination may be allocated hunts from several dummies. All allocations were based on the number of hunts specifically reported for the defined destinations; i.e., reallocations from one dummy to a defined destination would not affect that destination's allotment from subsequently reallocated dummies.

There is an obvious danger in using a reallocation scheme that implicitly assumes, as we did, that hunts for which we have imperfect

destination information are geographically distributed as those for which we have complete information. If the imperfect information is not due to carelessness of the hunter to record hunt location, but rather to the nature of the area hunted--e.g., there may be a paucity of place names with which to specify location--then we are overestimating hunting demand in areas rich with place identifiers and underestimating it in other name-poor areas. It would be difficult to assess the magnitude of this problem.

#### E. Developing Measures and Indices

In order to highlight the important dimensions of the pattern of deer hunting in Southeastern Alaska, we developed four destination area-specific measures from our data. The four measures indicate:

1. Overall hunting pressure
2. Hunting quality
3. Individual community dependence on areas
4. Regional and national significance of areas

As can be seen, the first two measures indicate the quantity and quality of hunting by areas within Southeastern Alaska, while the latter two address the distribution of use--the "for whom" question. We looked at two aspects of the distributional question at two antipodal scales. First was the extent to which a given hunting area was heavily used by residents of a single community that thereby might suffer if habitat productivity there deteriorated. The second was which areas are disproportionately heavily used by those residing outside Southeastern Alaska, either elsewhere in the state or in the remainder of the United States.

In addition to the four destination area-specific measures, we generated one community-specific measure of a settlement's overall participation in and dependence upon deer hunting.

For each of our measures, we attempted to create a habitat area or community-specific index (as appropriate) to facilitate the use of our

findings in land-use planning decisions. Thus, all destination areas sustaining hunting pressure above a certain threshold (we used 100 hunter days per 10,000 acres per season) were assigned a hunting pressure index of 5. The next most heavily hunted group of habitat areas were assigned a 4, and so on. Because our assignment of index numbers to continuous value variables involves selection of arbitrary cutoffs, we have included the variable values themselves so that resource managers can reindex if desired. We tried to keep the structure of our indices as comparable as possible to those already used in the TLMP process. Index scales range from 1 to 3 or 5, the latter span being employed for those variables where we felt the precision of the measures we were indexing warranted 5 rather than 3 classifications.

For many destination areas and some communities, the measures and, therefore, the index values assigned to them are suspect because of the small number of hunters upon which they are based. Reasoning that some information is better than none, we present these measures and accompanying index values but indicate they are to be used with caution. The following paragraphs discuss the construction of the measures and indices:

#### 1. Overall Hunting Pressure

Pressure here means use intensity or hunting effort per unit area. The ingredients of our hunting pressure measure are the number of people that we infer hunted an area (from our 1976 harvest ticket data file), the mean duration of hunting trips in an area (also from the harvest ticket data file) and the number of acres in an area. The units of our pressure measure are hunter days per 10,000 acres per season.

Had the mean length of hunting trips been roughly the same in all destination areas and all these destination areas been of roughly equivalent size, we could have used the number of hunters visiting each area alone as a measure of pressure. However, we found that trip duration does



vary significantly from a mean of 1 to 2 days around urban areas to 5 days or more in areas that are more remote or contain very highly regarded natural values. In addition, we were forced to use habitat areas ranging in size from as little as 2,000 acres (with several under 10,000) to slightly over a quarter of a million acres (many over 100,000) in order to achieve geographic compatibility between the Forest Services VCU's and the Alaska Department of Fish and Game's (ADF&G) harvest ticket hunt location reporting areas. Thus, we found it necessary to consider in addition to the number of hunters in an area, the length of their stay there and the size of the area in measuring pressure.

A couple of warnings are in order. First, most of our destination areas are comprised of multiple VCUs--an average number being 3 to 4. While hunting pressure undoubtedly varies within our destination areas and therefore among VCUs assigned to the same area, we have no information which would allow us to indicate the magnitude or nature of this variation. We did attempt to minimize the problem in defining destination areas. To the extent possible we chose destination areas to include places of equal accessibility and habitat productivity.

A second warning concerns the area figures we used to normalize hunter days in a destination area--total land area in the destination. Much of this area may not be deer habitat at all, lying above the altitude deer range. Furthermore, in most areas hunting is concentrated at the lower end or beach fringe of the habitat zone. Thus, our pressure figures 1) understate the actual hunting pressure bearing on those portions of the habitat most actively hunted, and 2) will more seriously underestimate the pressure in those habitat areas with a disproportionate ratio of nondeer habitat to total area.

Thus, the absolute value of hunting pressure should be used cautiously but, because we do not believe 2) above to be a serious problem, one can depend on the relative values and, therefore, the index numbers.

Hunting pressure in our 127 destination areas ranged from 0 to over 200 hunter-days per 10,000 total acres with an average over our habitat areas of about 25. We grouped habitat areas into five classes, each comprising all destination areas assigned the same index value, as follows:

<u>Hunting Pressure Index</u>	<u>1976 Season Hunter-Days per 10,000 Acres</u>
5	100 +
4	50 to 100
3	15 to 50
2	6 to 15
1	0 to 6

The characteristics of each class, including the number of VCUs, percent of hunted acreage, and fraction of total hunting effort occurring there will be found in Table 4, page 29.

All those VCUs we did not include in our habitat areas form an implicit sixth class. There are areas for which ADF&G lists no specific destination code which, we assume, means there is no record of hunting there. In some cases, there may be hunting in these areas, but because of lack of place names to identify specific location or ignorance of these names on the part of hunters, hunts there have been assigned by ADF&G to broad geographic areas such as entire islands. For a further discussion of this problem and our treatment of it, the reader is referred to sections II A and III D, respectively.

## 2. Hunting Quality

Hunting quality is undoubtedly a multifaceted concept, the importance of whose component parts vary from one hunter to another. Size and condition of animals, frequency of hunter contact with prey and chances for a fair shot, natural values of the area, enjoyment of the trip from residence to the hunting area should all be factors. We have little information on which to assess quality of hunts in different destination areas except the probability of making a kill. The measure we used was percent of reported hunts that were successful.<sup>4</sup> In 1976, 44 percent of all hunts were successful.

We indexed hunting quality, that is success ratio, as follows:

3	60 percent +
2	30-60 percent
1	0-30 percent

One further possible indicator of quality, the length of time hunters choose to spend in an area, was analyzed and will be discussed in the section IV. This was not used in the quality index because of the rather tentative nature of our conclusion regarding its interpretation.

## 3. Community dependence

This measure was included to flag the importance of certain hunting areas that, while perhaps not heavily used or even offering high quality hunting, are very important to certain communities. These areas may be the traditional hunting grounds of residents of communities, small and large. They are therefore likely to have associated with them the symbolic value used as one of the measures for determining social impact assessment in the TLMP.

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<sup>4</sup>A group of three hunting together is treated as three separate hunts. The same is true of one individual who makes three trips to the same area during the season.

Most of those areas heavily used by residents of the larger communities of Southeastern will stand out because hunting pressure is heavy there. This would not be the case with smaller communities whose interests and needs are therefore not well indicated by the hunting pressure index. These small communities seem more vulnerable to disruption of their hunting activities because their spatial pattern of hunting is more concentrated than that of residents of larger settlements. As such, logging in only a few key areas may impact these communities more severely.

Rather than develop a community dependence index, we have listed those communities that depend heavily (≥10 percent) on each habitat area along with the percent of all of that community's hunts that take place there. We leave it to Forest Service decision makers to take community dependence considerations into account in ways more complex that can be embodied in a single index number.

#### 4. Regional and national importance

This measure is included to indicate which deer hunting areas are especially important to those residing outside Southeastern Alaska. Altogether, these hunters account for only about 6 percent of the deer hunts and 7 percent of deer hunter-days in Southeastern Alaska. The geographical incidence of this hunting differs considerably from that of local hunters so that some areas experience relatively heavier pressure from nonresidents and Alaskans living in other parts of the state. At one extreme, most of our habitat areas were not hunted by non-Southeastern residents at all. At the other extreme, such hunters constitute one-fourth to one-half of the total.

We have assigned each habitat area a regional and national importance index based on the percent of total hunts accounted for by non-Southeastern hunters as follows:

<u>Regional and National Importance</u>	<u>Percent of Total Hunts by Non-Southeastern Residents</u>
3	9 percent +
2	2 to 9 percent
1	0+ to 2 percent
0	0 percent

#### 5. Community deer hunting participation

In addition to destination area use measures, we generated one measure of community involvement in deer hunting--hunter-days per capita for each community. Heavy participation in deer hunting should be regarded as prima facie evidence of important economic or cultural importance of hunting in the community.

## IV. RESULTS

A. Introduction

In 1976-7 hunters spent about 15,600 days afield in pursuit of deer in Southeastern Alaska. This represented about 4,600 hunts averaging about 3.4 days long. 93.2 percent of this hunting effort was by residents of Southeastern Alaska; about 4.1 percent by other Alaskans and approximately 2.7 percent by non-residents. The area hunted covered about 6.15 million acres, equivalent in size to about about 90 percent of the 6.8 million acres identified as intermediate or prime winter deer range in Southeastern Alaska.<sup>5</sup> This area contains somewhat over 400 VCUs or half of the forest's 863 VCUs. The area hunted included almost all the ABC Islands (Admiralty, Baranof and Chichagof), and Revillagigedo Island; some of Prince of Wales, Etolin and Wrangell Islands and none of Kuiu, Kupreanof or Mitkof Islands. Hunting on the mainland was, for the most part, restricted to the area immediately around Juneau and the Cleveland Peninsula just north of Ketchikan.

The association between deer habitat ratings (evaluated using the USFS Wildlife Task Force work sheets) and actual hunting pressure was weak, indicating that the type of habitat is only one of many considerations that determine the value of an area to the hunter. (See Table 3) While most heavily hunted areas were comprised of prime winter habitat, there were notable exceptions. Some of the extremely heavily hunted areas around Juneau and Ketchikan (e.g., the hunting destinations comprised of VCUs 31-35, 37, 38, 124 near Juneau and 749-752 near Ketchikan) were attractive because of their ready accessibility to that major population center. Conversely, there are over 100 VCUs which received the highest habitat rating (3) but experienced no recorded hunting in 1976. In some cases (e.g., the northern part of Chichagof Island)

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<sup>5</sup> See deer habitat categories 2 and 3 from Table 5, Tongass Land Management Plan: Wildlife Task Force Working Report.

**Table 3**  
**Classification of VCU's by**  
**Deer Habitat Class and Hunting Pressure**

		ISER Deer Hunting Pressure Rating					Total	
		1	2	3	4	5		
Wildlife Task Force Deer Habitat Rating	3	65	52	83	35	15	248 of 373 = 66% of all VCU's in this habitat class	
	2	54	25	24	3	9		
	1	44	2	1	1	4		49 of 151 = 32%
	0	13	0	0	0	0		13 of 137 = 9%
Total		173	79	108	37	28		

Note: Only VCU's falling in areas for which ADF&G has records of deer hunting are included.

the likely explanation is remoteness from major settlements, In others (e.g., the middle islands of Kuiu, Kupreanof and Mitkof), the explanation appears to be that the potential of habitat productivity is not presently being realized and game populations are sparse. A third factor discouraging hunting in some prime habitat areas appears to be the absence of protected anchorages in these areas. Finally there may have been some hunting pressure in some of these areas that was incorrectly attributed to neighboring areas which could be more easily identified for purposes of recording "specific hunt location" on the harvest ticket. We suspect this may be the case for many of those reportedly un hunted or lightly hunted areas on Admiralty and Baranof Islands which are surrounded by heavily hunted areas.

While most of that portion of Southeastern Alaska with deer populations receive some hunting pressure (as do some areas without deer!), the pressure is far from evenly spread. We calculated the hunting pressure (hunter-days per 10,000 acres) in each of 127 destination regions and then grouped these into five classes. As Table 4 shows, the most heavily hunted destinations (100 hunter-days per 10,000 and above) account for under four percent of all the area hunted (25 VCUs) but over 30 percent of all deer hunting in Southeastern. The top two hunting pressure groups together include only 12.7 percent of all the area hunted (65 VCUs) but account for about 60 percent of hunting. Because distance from residences is such an important determinant of the spatial pattern of hunting pressure, most of the heavily hunted lands are near the region's major settlements. About one half of all hunting occurs within 25 air miles of Juneau, Sitka and Ketchikan. The remainder of this section discusses the pattern of hunting in Southeastern Alaska in more detail.

#### B. The Spatial Pattern of Deer Hunting in Southeastern Alaska

As mentioned before, a very small portion of all the area hunted in Southeastern Alaska accounts for most of the hunting. The map



Table 4  
 Concentration of Deer Hunting in  
 Southeastern Alaska

<u>Hunting Pressure Group</u>	<u>% of all hunting accounted for</u>	<u>% of all acreage hunted</u>	<u># of VCU's</u>
5 ( $\geq$ 100 hunter days per 10,000 acres)	31.6	3.9	28
4 (50-100 hunter days per 10,000 acres)	28.0	8.8	37
3 (15-50 hunter days per 10,000 acres)	28.0	24.9	108
2 (6-15 hunter days per 10,000 acres)	7.9	19.8	79
1 (0+ - 15 hunter days per 10,000 acres)	4.5	42.7	173
TOTAL	100.0%	100.0%	425 VCU's

(Figure 2) accompanying this report shows which of the five hunting pressure classes each of our 127 destination areas was assigned to. Hunting is concentrated around Juneau, Sitka and Ketchikan and Admiralty Island (especially the east coast), and Chichagof Island (most notably on the west coast, around Hoonah and in Tenakee Inlet).

Table 5 gives the calculated hunting pressure for each destination area, the number of hunters, the percent of hunts there that are successful, the habitat rating (an areally-weighted average of constituent VCUs), mean length of hunts, size in acres and other characteristics. Appendix I shows the correspondence between our destination regions, Forest Service VCUs, and ADF&G hunting locations.

We calculate that 34.3 percent of all hunting (hunter-days) in the region occurs within 15 miles of Juneau, Sitka and Ketchikan, and 48.5 percent occurs within 25 miles of these settlements.<sup>6</sup> The spatial concentration of deer hunting is shown in the lorenz diagram (Figure 3) which gives the minimum amount of acreage necessary to accommodate any given portion of all the region's deer hunting. Note that if hunting pressure were distributed evenly over the 6.15 million acres hunted, the graph line would follow the dashed diagonal from 0,0 to 100,100 (i.e., X percent of the total area hunted would be required to accommodate X percent of all hunting). The deviation of the actual line from the diagonal is a measure of the degree of spatial concentration.

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<sup>6</sup> A 15 mile radius includes the following destinations: 4-7, 13, 14, 60, 65-68, 114, 115, 117 and half of 61, 62, 64, 112 and 118. A 25 mile radius includes these with the following changes: 1) the addition of 11, 12, 63, 74, 75, 111, 113, 116, 119 and 122; 2) all of 61, 62, 64, 112 and 118.

TABLE 5. HUNTING DEMAND AND OTHER CHARACTERISTICS OF DESTINATIONS

Destination	# Hunts	% Success	Success Rating	Habitat Rating (acreage adjusted)	Mean Length of Hunt (Days)	Total Hunter Days	Size 1,000's of Acres	Hunting Pressure (hunter days per 10,000 acres)	Hunting Pressure Index
1	2	0	1	N/A	3.0	6	9.0	3	1
2	6	0	1	0.2	1.5	9	27.6	3	1
4	38	10.7	1	1.0	3.3	125	14.7	85	4
5	79	18.2	1	1.0	3.1	245	10.2	240	5
6	226	10.4	1	1.7	2.6	588	12.5	471	5
7	88	15.4	1	2.1	1.8	158	11.9	133	5
8	5	0	1	1.0	1.0	5	242.5	10	1
9	1	0	1	0.0	NA	---	260.1	0	1
10	2	0	1	2.0	3.5	7	2.0	35	3
11	77	43.9	2	2.0	2.1	162	6.2	263	5
12	249	48.7	2	3.0	3.6	896	56.3	158	5
(12A)	(89)	(49.8)	--	(3.0)	(3.6)	(320)	(13.7)	(234)	(5)
(12B)	(95)	(50.7)	--	(3.0)	(3.6)	(342)	(8.4)	(407)	(5)
(12C)	(0)	--	--	(3.0)	NA	(0)	(5.0)	(0)	(0)
(12D)	(8)	--	--	(3.0)	(3.6)	29	(14.3)	(20)	(3)
(12E)	(49)	(36.7)	--	(3.0)	(3.6)	176	(10.5)	(168)	(5)
(12F)	(8)	(50.0)	--	(3.0)	(3.6)	29	(0.4)	(720)	(5)
13	96	31.0	2	3.0	2.4	230	36.9	62	4
14	28	19.0	1	3.0	2.3	64	5.0	127.	5
15	115	75.0	3	2.8	3.3	380	62.3	61	4

<u>Destination</u>	<u># Hunts</u>	<u>% Success</u>	<u>Success Rating</u>	<u>Habitat Rating (acreage adjusted)</u>	<u>Mean Length of Hunt (Days)</u>	<u>Total Hunter Days</u>	<u>Size 1,000's of Acres</u>	<u>Hunting Pressure (hunter days per 10,000 acres)</u>	<u>Hunting Pressure Index</u>
16	164	47.0	2	3.0	3.8	623	185.6	33	3
17	13	40.0	2	3.0	2.0	26	18.6	14	2
18	35	60.0	3	3.0	3.1	109	19.5	56	4
19	11	44.4	2	3.0	4.9	54	22.0	25	3
20	9	42.9	2	3.0	3.8	34	52.7	7	2
21	9	66.7	3	2.5	3.0	27	25.1	11	2
22	20	56.2	2	2.8	2.5	50	57.5	9	2
23	96	61.2	3	3.0	5.4	518	69.1	75	4
24	18	53.3	2	3.0	3.1	56	27.0	21	3
25	4	25.0	1	3.0	2.8	11	22.6	5	1
26	2	50.0	2	3.0	1.0	2	23.1	1	1
27	3	0	1	3.0	2.0	6	22.7	3	1
28	6	40.0	2	3.0	3.8	23	13.9	16	3
29	3	33.3	2	3.0	2.7	8	13.0	6	2
30	21	86.7	3	3.0	4.2	88	37.6	24	3
31	126	77.6	3	3.0	3.9	491	52.9	93	4
32	23	61.1	3	3.0	2.8	64	8.8	73	4
33	6	40.0	2	3.0	1.8	11	6.7	16	3
34	15	28.6	1	2.9	5.9	89	80.1	11	2
35	4	0	1	2.6	3.7	15	7.3	20	3
36	2	0	1	3.0	1.5	3	39.6	1	1
37	23	36.8	2	3.0	6.3	145	72.9	20	3
38	29	50.0	2	2.0	2.8	81	6.8	120	5
39	18	16.7	1	3.0	3.8	68	31.9	22	3
40	5	100.0	3	3.0	6.4	32	17.3	19	3

<u>Destination</u>	<u># Hunts</u>	<u>% Success</u>	<u>Success Rating</u>	<u>Habitat Rating (acreage adjusted)</u>	<u>Mean Length of Hunt (Days)</u>	<u>Total Hunter Days</u>	<u>Size 1,000's of Acres</u>	<u>Hunting Pressure (hunter days per 10,000 acres)</u>	<u>Hunting Pressure Index</u>
41	44	52.5	2	3.0	8.0	352	62.7	56	4
42	132	43.5	2	3.0	4.7	620	266.3	24	3
43	3	33.3	2	3.0	2.5	8	17.0	5	1
44	15	76.9	3	3.0	2.1	32	39.1	8	2
45	22	65.0	3	3.0	4.0	88	35.2	25	3
46	36	52.6	2	2.4	3.3	119	103.8	12	2
47	38	83.3	3	2.7	3.2	122	54.3	21	3
48	35	88.0	3	2.8	3.9	137	56.5	26	3
49	2	100.0	3	3.0	1.0	2	19.6	1	1
50	28	55.0	2	2.9	4.1	115	48.6	24	3
51	59	76.7	3	2.8	7.6	448	45.7	98	4
52	14	54.5	2	2.5	1.5	21	38.4	6	1
53	41	58.8	2	2.8	2.7	111	98.6	11	2
54	33	57.1	2	3.0	2.2	73	42.5	17	3
55	30	29.2	1	3.0	3.2	96	21.4	45	3
56	33	79.3	3	3.0	1.8	59	38.6	15	3
57	2	100.0	3	2.7	1.5	3	35.9	1	1
58	6	60.0	3	3.0	1.2	7	31.8	2	1
59	13	40.0	2	2.6	2.2	29	71.7	4	1
60	126	51.8	2	3.0	2.2	277	50.5	55	4
61	84	51.4	2	3.0	2.2	185	28.6	65	4
62	105	61.5	3	3.0	1.6	168	21.9	76	4
63	34	60.0	3	3.0	1.6	54	35.7	15	3
64	34	53.8	2	3.0	2.4	82	52.9	15	3
65	18	52.9	2	3.0	2.0	36	2.1	174	5

<u>Destination</u>	<u># Hunts</u>	<u>% Success</u>	<u>Success Rating</u>	<u>Habitat Rating (acreage adjusted)</u>	<u>Mean Length of Hunt (Days)</u>	<u>Total Hunter Days</u>	<u>Size 1,000's of Acres</u>	<u>Hunting Pressure (hunter days per 10,000 acres)</u>	<u>Hunting Pressure Index</u>
66	292	34.7	2	2.5	3.1	905	48.7	186	5
67	102	54.4	2	3.0	1.9	194	30.1	64	4
68	124	47.2	2	2.3	1.9	236	50.0	47	3
69	2	0	1	3.0	8.0	16	27.7	4	1
70	8	75.0	3	2.0	2.8	22	31.7	7	2
71	21	80.0	3	3.0	3.8	80	34.8		
72	33	70.4	3	2.7	2.5	83	119.8	23	3
73	20	83.3	3	3.0	2.4	48	96.9	7	2
74	14	50.0	2	2.3	2.4	34	31.8	5	1
75	49	51.2	2	3.0	2.1	103	17.5	11	2
76	2	0	1	3.0	7.0	18	45.6	59	4
77	1	100.0	3	3.0	3.0	3	6.9	3	1
78	2	100.0	3	3.0	2.0	4	6.1	4	1
79	13	20.0	1	2.0	5.8	75	9.1	7	2
80	1	100.0	3	3.0	4.0	4	31.0	82	4
81	16	10.0	1	1.0	2.5	40	117.7	1	1
82	8	0	1	1.0	8.0	64	149.0	4	1
83	2	0	1	1.5	3.0	6	36.1	4	1
84	4	0	1	3.0	15.0	60	6.3	2	1
85	17	50.0	2	2.6	3.9	66	100.8	96	4
86	18	40.0	2	2.8	2.7	49	103.7	7	2
87	6	50.0	2	3.0	1.8	11	13.1	5	1
87A	4	37.5	2	3.0	4.6	18	10.1	8	2
88	4	100.0	3	3.0	1.0	4	4.3	18	3
89	30	80.0	3	2.6	1.4	42	44.1	9	2

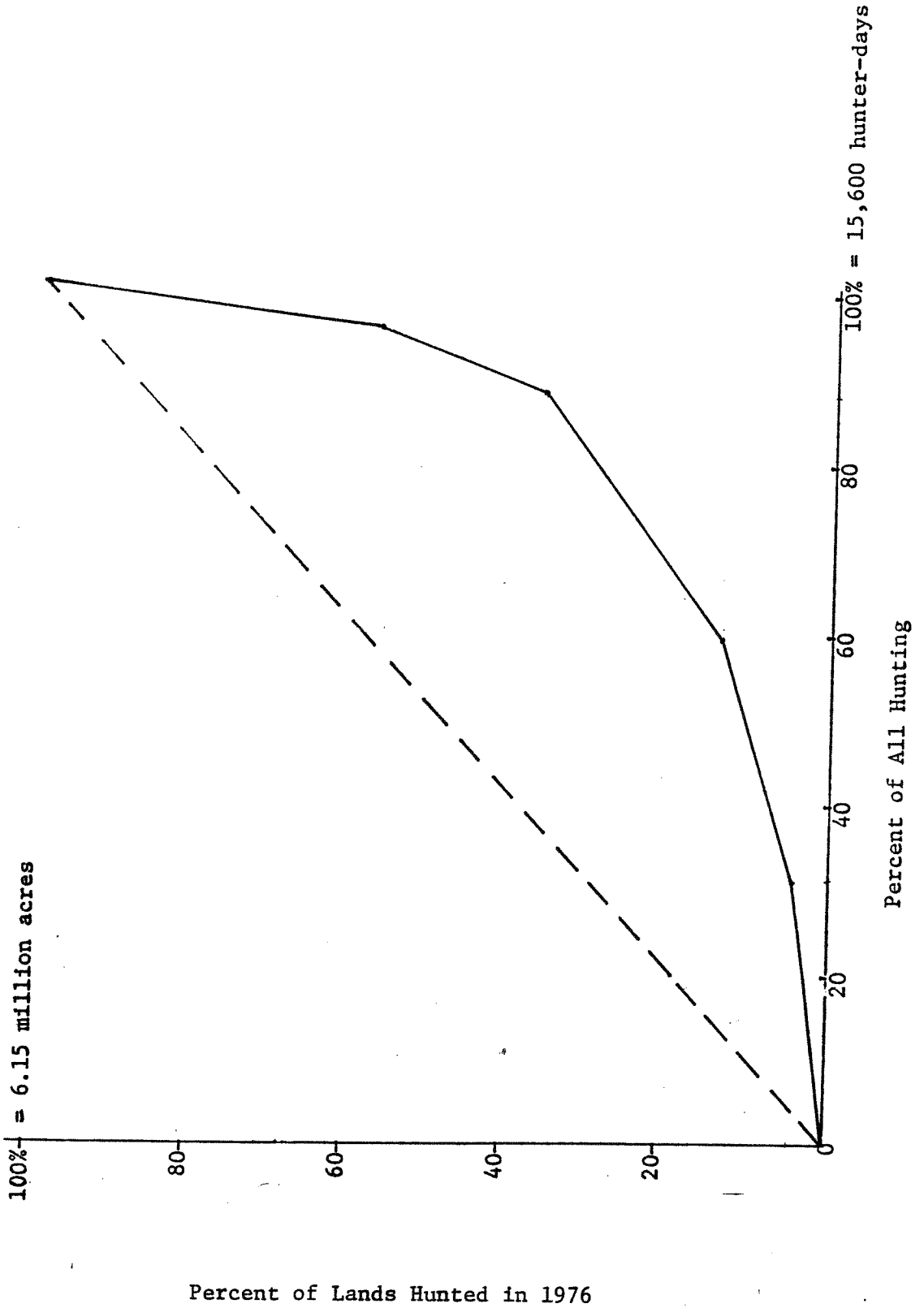
<u>Destination</u>	<u># Hunts</u>	<u>% Success</u>	<u>Success Rating</u>	<u>Habitat Rating (acreage adjusted)</u>	<u>Mean Length of Hunt (Days)</u>	<u>Total Hunter Days</u>	<u>Size 1,000's of Acres</u>	<u>Hunting Pressure (hunter days per 10,000 acres)</u>	<u>Hunting Pressure Index</u>
90	1	100.0	3	2.0	3.0	3	24.7	1	1
91	2	100.0	3	3.0	3.0	6	18.5	3	1
92	61	42.9	2	2.1	5.8	354	117.4	30	3
93	5	0	1	2.0	N/A	N/A	37.4	N/A	1
94	13	14.3	1	2.4	5.0	65	118.4	6	1
95	13	28.6	1	2.7	2.4	31	41.3	8	2
96	15	25.0	1	N/A	1.9	29	20.0	14	2
97	1	0	1	3.0	3.0	3	5.0	6	2
98	3	0	1	2.0	2.1	6	2.7	23	3
99	7	100.0	3	2.4	2.2	15	37.1	4	1
100	5	20.0	1	2.0	1.4	7	132.3	1	1
101	9	100.0	3	2.2	7.5	68	73.0	9	2
102	4	0	1	2.5	2.0	8	159.6	1	1
103	3	0	1	2.0	1.3	4	8.7	5	1
104	10	0	1	2.7	1.7	17	29.8	6	1
105	7	0	1	3.0	1.5	11	28.5	4	2
106	12	100.0	3	3.0	1.0	12	24.0	5	1
107	4	0	1	3.0	2.3	9	31.5	3	1
108	6	0	1	2.3	7.0	42	99.0	4	1
109	24	27.8	1	3.0	3.2	77	25.9	30	3
110	31	12.0	1	2.1	2.0	62	50.4	12	2
111	27	33.3	2	2.0	2.8	76	35.6	17	3
112	8	33.3	2	2.0	3.2	26	10.9	23	3
113	74	38.2	2	2.6	2.7	200	125.9	16	3
114	85	20.3	1	3.0	2.3	196	41.6	47	3
115	152	18.8	1	2.0	4.0	608	31.5	193	5
116	26	10.0	1	2.3	1.6	42	61.5	7	2
117	227	39.6	2	3.0	2.6	590	46.5	126	5
118	25	30.0	2	3.0	2.1	53	5.5	96	4
119	14	76.9	3	N/A	3.1	43	69.7	6	2

<u>Destination</u>	<u># Hunts</u>	<u>% Success</u>	<u>Success Rating</u>	<u>Habitat Rating (acreage adjusted)</u>	<u>Mean Length of Hunt (Days)</u>	<u>Total Hunter Days</u>	<u>Size 1,000's of Acres</u>	<u>Hunting Pressure (hunter days per 10,000 acres)</u>	<u>Hunting Pressure Index</u>
120	4	25.0	1	3.0	4.0	16	39.9	4	1
121	1	0	1	2.0	2.0	2	5.1	4	1
122	11	66.7	3	3.0	2.4	26	26.0	10	2
123	2	0	1	2.2	2.0	4	88.6	1	1
124	2	0	1	1.4	5.5	11	98.3	1	1
125	1	0	1	0.8	2.0	2	174.0	1	1
126	5	0	1	1.6	2.0	10	17.3	6	1
127	1	0	1	N/A	3.0	3	10.0	3	1



Figure 3. LORENZ CURVE OF SPATIAL CONCENTRATION OF DEER HUNTING IN SOUTHEASTERN ALASKA

(Minimum Percent of All Area Hunted Necessary to Accommodate any Portion of Total Hunting Effort)



The implications of this high degree of concentration are clear: by appropriate management of a relatively small portion of all deer habitat in the region, a large portion of all present hunting can continue to be accommodated.

C. Length of Deer Hunting Trips in Southeastern Alaska

Hunt duration is important for several reasons. First, as explained in section III D, it is a necessary ingredient in the calculation of hunting pressure (hunter-days). Second, patterns of trip length to different hunting areas give some insight into how the spatial incidence of hunting may change as hunter's leisure and mobility increase. Third, anomalously long trip length (i.e., beyond what can be explained by the remoteness of a destination) may be associated with the choice to remain longer in an area because of its exceptional natural features. As such, trip length may be one measure of recreation quality of an area.

Some areas which are visited by relatively few hunters are more important than the number of individuals alone would indicate because hunting trips to these destinations are longer than average. Conversely, some areas near cities are less important than number of hunters alone would indicate because trips there tend to be short. Figure 4 gives a frequency distribution of mean trip duration by destination area.<sup>7</sup> About 60 percent of all destinations have average duration of hunting trips falling between two and four days with 20 percent above that and 20 percent below that. As would be expected, short trips are clustered around cities while longer trips are made to more remote habitat areas. The trip length frequency diagrams for all Southeastern (Figure 5A), the heavily hunted area around Sitka (Figure 5B) and W. Chichagof/S.E. Admiralty (Figure 5C) illustrate this. Urban area trips are

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<sup>7</sup>We have mapped only those destinations which received 10 or more hunters during the 1976 season to avoid showing data derived from only a few perhaps unrepresentative trips.

Figure 4. FREQUENCY DISTRIBUTION OF MEAN LENGTH  
OF HUNT BY DESTINATION

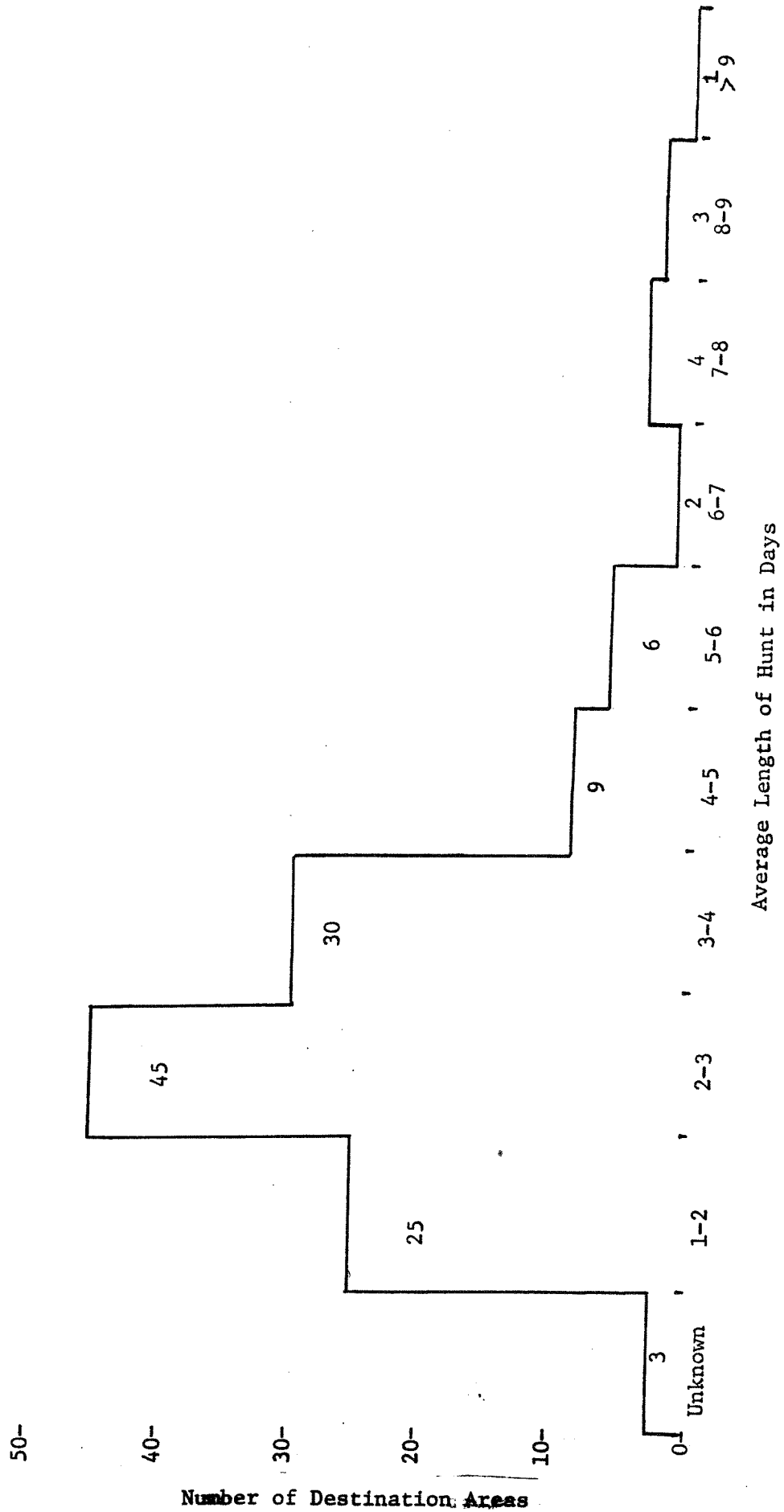
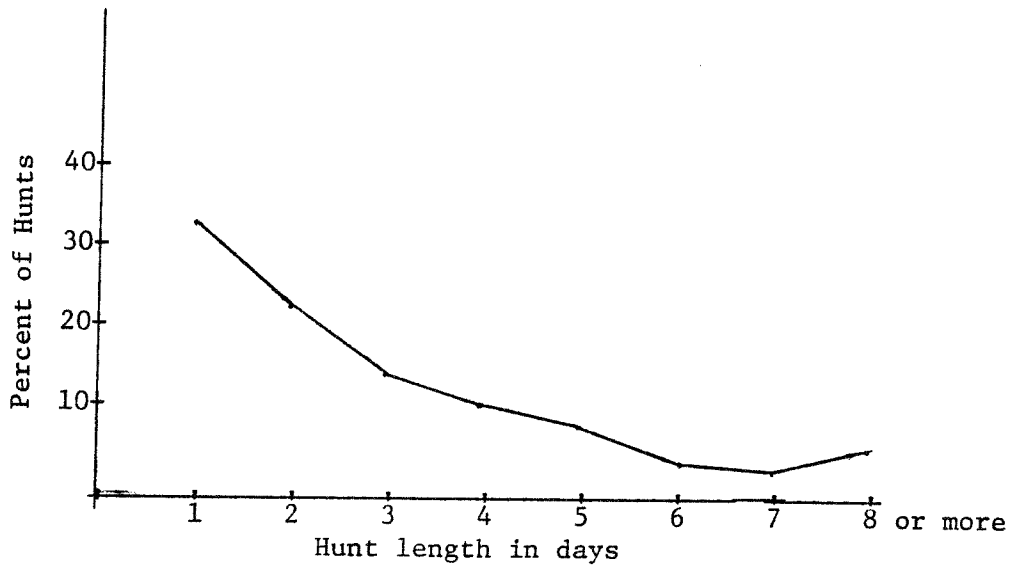
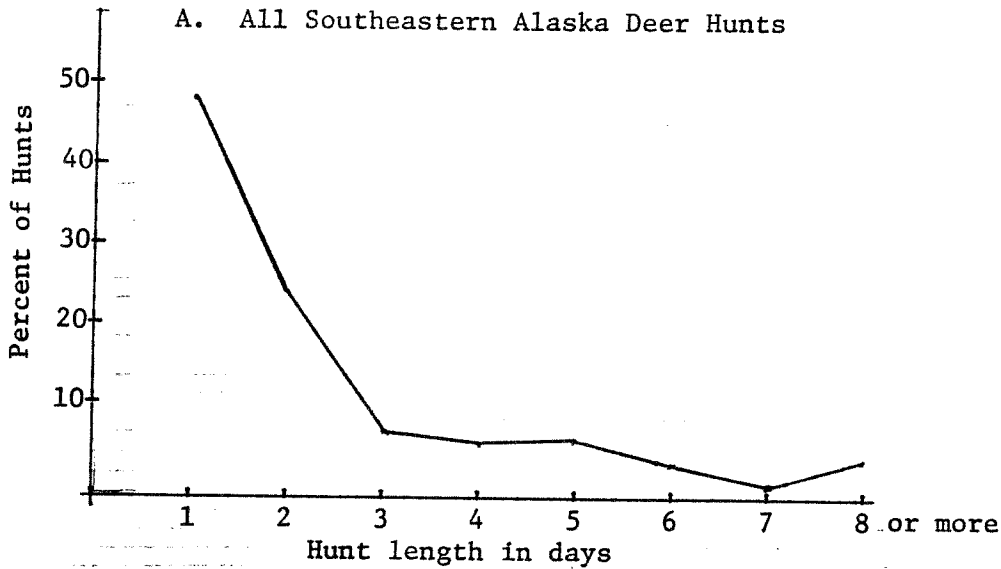


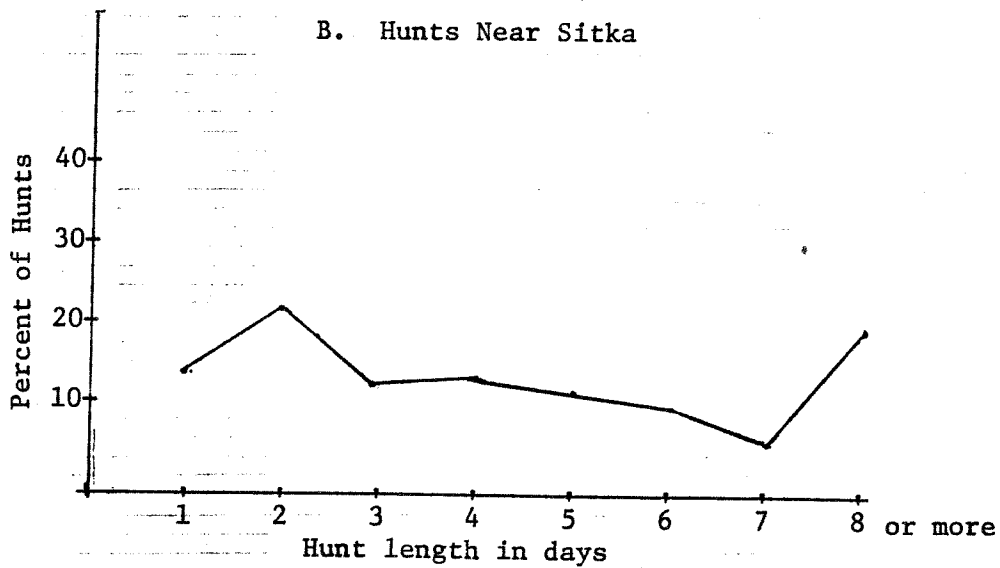
Figure 5. DISTRIBUTION OF HUNTING TRIP LENGTHS  
BY LOCATION OF HUNT



A. All Southeastern Alaska Deer Hunts



B. Hunts Near Sitka



C. Hunts of E. Admiralty and W. Chichagof

usually for the day or weekend with only one in five lasting over three days. By contrast over half of all trips to west Chichagof or southeast Admiralty are four days or more with one in five lasting over a week.

Most hunting occurs around the large communities because most hunters live there and can't get farther afield in the leisure time available. This suggests that the very tight pattern of spatial concentration of hunting in Southeastern will loosen up somewhat as

- 1) hunter mobility increases through access to larger boats or private planes, or simply rising incomes;
- 2) leisure time available increases; and
- 3) preferred substitutes decline, making deer hunting more attractive to sportspersons.

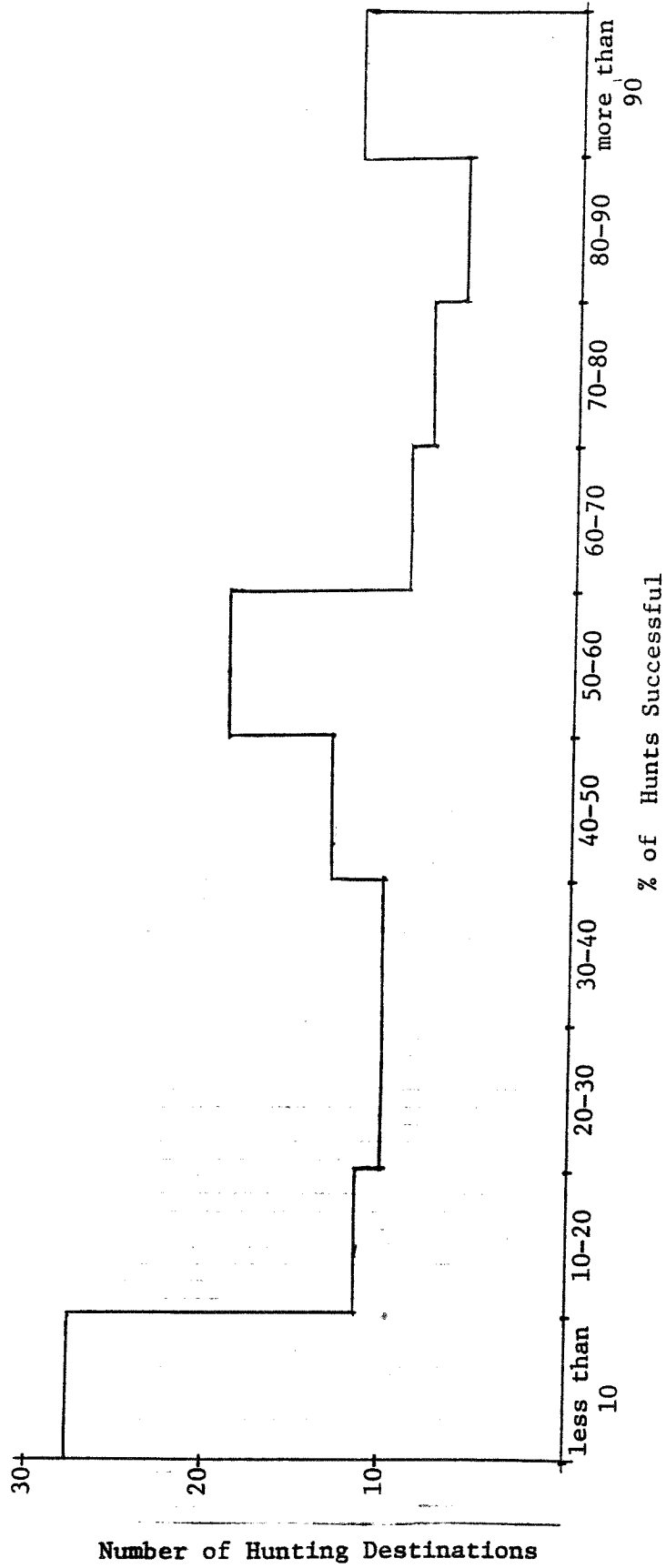
#### D. The Quality of Deer Hunting in Southeastern Alaska

The value of deer habitat to hunters depends not only on the intensity of its use but the quality of experience it affords. As discussed in the section on measures (III D), hunting quality is a broad, rather ill-defined concept. We have relied solely on the percent of hunts that are successful (that is, a kill is made) as a quality measure.

In the Southeast 44.3 percent of all deer hunts were successful in 1976-7. The percentage doesn't vary appreciable among Southeastern residents, other Alaska residents (44.0) and non-residents (39.6). There is, however, a wide range of success rates associated with different hunting areas. Figure 6 gives the distribution of success rate by destination. Table 5 shows the percent success and success rating (a scaled value from 1 to 3) for each of the 127 destinations.

The map accompanying the report (Figure 7) shows the location of destinations which have success rates either considerably above (class 3) or considerably below (class 1) the regional average. As can be seen the best hunting occurs on west Chichagof, south Baranof and east Admiralty Islands. While it is true that trips to these areas last longer than average

Figure 6. FREQUENCY DIAGRAM OF PERCENT OF HUNTS SUCCESSFUL  
BY HUNTING DESTINATION AREAS



and therefore, one would expect more of them to result in a kill, trip length alone explains only a small part of the high success rate in these areas.

An important finding is that no destinations in the heaviest hunting pressure group (class 5) provided significantly better than average hunting, even where class 3 (prime winter) habitat prevails. There are several possible explanations for this. One is that hunting pressure has already reached a level in these areas where it is depressing deer populations. This would contradict the conventional wisdom. Another possible explanation is that it is not the hunting pressure itself, but other development activities in and around these areas (which are almost all near large cities) that is adversely affecting game populations. A third explanation is that while hunting pressure or development activities are not depressing game populations appreciably, they are moving animals out of those parts of the destination areas that are easily accessible to hunters. These three explanations have quite different management implications.

The poorest hunting occurs in mainland areas which are characterized by low quality habitat, on the northern fringe of Chichagof Island and on most of Prince of Wales and Revilla Islands.

#### E. Community Dependence on Hunting Areas

Earlier we suggested that a land manager could continue to accommodate the vast majority of deer hunting in the region by preserving only a small part of all deer habitat. That part would be the heavily hunted areas near Juneau, Sitka and Ketchikan. If these areas were preserved at the expense of other areas, the cost of habitat degradation would fall predominantly on residents of the region's smaller communities. Besides the questionable equity of such a strategy, it may be inadvisable because residents of small communities may depend more heavily on deer hunting for sustenance or recreation.

In order to look at who would gain and lose from a pattern of habitat change in Southeastern, we have to look beyond use intensity and quality of hunting in destinations to who hunts where. Appendix II gives a rank ordering of the importance of the hunting destinations to hunters of each community in the region. (This table is derived from a crosstabulation of number of hunts by community of residence and destination which is included as Appendix III. ) Given a set of possible habitat changes this table can be used to gauge the likely impact on each community in the region.

The series of maps accompanying this report (Figures 8A through D) show the areas most depended upon by each community for which we have records of 25 or more hunts in 1976-7. These are Juneau, Haines, Pelican, Sitka, Petersburg, Wrangell, Craig/Klawock, and Ketchikan. Magenta areas identify those destinations necessary to provide 50 percent of all hunts from a community. Yellow areas bring the total up to 75 percent and green up to 90 percent.

An important finding here is that small communities tend to be more dependent on only a few hunting areas to satisfy their needs. Four or fewer destination areas typically account for 75 percent of all hunts by residents of small communities. In Juneau, Sitka and Ketchikan, on the other hand, the comparable number of areas is 9 or 10. The needs of these small communities are therefore more vulnerable to disruption of customary hunting patterns.

Table 6 indicates at a glance which destinations are heavily depended upon by which communities. All cases in which a single destination accommodates at least 10 percent of the hunts by residents of any community are noted.



The final table in this section (Table 7) deals with the participation of communities in deer hunting rather than the spatial dimensions of that participation. We hypothesized earlier that small communities might be more dependent upon deer hunting. A greater dependence would likely be associated with more time per person being devoted to deer hunting. In an attempt to test whether such communities were indeed more dependent, we calculated the hunter effort (hunter days) expended by residents of each community in the region and divided it by the 1976 population to get hunter-days per person for each community.

This per capita effort ranges broadly among communities. But it is difficult to generalize about the variation. As one would expect residents of those communities far from good deer habitat such as Haines, Skagway and Yakutat don't spend as much time deer hunting. Other differences are not so easily explained and may have their roots in the values that distinguish one community from another. For instance, why do the people of Petersburg spend so much more time hunting than their neighbors in Wrangell? Is it because boat ownership is higher? Two small communities--Tenakee and Pelican--stand out because of their heavy participation in deer hunting. As a class, residents of small communities in general and predominantly Native communities in particular do not appear to spend more time than their urban counterparts. If anything, the data suggest the reverse is true. These findings may be skewed by a higher incidence of unreported hunting by residents of smaller communities.<sup>8</sup>

F. Regional and National Value of Southeastern Hunting Areas

Although only about 6 percent of all deer hunts (and 7 percent of hunting effort) in Southeastern are by people not living within the region, the spatial pattern of non-resident (i.e., non-Southeastern) hunting suggests that some parts of the National Forest have regional

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<sup>8</sup>See note 3, p. 13.

Table 6: Important Hunting Destinations  
for Individual Communities

<u>Destination #</u>	<u>Communities Depending Heavily on Destination and % of Community's Hunts Taking Place There</u>
5	Haines (19.2%)
6	Juneau (14.3%)
12	Juneau (15.2%), Haines (30.8%)
16	Haines (19.2%)
22	Angoon (42.9%)
23	Petersburg (11.2%)
24	Angoon (33.3%)
30	Petersburg (11.2%)
31	Petersburg (36.3%)
32	Hoonah (12.9%)
37	Hoonah (24.2%)
38	Hoonah (24.2%)
39	Hoonah (12.9%)
42	Tenakee (95.7%)
46	Pelican (32.6%)
47	Pelican (41.9%)
48	Pelican (25.6%)
60	Sitka (10.1%)
66	Sitka (19.1%)
68	Sitka (10.5%)
86	Craig/Klawock (15.0%)
89	Craig/Klawock (30.0%)
95	Craig/Klawock (15.0%)
96	Craig/Klawock (17.5%)
106	Wrangell (11.9%)
115	Ketchikan (16.5%)
117	Craig/Klawock (10.0%), Ketchikan (27.2%)

Table 7. Demand and Other Characteristics of Origins

<u>Origin</u>	<u># Hunts</u>	<u>% Success</u>	<u>Mean Hunt Duration (days)</u>	<u>Effort (Hunter-days)</u>	<u>Hunting Productivity (Deer per Hunter-day)</u>	<u>1976 Population</u>	<u>Per Capita Effort</u>
Juneau	1,495	37.1	3.7	5,532	0.101	19,193	0.29
Angoon	21	57.1	1.8	38	0.316	437	0.09
Elfin Cove	4	50.0	5.3	21	0.095	-	-
Gustavus	16	62.5	3.9	62	0.161	-	-
Haines	26	38.5	2.9	75	0.133	1,366	0.05
Skagway	2	0.0	3.0	6	0.0	858	0.01
Hoonah	62	45.2	4.4	273	0.103	848	0.32
Pelican	43	95.3	4.4	189	0.217	169	1.12
Tenakee	23	34.8	5.1	117	0.068	109	1.07
Sitka	1,144	54.0	2.8	3,203	0.193	7,100	0.45
Port Alexander	3	100.0	1.0	3	1.000	51	0.06
Kake	12	58.3	2.9	35	0.200	679	0.05
Petersburg	179	67.0	3.5	627	0.191	2,126	0.25
Wrangell	101	50.5	3.7	374	0.136	3,152	0.12
Pt. Baker	9	77.8	3.5	32	0.206	-	-
Craig/Klawock	40	72.5	2.0	80	0.363	748	0.11
Hydaburg	1	100.0	4.0	4	0.250	384	0.01
Meyers Chuck	2	0.0	4.0	8	0.000	-	-
Ketchikan	802	31.3	3.3	2,647	0.095	11,262	0.24
Annette I.	17	41.2	3.5	60	0.117	-	-
Yakutat	15	53.3	1.4	21	0.381	442	0.05
Misc. S.E.	83	60.2	4.6	382	0.131	-	-
Other AK	161	43.5	3.9	628	0.116	-	-
Other U.S.	90	39.6	4.7	423	0.085	-	-
Unknown	7	N/A	N/A	N/A	-	-	-

and national recreational importance. To determine which areas these were, we calculated the fraction of all hunts accounted for by other Alaskans and non-Alaskans and compared it to the regional average.

Figure 9 shows how the areas most heavily hunted differ between non-residents and all Southeastern hunters. The spatial pattern of non-resident hunting appears to be the result of the superimposition of two component patterns. One is the non-resident urban area hunt (see the "around towns" category). These hunts are likely made on trips to Southeastern to conduct business or visit friends and relatives and therefore tend to replicate the spatial pattern of resident hunting. These deer hunts are likely to be incidental to the main purpose for visiting the region.

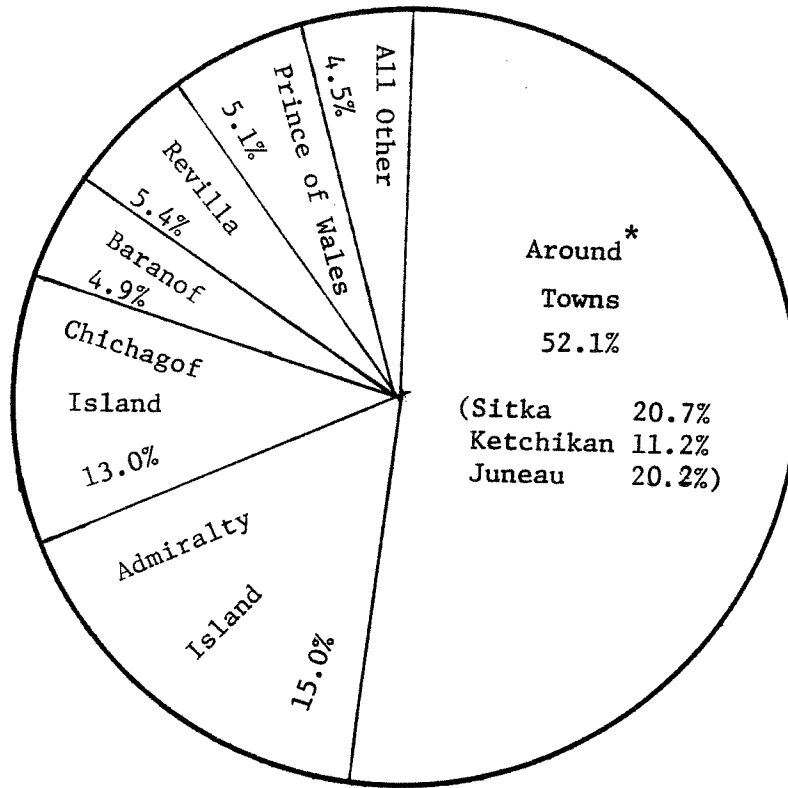
The other pattern is comprised of those trips to more remote locations within Southeastern, most notably Admiralty (the east coast) and Chichagof Islands (West Chichagof and Tenakee Inlet). The cost of getting to these places, the longer time hunters spend there and the better quality hunting all make it more likely that the hunt was a prime reason for the trip to Southeastern.

Table 8 shows the percent of all hunts in a destination region that were made by non-Southeastern residents and assigns a regional and national importance rating to each as follows:

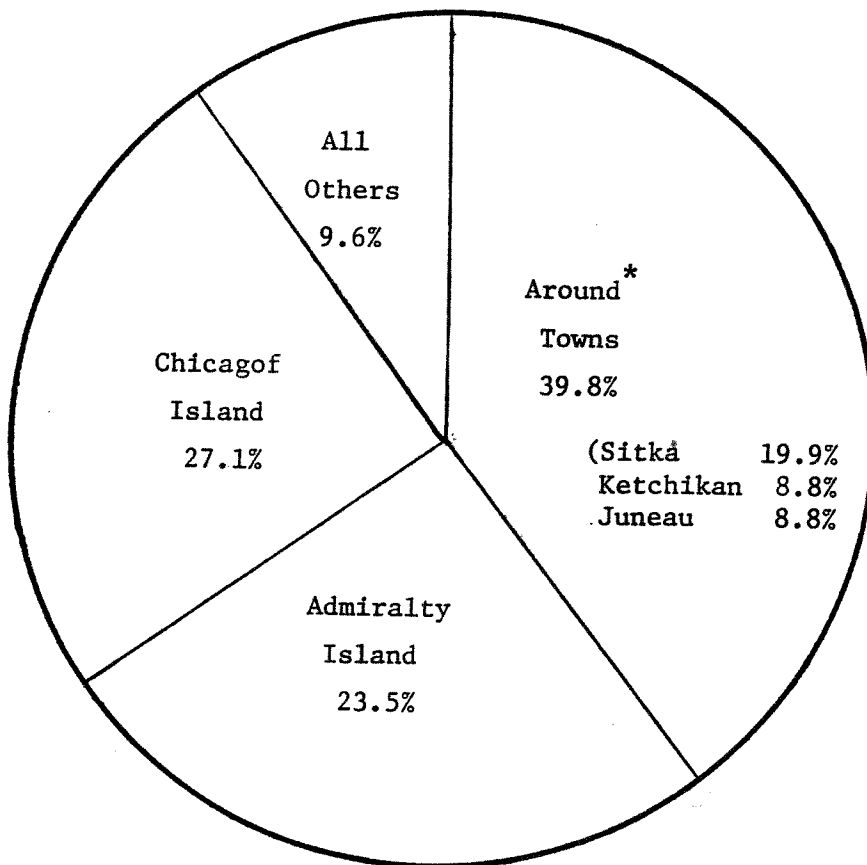
<u>If the % is</u>	<u>the rating is</u>
0	0
0-2	1
2-9	2
greater than 9	3

Figure 10 (a map accompanying the report) shows the use of individual destinations by non-Southeastern residents.

Figure 9. LOCATION OF DEER HUNTS IN SOUTHEASTERN ALASKA  
BY CLASS OF RESIDENT



A. All Hunters (93% Southeastern Alaska Residents)



\* Includes portions of Admiralty, Revilla and Baranof within 28 miles of cities.

Table 8: Where Non-Southeastern Residents  
Deer Hunt in Southeastern Alaska

<u>Destination</u>	<u>% of All Hunts by Non-SE Residents**</u>	<u>Regional/National Importance Rating**</u>
2	17*	3*
5	6	2
6	3	2
8	40*	3*
12	2	1
13	6	2
15	5	2
16	12	3
18	17	3
23	13	3
31	12	3
32	4	2
33	17*	3*
37	4	2
38	10*	3*
42	26	3
50	47	3
51	12	3
53	7	2
55	3	2
56	3	2
59	8	2
60	2	2
61	1	1
62	1	1
63	9	2
64	12*	3*
65	11*	3*
66	10	3
67	3	2
68	1	1
72	12*	3*
74	29*	3*
79	23*	3*
81	13*	3*

Table 8 Continued

<u>Destination</u>	<u>% of All Hunts by Non-SE Residents**</u>	<u>Regional/National Importance Rating**</u>
82	13*	3*
85	6	2
86	6	2
96	7	2
98	100*	3*
100	20*	3*
113	5	2
114	1	1
115	11	3
126	40*	3*

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\*Means assigned to class 3 on basis of fewer than 5 hunts. Should be used cautiously.

\*\*All percents are rounded but unrounded figures are used to assign to rating class.

G. Summary of Findings

1. In 1976 hunters spent about 15,600 hunter-days in pursuit of deer in Southeastern Alaska. This represents approximately 4600 separate hunts averaging 3.4 days in duration.
2. Southeastern residents account for almost all this hunting pressure. Only 7 percent is by hunters non-resident in the region--4.1 percent by other Alaskans and 2.7 percent by non-Alaskans.
3. Over 80 percent of all recorded hunting pressure in the region is by residents of the three largest communities--Juneau, Sitka and Ketchikan.
4. Hunting pressure in Southeastern is heavily concentrated around large communities. 48.5 percent of all hunting takes place within 25 miles of Sitka, Juneau and Ketchikan; 34.3 percent is within 15 miles. Thus about a third of all hunting takes place on only 4 percent of Southeastern deer habitat.
5. Some hunting areas stand out because of their relatively heavy use by Alaskan non-residents and people from other parts of the state. Important areas are the east coast of Admiralty Island, the west coast of Chichagof Island and the Tenakee Inlet area. Hunting trips in these same areas are significantly longer than the regional average or than those in nearby areas (almost 5 days as opposed to 3.4 days), suggesting that these areas are characterized by prime natural values.



6. Communities within Southeast vary widely in the degree to which their residents hunt deer. The regional average is 0.31 hunter-days per season per capita. The range among communities is .01 to 1.12. Those communities with very low participation tend to be far from good habitat areas (Haines, Skagway, Wrangell and Yakutat) or Native communities (Angoon, Kake, Craig/Klawock, Hydaburg). Underreporting is a likely explanation for the latter class. Two communities stand out as very dependent on deer hunting--Tenakee Springs and Pelican.
7. Productivity of hunting (kill per hunter-days) varies widely among hunting areas, being lowest in the heavily hunted areas near large cities, especially where habitat values are low. Residents of native villages have the highest deer-hunting productivity.
8. Some communities depend heavily on certain hunting areas, suggesting that any degradation of habitat productivity in these would impact the community adversely. Many of these are near small communities and not hunted heavily compared to areas near Juneau, Sitka and Ketchikan. Small communities are more vulnerable to disruption of their customary hunting by adverse habitat change because they depend on fewer hunting areas to satisfy their needs.

APPENDIX I

Appendix I

KEY: DESTINATIONS

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
1	NF <sup>1</sup>	1-4-477
2 <sup>2</sup>	16 17 25	1-3-367
4	31	1-3-359
5	32 38	1-3-342 1-3-345 1-3-347 1-3-357
6	33(N-.5) <sup>3</sup> 34 35	1-3-334 1-3-335
7	33(S-.5) 36 37	1-3-337 1-3-341
8	40 41 42 43 44 46 51 52 53 54	1-3-331

1. NF= destination includes non-Forest lands.
2. Associated VCU's: 12, 13, 14, 15, 23, 24. "Associated VCU's" are those areas outside the destination which are; (a) important to the destination as habitat within the same drainage(s), and (b) are not included within other destinations.
3. N, S, E, W= Compass points; decimal fraction is approx. portion of VCU in destination. For example, XXX(N-.3) means: destination includes approx. Northern 3/10 of V.C.U. XXX.

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
9	62 63 64	1-3-303
10	117(S-.2)	1-4-401
11	124	1-3-360
12	(12A)-- 125 (12B)-- 126 (12C)-- 127 (12D)-- 128 (12E)-- 129 (12F(E-.08))--130	4-11-4 4-11-5 4-11-6 4-11-7 4-11-8 4-11-25 4-11-26
13	131 132 133 134	4-11-9 4-11-10
14	135	4-11-11
15	136 137 138 139	4-11-12 4-11-13 4-11-27 4-11-28
16	140 141 142 143 151 152 153 154 155 156 168	4-11-14 4-11-15 4-11-16 4-11-17 4-11-18 4-11-19 4-11-20 4-11-21 4-11-22 4-11-23

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
17	146	4-11-2
18	147 148	4-11-1
19	150	4-13-11
20	157(N-.88)	4-11-24
21	160 161	4-13-8 4-13-15
22	157(S-.12) 163 164 165 166 167	4-13-5 4-13-6 4-13-7
23	170	4-12-1
24	171	4-13-4 4-13-14
25	172	4-13-3
26	173 174	4-13-2
27	175	4-13-1
28	177	4-12-7

KEY: DESTINATIONS  
Page Four

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
29	179	4-12-5 4-12-6
30	180	4-12-4
31	181 182	4-12-2
32	185	4-6-4
33	186	4-6-5
34	187(S-.5) 189 190 191	4-5-10 4-5-11 4-5-13
35	197 198	4-6-6 4-6-7
36	201	4-6-10
37	202 203 204 205	4-6-12 4-6-13 4-6-14
38	206	4-6-15
39	207 208 209	4-6-16 4-6-17
40	210 211	4-6-18 4-6-20

KEY: DESTINATIONS  
Page Five

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
41 <sup>4</sup>	213	4-7-2
	214	4-7-3
	215	
	217	
	218	
42	219	4-7-4
	220	4-7-5
	221	4-7-6
	222	4-7-7
	223	4-7-8
	224	4-7-9
	225	4-7-10
	226	4-7-11
	227	4-7-12
	228	
	229	
	230	
	231	
	232	
	233	
	234	
	235	
236		
237		
43	239	4-4-21
44	242	4-4-19
	243	4-4-20
45	244	4-4-11
	245	
46	188	4-5-9
	249(NW-.8)	
	250	
	251	
	252	
	258(E-.5)	
	259	
	260	
	261	
	262	

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
47	253 254 255 256 257 258(W-.5)	4-5-8
48	263 264 265 266 267 268 269 (W-.5)	4-5-7
49	270(W-.7) 277	4-5-1 4-5-2 4-5-3
50	269(E-.5) 271 272 273	4-5-5 4-5-6
51	270(E-.3) 274 275 276	4-5-4
52	280 281	4-4-3 4-4-6
53	247 248 249(SE-.2) 282 283 284 285 286	4-4-0 4-4-7 4-4-8 4-4-9 4-4-10



KEY: DESTINATIONS  
Page Seven

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
54	179(SW-.12) 287	4-1-1 4-1-2 4-1-3
55	279(NE-.88) 288 289	4-4-1 4-4-2 4-4-4 4-4-5
56	292 293	4-4-12
57	294 295	4-4-13
58	296 297	4-4-14 4-4-15
59	298 314 315	4-4-16 4-4-17
60	299 300 301 310(NE-.3)	4-1-10 4-1-11
61	302 309(E-.6) 310(NW-.35)	4-1-8 4-1-9 4-1-12 4-1-13
62	303 309(W-.4)	4-1-14 4-2-1 4-2-11 4-2-12 4-2-13

KEY: DESTINATIONS

I-8

Page Eight

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
63	304	4-2-2
	305	4-2-3
	306	4-2-5
	307	
64	308	4-2-6
		4-2-7
		4-2-8
		4-2-9
		4-2-10
65	310(S-.35)	4-1-17
	311(W-.02)	
66	311(E-.98)	4-1-0
	312	4-1-16
	318	
67	313	4-1-15
68	319	4-1-18
	320	
	322	
	323	
	324	
	325	
69	326	4-9-2
70	329	4-9-3
71	337	4-9-5
	338	4-9-6
	339	4-9-7

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
72	344 345 346	4-9-11 4-9-12 4-9-13
73	347 348	4-3-6 4-3-7
74	321 350	4-3-1 4-3-3
75	349 351	4-3-0 4-3-2 4-3-4 4-3-5
76 <sup>5</sup>	89 90	1-2-216
77	466(N-.4)	3-1-5
78	469(NE-.5)	3-1-2
79	475	3-2-1
80	480	3-2-8
81	482 484 485 486 487 489	1-2-214 1-2-215 1-2-217

<sup>5</sup>Associated VCU's: 91, 92

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
82 <sup>6</sup>	492	1-2-204
	493	
	494	
	495	
	496	
	497	
<hr/>		
83	524	1-2-200
	526	
<hr/>		
84	527	2-1-1
<hr/>		
85 <sup>7</sup>	529	2-1-11
	530	2-1-12
	532	2-1-13
	534	
	534.1	
	535	
	538	
	539	
	540	
<hr/>		
86	531(S-.2)	2-2-20
	536(S-.6)	2-2-40
	537(SW-.2)	2-2-41
	541	
	542	
	543	
	544	
	545	
	546	
	547	
	548	
	549(W-.4)	
	555(SW-.05)	

<sup>6</sup>Associated VCU's: 498, 499, 500.

<sup>7</sup>Associated VCU's: 533, 550.

KEY: DESTINATIONS  
Page Eleven

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
87 <sup>8</sup>	551	2-2-43
87A <sup>9</sup>	552 572	NA
88	557(E-.5)	2-1-109
89	558 559 561 562 563 570	2-2-11 2-2-12 2-2-45
90	567	2-3-70 2-3-82
91	568	2-3-80
92	575 576 578 579 580 586 596 597	2-1-28
93	583 584 585	2-1-40

<sup>8</sup>Associated VCU: 553.

<sup>9</sup>Associated VCU's: 573, 574, 577.

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
94 <sup>10</sup>	598	2-1-30
	599	2-1-31
	600	
	601	
	602	
	603	
	604	
	607	
	612	
	614	
	618	
	619	
	620	
	NF (Kasaan)	
<hr/>		
95 <sup>11</sup>	610	2-1-29
	611	2-1-34
	621	
	622 (E-.05)	
<hr/>		
96 <sup>12</sup>	NF	2-1-82
		2-1-83
		2-1-89
		2-1-90
<hr/>		
97	629	2-3-84
<hr/>		
98	630	2-1-92
<hr/>		

<sup>10</sup>Associated VCU's: 605, 606, 608.

<sup>11</sup>Associated VCU: 622.

<sup>12</sup>Associated VCU: 623.

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
99	633 634 635 636 637(W-.7)	2-3-83
100	637(E-.3) 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 866 NF	2-4-1
101	674(E-.8) 675 676 677 678 679	2-1-44

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
102 <sup>13</sup>	672(E-.2) 673 674(W-.2) 685 686 687 688 689 690 696 697 705 706 707 NF	2-1-49 2-1-61
103	713(S-.33) 714	1-1-185
104	715 716	1-1-179
105	719 723	1-1-195 1-1-196
106 <sup>14</sup>	720	1-2-206
107	722	1-1-193
108	731(S-.67) 732 733 734 735 781	1-1-124

<sup>13</sup>Associated VCU: 698.

<sup>14</sup>Associated VCU: 718.



<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
109	736 737	1-1-123
110	738 739 740	1-1-122
111	741 742	1-1-121 1-1-128
112	743	1-1-129
113	744 745 746 753 758	1-1-106 1-1-132
114	747 748	1-1-133
115	749 750 751 752 NF	1-1-116 1-1-117 1-1-118
116	754 755 756 757 759	1-1-131
117	761 762 763 764 765 NF	1-1-138 1-1-139 1-1-140 1-1-141 1-1-142

KEY: DESTINATIONS  
Page Sixteen

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
118	864	1-1-119 1-1-120
119	NF	1-1-105
120	767	1-1-101
121	768	1-1-112
122	760 769	1-1-135
123	770 771 772 773 774 775 820	1-1-134 1-1-136 1-1-137
124 <sup>15</sup>	818 819 822 823 824 825 826	1-1-156
125 <sup>16</sup>	827 828 829 832 833 834 836 837 840 841 860	1-1-149

<sup>15</sup>

Associated VCU's: 815, 816, 817, 867.

<sup>16</sup>

Associated VCU's: 835, 838, 839, 842.

KEY: DESTINATIONS  
Page Seventeen

<u>Destination</u>	<u>VCU's</u>	<u>GMU, Subunit &amp; Area</u>
126	367 368 369 370	5-8-1 5-10-0
127	NF	5-8-7

APPENDIX II

Appendix II

Hunting Effort by Origin

Juneau

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
12	227	15.2
6	214	14.3
16	123	8.2
7	86	5.8
13	86	5.8
15	85	5.7
11	76	5.1
42	70	4.7
5	61	4.1
23	60	4.0
4	38	2.5
41	37	2.5
18	29	1.9
14	28	1.9
31	28	1.9
51	22	1.5
66	21	1.4
47	19	1.3
48	12	0.8
17	11	0.7
19	11	0.7
24	11	0.7
34	9	0.6
38	9	0.6
114	9	0.6
20	8	0.5
22	8	0.5
50	7	0.5
2	5	0.3
62	5	0.3
71	5	0.3
32	4	0.3
39	4	0.3
53	4	0.3
55	4	0.3
96	4	0.3
8	3	0.2
33	3	0.2
43	3	0.2
45	3	0.2
60	3	0.2
61	3	0.2
75	3	0.2
100	3	0.2
10	2	0.1
25	2	0.1
28	2	0.1
37	2	0.1
40	2	0.1
46	2	0.1

Con't Hunting Effort by Origin

Juneau

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
58	2	0.1
59	2	0.1
67	2	0.1
68	2	0.1
72	2	0.1
74	2	0.1
78	2	0.1
9	1	0.1
76	1	0.1
80	1	0.1
82	1	0.1
85	1	0.1
<hr/>		
TOTAL	1495	

Angoon

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
22	9	42.9
24	7	33.3
21	2	9.5
40	2	9.5
25	1	4.8
<hr/>		
TOTAL	21	

Elfin Cove

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
34	3	75.0
66	1	25.0
<hr/>		
TOTAL	4	

Gustavus

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
32	8	50.0
6	3	18.8
7	2	12.5
33	2	12.5
16	1	6.3
<hr/>		
TOTAL	16	

Con't Hunting Effort by Origin

Haines

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
12	8	30.8
5	5	19.2
16	5	19.2
23	2	7.7
1	1	3.8
32	1	3.8
46	1	3.8
48	1	3.8
60	1	3.8
79	1	3.8
<hr/>		
TOTAL	26	

Skagway

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
12	1	50.0
117	1	50.0
<hr/>		
TOTAL	2	

Hoonah

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
37	15	24.2
38	15	24.2
32	8	12.9
39	8	12.9
35	4	6.5
17	2	3.2
34	2	3.2
36	2	3.2
15	1	1.6
21	1	1.6
40	1	1.6
60	1	1.6
66	1	1.6
68	1	1.6
<hr/>		
TOTAL	62	

Pelican

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
47	18	41.9
46	14	32.6
48	11	25.6
<hr/>		
TOTAL	43	

Con't Hunting Effort by Origin

Tenakee

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
42	22	95.7
41	1	4.3
<hr/>		
TOTAL	23	

Port Alexander

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
71	3	100.0
<hr/>		
TOTAL	3	

Kake

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
31	8	66.7
29	3	25.0
30	1	8.3
<hr/>		
TOTAL	12	

Sitka

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
66	219	19.1
68	120	10.5
60	115	10.1
67	95	8.3
62	94	8.2
61	78	6.8
75	46	4.0
54	33	2.9
56	32	2.8
63	30	2.6
64	30	2.6
53	29	2.5
72	22	1.9
55	21	1.8
73	20	1.7
45	19	1.7
51	19	1.7
65	16	1.4
44	15	1.3
50	14	1.2
52	14	1.2
48	11	1.0
74	8	0.7



Con't Hunting Effort by Origin

II-5

Con't Sitka

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
71	7	0.6
39	6	0.5
41	5	0.4
59	4	0.3
22	3	0.3
42	3	0.3
58	3	0.3
46	2	0.2
87	2	0.2
117	2	0.2
1	1	0.1
5	1	0.1
12	1	0.1
37	1	0.1
49	1	0.1
57	1	0.1
69	1	0.1
<hr/>		
TOTAL	1144	

Petersburg

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
31	65	36.3
23	20	11.2
30	20	11.2
15	16	8.9
81	14	7.8
16	6	3.4
59	6	3.4
28	4	2.2
51	4	2.2
113	4	2.2
62	3	1.7
61	2	1.1
71	2	1.1
25	1	0.6
26	1	0.6
27	1	0.6
32	1	0.6
38	1	0.6
57	1	0.6
58	1	0.6
76	1	0.6
77	1	0.6
82	1	0.6
85	1	0.6
90	1	0.6
96	1	0.6
<hr/>		
TOTAL	179	

Con't Hunting Effort by Origin

Wrangell

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
106	12	11.9
79	9	8.9
5	7	6.9
15	7	6.9
31	7	6.9
70	7	6.9
82	5	5.0
93	5	5.0
37	4	4.0
51	4	4.0
66	4	4.0
53	3	3.0
113	3	3.0
16	2	2.0
27	2	2.0
62	2	2.0
72	2	2.0
83	2	2.0
85	2	2.0
89	2	2.0
91	2	2.0
96	2	2.0
11	1	1.0
26	1	1.0
38	1	1.0
41	1	1.0
42	1	1.0
60	1	1.0
<hr/>		
TOTAL	101	

Point Baker

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
85	4	44.4
71	2	22.2
69	1	11.1
70	1	11.1
84	1	11.1
<hr/>		
TOTAL	9	

Con't Hunting Effort by Origin

II-7

Craig/Klawock

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
89	12	30.0
96	7	17.5
86	6	15.0
95	6	15.0
117	4	10.0
99	2	5.0
6	1	2.5
97	1	2.5
100	1	2.5
<hr/>		
TOTAL	40	

Hydaberg

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
99	1	100.0
<hr/>		
TOTAL	1	

Meyer's Chuck

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
112	2	100.0
<hr/>		
TOTAL	2	

Ketchikan

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
117	218	27.2
115	132	16.5
114	72	9.0
113	61	7.6
110	31	3.9
111	27	3.4
116	26	3.2
118	25	3.1
109	21	2.6
89	15	1.9
94	13	1.6
92	11	1.4
122	11	1.4
104	10	1.2
86	9	1.1
66	8	1.0
85	8	1.0
101	8	1.0
95	7	0.9

Con't Hunting Effort by Origin

Con't Ketchikan

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
105	7	0.9
21	6	0.7
108	6	0.7
112	6	0.7
119	6	0.7
55	4	0.5
87	4	0.5
87A	4	0.5
88	4	0.5
102	4	0.5
107	4	0.5
72	3	0.4
84	3	0.4
99	3	0.4
103	3	0.4
16	2	0.2
23	2	0.2
42	2	0.2
51	2	0.2
53	2	0.2
123	2	0.2
124	2	0.2
20	1	0.1
34	1	0.1
47	1	0.1
49	1	0.1
50	1	0.1
63	1	0.1
120	1	0.1
121	1	0.1
<hr/>		
TOTAL	802	

Annette I.

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
119	8	47.1
120	3	17.6
117	2	11.8
66	1	5.9
101	1	5.9
114	1	5.9
125	1	5.9
<hr/>		
TOTAL	17	

Con't Hunting Effort by Origin

II-9

Yakutat

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
13	4	26.7
16	4	26.7
31	3	20.0
126	3	20.0
127	1	6.7
<hr/>		
TOTAL	15	

Misc. S.E.

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
92	50	60.2
66	9	10.8
12	7	8.4
109	3	3.6
60	2	2.4
67	2	2.4
71	2	2.4
113	2	2.4
114	2	2.4
115	2	2.4
6	1	1.2
51	1	1.2
<hr/>		
TOTAL	83	

Other Alaska

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
42	32	19.9
66	17	10.6
31	15	9.3
115	11	6.8
23	8	5.0
16	7	4.3
51	7	4.3
15	6	3.7
46	5	3.1
5	4	2.5
12	4	2.5
13	4	2.5
18	4	2.5
74	4	2.5
6	3	1.9
38	3	1.9
53	3	1.9
79	3	1.9
98	3	1.9
8	2	1.2
2	1	0.6
32	1	0.6

Con't Hunting Effort by Origin

Con't Other Alaska

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
33	1	0.6
37	1	0.6
50	1	0.6
55	1	0.6
59	1	0.6
60	1	0.6
62	1	0.6
63	1	0.6
65	1	0.6
67	1	0.6
100	1	0.6
113	1	0.6
114	1	0.6
126	1	0.6
<hr/>		
TOTAL	161	

Other U.S.

<u>Destination</u>	<u># Hunts</u>	<u>%</u>
16	13	14.4
46	12	13.3
66	11	12.2
115	6	6.7
50	5	5.6
6	4	4.4
23	4	4.4
64	4	4.4
72	4	4.4
113	3	3.3
13	2	2.2
18	2	2.2
42	2	2.2
60	2	2.2
63	2	2.2
67	2	2.2
81	2	2.2
5	1	1.1
56	1	1.1
61	1	1.1
65	1	1.1
68	1	1.1
82	1	1.1
85	1	1.1
86	1	1.1
96	1	1.1
126	1	1.1
<hr/>		
TOTAL	90	

APPENDIX III







Destination	Total Effort	Juneau	Angoon	Elfin Cove	Gustavus	Haines	Skagway	Hoonah	Pelican	Tenakee	Sitka	Port Alexander	Kake	Petersburg	Wrangell	Pt. Baker	Craig/Klawock	Hydaburg	Meyer's Chuck	Ketchikan	Annette Island	Yakutat	Other Alaska	Other U.S.	Misc. Southeast	Unknown	
63	34										30																
64	34										30																
65	18										16																
66	292	21		1				1		219	95				4						8	1		17	11	9	
67	102	2						1		120	1										1	1	1	2	2	2	
68	124	2									1																
69	2																										
70	8																										
71	21										7	3		2											4	2	
72	33										22																
73	20										20																
74	14										8																
75	49										46																
76	2																										
77	1																										
78	2																										
79	13																										
80	1																										
81	16																										
82	8																										
83	2																										
84	4																										
85	17																										
86	18																										
87	6																										
87A	4																										
88	4																										
89	30																										
90	1																										
91	2																										
92	61																										
93	5																										

50



III-5

TOTALS: 4358 1495 21 4 16 26 2 62 43 23 1144 3 12 179 101 9 40 1 2 802 17 15 161 90 83 7

Destination	Total Effort
121	1
122	11
123	2
124	2
125	1
126	5
127	1
Juneau	
Angoon	
Elfin Cove	
Gustavus	
Haines	
Skagway	
Hoonah	
Pelican	
Tenakee	
Sitka	
Port Alexander	
Kake	
Petersburg	
Wrangell	
Pt. Baker	
Craig/Klawock	
Hydaburg	
Meyer's Chuck	
Ketchikan	1
Annette Island	1
Yakutat	3
Other Alaska	1
Other U.S.	1
Misc. Southeast	
Unknown	

APPENDIX IV

Appendix IV

Computer Recode Statements

A. Creating Hunter Origins from Zip Codes

LIST DEERORIG

0010IF::(A3 EQ 99998 OR A3 LT 99500) A25=26  
0020IF::(A3 EQ 99821 OR 99824 OR (A3 GE 99801 AND  
0025::LE 99808)) A25=1  
0030IF::(A3 EQ 99820) A25 = 2  
0040IF::(A3 EQ 99825) A25=3  
0050IF::(A3 EQ 99826) A25 = 4  
0060IF::(A3 EQ 99827) A25 = 5  
0070IF::(A3 EQ 99840) A25 = 6  
0080IF::(A3 EQ 99829) A25=7  
0090IF::(A3 EQ 99832) A25 = 8  
0100IF::(A3 EQ 99841) A25 = 9  
0110IF::(A3 EQ 99835) A25 = 10  
0120IF::(A3 EQ 99834) A25 = 11  
0130IF::(A3 EQ 99830) A25 = 12  
0140IF::(A3 EQ 99833) A25 = 13  
0150IF::(A3 EQ 99929) A25 = 14  
0160IF::(A3 EQ 99927) A25 = 15  
0170IF::(A3 EQ 99921 OR 99925) A25 = 16  
0180IF::(A3 EQ 99922) A25 =17  
0190IF::(A3 EQ 99903) A25 =18  
0200IF::(A3 EQ 99901 OR 99928) A25 =19  
0210IF::(A3 EQ 99920 OR 99926) A25 = 20  
0220IF::(A3 EQ 99850 OR 99950) A25 = 22  
0230IF::(A3 EQ 99828 OR 99831 OR 99836 OR 99838 OR  
0240::99882 OR 99907) A25 = 23  
0250IF::(A3 EQ 98733 OR 98737 OR 98742 OR 98790 OR  
0260::(A3 GE 99500 AND LE 99800)) A25=24  
0280IF::(A3 EQ 99997) A25 = 25  
0290IF::(A3 EQ 99689) A25 = 21  
0300IF::(A3 EQ 99999) A25 = 27  
0310MISSING VALUES A25(0)  
0320VAR LABELS:A25, ORIGINS  
0330VALUE LABELS:A25 (1)JUNEAU (2)ANGOON (3)ELFIN COVE  
0340::(4)GUSTAVUS (5)HAINES (6)SKAGWAY  
0350::(7)HOONAH (8)PELICAN (9)TENAKEE (10)SITKA  
0360::(11)PORT ALEXANDER  
0370::(12)KAKE (13)PETERSBERG (14)WRANGELL  
0380::(15)PT BAKER (16)CRAIG (17)HYDABERG  
0390::(18)MEYERS CHUCK (19)KETCHIKAN  
0400::(20)ANNETTE ISLAND (21)YAKUTAT  
0410::(22)SMALL SE TOWNS  
0420::(23)UNKNDWN SE (24)OTHER AK (25)UNKNOWN AK  
0430::(26)OTHER US (27)FOREIGN (0)MISSING

B. Creating Hunting Destinations from  
ADF&G Hunt Location Data

## LIST DEERDEST

0010IF::(A20 EQ 1 AND A22 EQ 477) A24=1  
 0020IF::(A20 EQ 1 AND A22 EQ 401) A24=10  
 0030IF::(A20 EQ 1 AND A22 EQ 367) A24=2  
 0040IF::(A20 EQ 1 AND A22 EQ 360) A24=11  
 0050IF::(A20 EQ 1 AND A22 EQ 359) A24=4  
 0060IF::(A20 EQ 1 AND (A22 EQ 342 OR 345 OR 347  
 0070::OR 357)) A24=5  
 0080IF::(A20 EQ 1 AND (A22 EQ 337 OR 341)) A24=7  
 0090IF::(A20 EQ 1 AND (A22 EQ 334 OR 335)) A24=6  
 0100IF::(A20 EQ 1 AND A22 EQ 331) A24=8  
 0110IF::(A20 EQ 1 AND A22 EQ 303) A24=9  
 0120IF::(A20 EQ 1 AND (A22 EQ 214 OR 215 OR 217)) A24=81  
 0130IF::(A20 EQ 1 AND A22 EQ 216) A24=76  
 0140IF::(A20 EQ 1 AND A22 EQ 206) A24=106  
 0150IF::(A20 EQ 1 AND A22 EQ 204) A24=82  
 0160IF::(A20 EQ 1 AND A22 EQ 200) A24=83  
 0170IF::(A20 EQ 1 AND (A22 EQ 195 OR 196)) A24=105  
 0180IF::(A20 EQ 1 AND A22 EQ 193) A24=107  
 0190IF::(A20 EQ 1 AND A22 EQ 185) A24=103  
 0200IF::(A20 EQ 1 AND A22 EQ 179) A24=104  
 0210IF::(A20 EQ 1 AND A22 EQ 156) A24=124  
 0220IF::(A20 EQ 1 AND (A22 GE 138 AND LE 142)) A24=117  
 0230IF::(A20 EQ 1 AND (A22 EQ 134 OR 136 OR 137))  
 0240::A24=123  
 0250IF::(A20 EQ 1 AND A22 EQ 135) A24=122  
 0260IF::(A20 EQ 1 AND A22 EQ 133) A24=114  
 0270IF::(A20 EQ 1 AND (A22 EQ 106 OR 132)) A24=113  
 0280IF::(A20 EQ 1 AND A22 EQ 131) A24=116  
 0290IF::(A20 EQ 1 AND A22 EQ 129) A24=112  
 0300IF::(A20 EQ 1 AND (A22 EQ 121 OR 128)) A24=111  
 0310IF::(A20 EQ 1 AND A22 EQ 124) A24=108  
 0320IF::(A20 EQ 1 AND A22 EQ 123) A24=109  
 0330IF::(A20 EQ 1 AND A22 EQ 122) A24=110  
 0340IF::(A20 EQ 1 AND (A22 EQ 119 OR 120)) A24=118  
 0350IF::(A20 EQ 1 AND (A22 EQ 116 OR 117 OR 118))  
 0360::A24=115  
 0370IF::(A20 EQ 1 AND A22 EQ 112) A24=121  
 0380IF::(A20 EQ 1 AND A22 EQ 101) A24=120  
 0390IF::(A20 EQ 1 AND A22 EQ 105) A24=119  
 0410IF::(A20 EQ 2 AND A21 EQ 1 AND A22 EQ 1) A24=84  
 0420IF::(A20 EQ 2 AND A21 EQ 1 AND (A22 EQ 11 OR  
 0430::12 OR 13)) A24=85  
 0440IF::(A20 EQ 2 AND A21 EQ 1 AND A22 EQ 28)  
 0450::A24=92

0460IF::(A20 EQ 2 AND A21 EQ 1 AND (A22 EQ 29 OR  
 0470::34)) A24=95  
 0480IF::(A20 EQ 2 AND A21 EQ 1 AND (A22 EQ 30 OR  
 0490::31)) A24=94  
 0500IF::(A20 EQ 2 AND A21 EQ 1 AND A22 EQ 40) A24=93  
 0505IF::(A20 EQ 2 AND A21 EQ 1 AND A22 EQ 44) A24=101  
 0510IF::(A20 EQ 2 AND A21 EQ 1 AND (A22 EQ 49 OR  
 0520::61)) A24=102  
 0530IF::(A20 EQ 2 AND A21 EQ 1 AND (A22 EQ 82 OR  
 0540::83 OR 89 OR 90)) A24=96  
 0550IF::(A20 EQ 2 AND A21 EQ 1 AND A22 EQ 92) A24=98  
 0560IF::(A20 EQ 2 AND A21 EQ 1 AND A22 EQ 109) A24=88  
 0570IF::(A20 EQ 2 AND A21 EQ 2 AND (A22 EQ 11 OR  
 0580::12 OR 45)) A24=89  
 0590IF::(A20 EQ 2 AND A21 EQ 2 AND (A22 EQ 20 OR  
 0600::49 OR 91)) A24=86  
 0610IF::(A20 EQ 2 AND A21 EQ 2 AND A22 EQ 43) A24=87  
 0620IF::(A20 EQ 2 AND A21 EQ 3 AND (A22 EQ 70 OR  
 0630::82)) A24=90  
 0640IF::(A20 EQ 2 AND A21 EQ 3 AND A22 EQ 80) A24=91  
 0650IF::(A20 EQ 2 AND A21 EQ 3 AND A22 EQ 83) A24=99  
 0660IF::(A20 EQ 2 AND A21 EQ 3 AND A22 EQ 84) A24=97  
 0670IF::(A20 EQ 2 AND A21 EQ 4 AND A22 EQ 1) A24=100  
 0680IF::(A20 EQ 3 AND A21 EQ 1 AND A22 EQ 2) A24=78  
 0690IF::(A20 EQ 3 AND A21 EQ 1 AND A22 EQ 5) A24=77  
 0700IF::(A20 EQ 3 AND A21 EQ 2 AND A22 EQ 1) A24=79  
 0710IF::(A20 EQ 3 AND A21 EQ 2 AND A22 EQ 8) A24=80  
 0720IF::(A20 EQ 4 AND A21 EQ 1 AND (A22 EQ 0 OR  
 0730::16)) A24=66  
 0740IF::(A20 EQ 4 AND A21 EQ 1 AND (A22 EQ 1 OR  
 0750::2 OR 3)) A24=54  
 0760IF::(A20 EQ 4 AND A21 EQ 1 AND (A22 EQ 10 OR  
 0770::11)) A24=60  
 0780IF::(A20 EQ 4 AND A21 EQ 1 AND A22 EQ 15) A24=67  
 0790IF::(A20 EQ 4 AND A21 EQ 1 AND A22 EQ 18) A24=68  
 0800IF::(A20 EQ 4 AND A21 EQ 1 AND (A22 EQ 8 OR  
 0810::9 OR 12 OR 13)) A24=61  
 0820IF::(A20 EQ 4 AND A21 EQ 1 AND A22 EQ 17) A24=65  
 0830IF::(A20 EQ 4 AND A21 EQ 2 AND (A22 EQ 1 OR  
 0840::11 OR 12 OR 13)) A24=62  
 0850IF::(A20 EQ 4 AND A21 EQ 1 AND A22 EQ 14) A24=62  
 0860IF::(A20 EQ 4 AND A21 EQ 2 AND (A22 EQ 2 OR  
 0870::3 OR 5)) A24=63  
 0880IF::(A20 EQ 4 AND A21 EQ 2 AND (A22 EQ 6 OR  
 0890::7 OR 9 OR 8 OR 10)) A24=64  
 0900IF::(A20 EQ 4 AND A21 EQ 3 AND (A22 EQ 0 OR  
 0910::2 OR 4 OR 5)) A24=75  
 0920IF::(A20 EQ 4 AND A21 EQ 3 AND (A22 EQ 1 OR



0930::3)) A24=74  
 0940IF::(A20 EQ 4 AND A21 EQ 3 AND (A22 EQ 6 OR  
 0950::7)) A24=73  
 0960IF::(A20 EQ 4 AND A21 EQ 4 AND (A22 EQ 1 OR  
 0970::2 OR 4 OR 5)) A24=55  
 0980IF::(A20 EQ 4 AND A21 EQ 4 AND (A22 EQ 3 OR  
 0990::6)) A24=52  
 1000IF::(A20 EQ 4 AND A21 EQ 4 AND (A22 EQ 0 OR  
 1010::7 OR 8 OR 9 OR 10)) A24=53  
 1020IF::(A20 EQ 4 AND A21 EQ 4 AND A22 EQ 11)  
 1030::A24=45  
 1040IF::(A20 EQ 4 AND A21 EQ 4 AND A22 EQ 12) A24=56  
 1050IF::(A20 EQ 4 AND A21 EQ 4 AND A22 EQ 13) A24=57  
 1080IF::(A20 EQ 4 AND A21 EQ 4 AND (A22 EQ 14 OR 15))  
 1090::A24=58  
 1100IF::(A20 EQ 4 AND A21 EQ 4 AND (A22 EQ 16 OR 17))  
 1110::A24=59  
 1120IF::(A20 EQ 4 AND A21 EQ 4 AND (A22 EQ 19 OR 20))  
 1130::A24=44  
 1140IF::(A20 EQ 4 AND A21 EQ 4 AND A22 EQ 21) A24=43  
 1150IF::(A20 EQ 4 AND A21 EQ 5 AND (A22 EQ 1 OR  
 1160::2 OR 3)) A24=49  
 1170IF::(A20 EQ 4 AND A21 EQ 5 AND A22 EQ 4) A24=51  
 1180IF::(A20 EQ 4 AND A21 EQ 5 AND (A22 EQ 5 OR 6))  
 1190::A24=50  
 1200IF::(A20 EQ 4 AND A21 EQ 5 AND A22 EQ 7) A24=48  
 1210IF::(A20 EQ 4 AND A21 EQ 5 AND A22 EQ 8) A24=47  
 1220IF::(A20 EQ 4 AND A21 EQ 5 AND A22 EQ 9) A24=46  
 1230IF::(A20 EQ 4 AND A21 EQ 5 AND (A22 EQ 10 OR  
 1240::11 OR 13)) A24=34  
 1250IF::(A20 EQ 4 AND A21 EQ 6 AND A22 EQ 4) A24=32  
 1260IF::(A20 EQ 4 AND A21 EQ 6 AND A22 EQ 5) A24=33  
 1270IF::(A20 EQ 4 AND A21 EQ 6 AND (A22 EQ 6 OR 7))  
 1280::A24=35  
 1290IF::(A20 EQ 4 AND A21 EQ 6 AND A22 EQ 10) A24=36  
 1300IF::(A20 EQ 4 AND A21 EQ 6 AND (A22 EQ 12 OR  
 1310::13 OR 14)) A24=37  
 1320IF::(A20 EQ 4 AND A21 EQ 6 AND A22 EQ 15) A24=38  
 1330IF::(A20 EQ 4 AND A21 EQ 6 AND (A22 EQ 16 OR 17))  
 1340::A24=39  
 1350IF::(A20 EQ 4 AND A21 EQ 6 AND (A22 EQ 18 OR 20))  
 1360::A24=40  
 1370IF::(A20 EQ 4 AND A21 EQ 7 AND (A22 EQ 2 OR 3))  
 1380::A24=41  
 1390IF::(A20 EQ 4 AND A21 EQ 7 AND (A22 GE 4  
 1400::AND LE 12)) A24=42

1410IF::(A20 EQ 4 AND A21 EQ 9 AND A22 EQ 2) A24=69  
 1420IF::(A20 EQ 4 AND A21 EQ 9 AND A22 EQ 3) A24=70  
 1430IF::(A20 EQ 4 AND A21 EQ 9 AND (A22 EQ 5 OR  
 1440::16 OR 7)) A24=71  
 1450IF::(A20 EQ 4 AND A21 EQ 9 AND (A22 EQ 11 OR  
 1460::12 OR 13)) A24=72  
 1470IF::(A20 EQ 4 AND A21 EQ 11 AND A22 EQ 1) A24=18  
 1480IF::(A20 EQ 4 AND A21 EQ 11 AND A22 EQ 2) A24=17  
 1490IF::(A20 EQ 4 AND A21 EQ 11 AND (A22 EQ 4 OR  
 1500::5 OR 6 OR 7 OR 8 OR 25 OR 26)) A24=12  
 1510IF::(A20 EQ 4 AND A21 EQ 11 AND (A22 EQ 9 OR 10))  
 1520::A24=13  
 1530IF::(A20 EQ 4 AND A21 EQ 11 AND A22 EQ 11) A24=14  
 1540IF::(A20 EQ 4 AND A21 EQ 11 AND (A22 EQ 12 OR  
 1550::13 OR 17 OR 28)) A24=15  
 1560IF::(A20 EQ 4 AND A21 EQ 11 AND (A22 GE 14  
 1570::AND LE 23)) A24=16  
 1580IF::(A20 EQ 4 AND A21 EQ 11 AND A22 EQ 24) A24=20  
 1590IF::(A20 EQ 4 AND A21 EQ 12 AND A22 EQ 1) A24=23  
 1600IF::(A20 EQ 4 AND A21 EQ 12 AND A22 EQ 2) A24=31  
 1610IF::(A20 EQ 4 AND A21 EQ 12 AND A22 EQ 4) A24=30  
 1620IF::(A20 EQ 4 AND A21 EQ 12 AND (A22 EQ 5 OR 6))  
 1630::A24=29  
 1640IF::(A20 EQ 4 AND A21 EQ 12 AND A22 EQ 7) A24=28  
 1650IF::(A20 EQ 4 AND A21 EQ 13 AND A22 EQ 3) A24=25  
 1660IF::(A20 EQ 4 AND A21 EQ 13 AND A22 EQ 1) A24=27  
 1670IF::(A20 EQ 4 AND A21 EQ 13 AND A22 EQ 2) A24=26  
 1680IF::(A20 EQ 4 AND A21 EQ 13 AND (A22 EQ 4 OR 14))  
 1690::A24=24  
 1700IF::(A20 EQ 4 AND A21 EQ 13 AND (A22 EQ 5 OR  
 1710::6 OR 7)) A24=22  
 1720IF::(A20 EQ 4 AND A21 EQ 13 AND (A22 EQ 8 OR 15))  
 1730::A24=21  
 1740IF::(A20 EQ 4 AND A21 EQ 13 AND A22 EQ 11) A24=19  
 1750IF::(A20 EQ 1 AND A22 EQ 149) A24=125  
 1760IF::(A20 EQ 5 AND A21 EQ 8 AND A22 EQ 1) A24=126  
 1770IF::(A20 EQ 5 AND A21 EQ 10) A24=126  
 1780IF::(A20 EQ 5 AND A21 EQ 8 AND A22 EQ 7) A24=127  
 1800IF::(A20 EQ 1 AND A21 EQ 1 AND A22 EQ 10) A24=130  
 1810IF::(A20 EQ 1 AND A21 EQ 2 AND A22 EQ 10) A24=131  
 1820IF::(A20 EQ 1 AND A21 EQ 3 AND A22 EQ 10) A24=132  
 1830IF::(A20 EQ 1 AND A21 EQ 4 AND A22 EQ 10) A24=133  
 1840IF::(A20 EQ 1 AND A21 EQ 10) A24=134  
 1850IF::(A20 EQ 1 AND A22 EQ 333) A24=135  
 1860IF::(A20 EQ 1 AND A22 EQ 115) A24=136  
 1870IF::(A20 EQ 2 AND A21 EQ 1 AND A22 EQ 10) A24=137  
 1880IF::(A20 EQ 2 AND A21 EQ 10) A24=138  
 1890IF::(A20 EQ 2 AND A21 EQ 1 AND A22 EQ 22) A24=139

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1900IF::(A20 EQ 3 AND A21 EQ 10) A24=140
1910IF::(A20 EQ 4 AND A21 EQ 1 AND A22 EQ 7) A24=141
1920IF::(A20 EQ 4 AND A21 EQ 2 AND A22 EQ 0) A24=142
1930IF::(A20 EQ 4 AND A21 EQ 1 AND A22 EQ 6) A24=143
1940IF::(A20 EQ 4 AND A21 EQ 5 AND A22 EQ 0) A24=144
1950IF::(A20 EQ 4 AND A21 EQ 6 AND A22 EQ 19) A24=145
1960IF::(A20 EQ 4 AND A21 EQ 8 AND A22 EQ 0) A24=146
1979IF::(A20 EQ 4 AND A21 EQ 9 AND A22 EQ 0) A24=147
1980IF::(A20 EQ 4 AND A21 EQ 10 AND A22 EQ 0) A24=148
1990IF::(A20 EQ 4 AND A21 EQ 11 AND A22 EQ 0) A24=149
2000IF::(A20 EQ 4 AND A21 EQ 12 AND A22 EQ 0) A24=150
2010IF::(A20 EQ 4 AND A21 EQ 14 AND A22 EQ 0) A24=151
2020IF::(A20 EQ 4 AND A21 EQ 15 AND A22 EQ 0) A24=152
2030IF::(A20 GT 5) A24=129
3000MISSING VALUES A24(0)
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