HUNTER USAGE SURVEY

STEWART ISLAND

1980 - 81

A report prepared for the New Zealand Deerstalkers Association

by:-

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1983 update at rear

1. INTRODUCTION

A remit, "to initiate a survey of hunter usage and its effects on the economy of Stewart Island" was proposed by the Ashburton Branch of the New Zealand Deerstalkers Association and adopted at the Association's National Conference in July 1981. This report summarizes that survey. The authors opinions do not necessarily represent New Zealand Deerstalkers Association policy or opinion.

While comparative estimates have been made of hunters visiting Stewart Island, this is the first known attempt to survey hunters as a single group. The most recent study to be made of recreational users of the Island was the Land Management Study of Stewart Island, 1978 (Purey-Cust, McClymont).

Previous surveys by the Forest Service have been directed towards the deer populations which they consider as being too high. Deer reduction is being done by two methods; firstly on an experimental basis of using 1080 gel in selected blocks and secondly, by opening two blocks which are able to be hunted on an "open basis." All other hunting is on a one party per block system for control of hunters and safety.

The New Zealand Deerstalkers Association (N.Z.D.A.) accepts the principals of the Forest Service concerning the deer population. However, if the deer population is reduced to below that which will give a reasonable chance of success for visiting hunters, then hunters will be deterred and this in turn would affect the economy of Stewart Island. The Forest Service acknowledges the importance of whitetail deer, and in an article on whitetail deer on Stewart Island comments. "Within the realm of tourism the whitetail deer plays a vital role. If it was not for the presence of this animal, few hunters would bother to visit the Island and, in doing so, expend considerable amounts of money for transportation, equipment, and provisions." (Harris, N.Z.F.S.)

1280 hunters were estimated to have hunted on Stewart Island for the period of this survey. In the combined New Zealand Forest Service and Department of Lands and Survey report (1978), hunter opinion and usage only represented 5% of the people surveyed and did not take into account the extended time hunters spent on the Island.

Data from the questionnaire (pages 201 - 207 of the Land Management Study) did not cover a full twelve month period and reference to it is treated with caution.

2. STEWART ISLAND

1. History: New Zealand consists of three main islands lying approximately north to south of which Stewart Island is the smallest and the most southerly. Roughly triangular in shape it has an area of 1746km/2 and is seperated from the South Island by the 30km wide Foveaux Strait.

The main area of population is the settlement of Oban situated at the head of Halfmoon Bay. Between 1971 and 1976 the population increased by 23.9% to 513 but has remained static since that time (512 people 1981). However, the 1976 Census indicated the permanent population at approximately 400.

2. Employment: Of the population 43.3% has either full or part-time employment with half of the workers engaged in primary industry. The fishing industry directly or indirectly provides most of the employment opportunities. As with other primary industries, fishing has been severely affected by rising costs and in view of the Island's separation from the South Island, costs to the Island's fishing industry are that much higher. Since the future development of the fishing industry will depend on fishing the deeper waters, Stewart Island will probably not be in a position to take full advantage of the 320km economic zone.

Land Tenure, topography and difficulties associated with low natural soil fertility limit traditional agricultural opportunities. Low timber quality and access to remaining millable timber is also limited. Mining opportunities are largely unknown as to date no economic deposits of minerals are known to exist.

In the foreseeable future, tourism appears to offer the Island greater opportunities in terms of employment and development. Within tourism is hunting which is believed to contribute significantly to the Island's economy.

3. Vegetation: The main vegetation types can be summarised into lowland and alpine scrublands intermixed with boggy meadowland and swamp. In limited sheltered areas rain forest survives. For a more detailed classification of the vegetation, refer to appropriate references at the conclusion of this report.

4. Deer: In 1901, six red deer, and the following year an additional 22 were released at Paterson Inlet. A single liberation of whitetail deer was made in 1905 at Port Pegasus in the South of the Island. By the 1920's, the whitetail deer had become common throughout the Island.

Their preferential habitat is the coastal fringe. With the increase of hunting pressure they are now widely scattered over most of the Island. The red deer, although still present, never colonised the Island to the same extent as the whitetail or as they did on the North and South Islands of New Zealand.

The whitetail deer on Stewart Island represents the only herd of this species in adequate numbers in New Zealand to warrant the establishment of a recreational hunting area. The high recreational value of this animal is well known. The only other herd of whitetail deer in the southern Hemisphere is at the head of Lake Wakatipu and due to extremely low numbers, the Wakatipu herd has not the same opportunities for a recreational hunting area.

3. METHOD

All New Zealand hunting parties who uplifted a Stewart Island hunting permit during the period 1/7/80 to 30/6/81 were sent a questionnaire. While it would have been preferable to send all individuals a questionnaire, the lack of facilities, finance and the sheer bulk of numbers in addition to not knowing individual addresses are the main reasons to limiting the survey to all permitees. Only the initial questionnaire was distributed.

On November 16th 1981, 329 questionnaires were posted to locations throughout New Zealand. None were posted to overseas destinations. Upon receipt, each returned questionnaire was checked and sorted chronoligically. All information was accepted as correct unless it did not correspond to known values.

While there is no reason to disbelieve any of the data, it is possible, as in all surveys, for there to be a bias in the totals. Martinson and Whitsell (1964) concluded that hunting trip and game kill estimates derived from their questionnaire data were higher than known totals for those items.

Of the 329 questionnaires posted, 214 were returned in a usable form, four were incomplete for the last six questions and were discarded leaving a working total of 210. Within the unusable questionnaires, several were returned as undelivered and four were deleted for obviously falsified answers. Overall, the usable response was 63.8%.

All completed questionnaires returned by December 15, 1981, entitled the respondent to enter a Stewart Island hunting trip lottery which paid all expenses Invercargill return. While the incentive of a free hunting trip is open to criticism, it nevertheless overcame the problem of poor response that plagues surveys in general.

Table 1: Where the questionnaires were sent.

Location	Number sent	% sent by area	Number usable	% usable by area	% returned by location
Stewart Island	10	3.1	1	.5	10.0
Otago/Southland	158	48.0	93	44.3	58.9
Rest South Is.	86	26.1	67	31.9	77.9
All North Is.	75	22.8	49	23.3	65.3
Total	329	100.0	210	100.0	63.8

Most answers required entering ticks or numbers into the appropriate box. Opportunity was given for comments on all questions in addition to provision for comments to specific questions. The high interest generated by this survey is indicated by 94.8% of respondents that recorded comments.

4. AGE STRUCTURE OF HUNTING PARTIES

A total of 821 persons representing 210 parties were involved in the survey. For simplicity, age groups was divided into four classes.

Most hunters (66.8%) are represented in the 21 to 35 year age group with the 36 to 50 age group representing 21.1% of hunters. It was suprising that more hunters were not represented in the less than 20 year age group (7.2%); this could be partly explained by that groups general lack of hunting experience and the high cost involved in a hunting trip to Stewart Island.

A further 4.9% of hunters were older than 50 years.

5. TRANSPORT FROM SOUTH ISLAND TO STEWART ISLAND

There are several transport options taking hunters to Stewart Island, the methods used are explained in the following table.

Table 2: Methods of transport to Stewart Island. (n. Parties)

Hunting Parties From:-	Direct to Oban by - Ferry	Plane	Total direct to block	Total Parties
Otago/Southland	57	7	29	93
Rest South Is.	53	7	7	67
All North Is.	28	11	10	49
Total	138	25	46	209
%	66.0	12.0	22.0	100.0

This table was significant at 1%.

The majority of hunters (66%) preferred to use the ferry "Wairua" from Bluff to Stewart Island. An increasing number of North Island hunters flew from Invercargill to Oban. This may be due to aircraft/ferry arrival/departure times being unfavourable as well as the inconvenience of finding transport to Bluff from Invercargill airport. 22% of parties went direct either by plane or boat to their hunting block from South Island locations. All transport options to hunting blocks are explained in the following table.

Table 3: Methods of transport to hunting blocks. (n parties)

Hunting Parties From	To hunting blocks from South Island locations By Plane	By Boat	Oban Boat	Walk	Total
Stewart Island			1	0	1
Otago/Southland	12	17	62	2	93
Rest South Is.	1	6	56	4	67
All North Is.	9	1	34	5	49
Total	22	24	153	11	210
%	10.5	11.4	72.9	5.2	100.0

Those who flew direct to their hunting block from the South Island (10.5%) generally boarded their aircraft at Invercargill although a few other airports and farm strips were used as embarkation points. 11.4% went direct to their hunting block by fishing boat after boarding their transport at Bluff; one of this group boarded their boat at Riverton. However, not all departures in this group were by charter, 36% went by private boat. The majority of hunters (72.9%) went by charter boat from Oban to their hunting block. 95% of boat charter is by hunters (Hansen, pers coms).

6. ACCOMMODATION USED AT OBAN

Only 43.4% of hunting parties stayed at Oban. Those parties which stayed at Oban used:-

Accommodation Type	Number of Parties		Number of People	
Hotel	12	13.2%	36	11.6%
Motel	14	15.4%	50	16.2%
Camping ground	22	24.1%	92	29.8%
Private	38	41.8%	118	38.2%
Combination	5	5.5%	13	4.2%
Total	91		309	

The most popular choice of accommodation was the private option, where respondents stayed with friends on Stewart Island or did not use any of the options listed. Twice as many hunters stayed at the camping ground compared to the motel or hotel where similar numbers stayed. The combination category refers to five parties who used one accommodation type before going hunting and another type after hunting.

Table 4: Nights spent at Oban before and after hunting

Hunting Parties From:-	Before hunting	After hunting	Total nights	%
Otago/Southland	20	32	52	33.8
Rest South Is.	8	41	49	31.8
All North Is.	22	31	53	34.4
Total	50	104	154	
%	32.5	67.5		100.0

This table was significant at 5%.

Two-thirds of hunting parties preferred to spend nights at Oban after returning from hunting. North Island hunting parties tended to spend more nights at Oban with 41.5% and 58.5% staying before and after hunting respectively. Otago/Southland hunting parties spent a similar ratio as the overall mean of one-third staying before and two-thirds staying after hunting. 84% of rest of South Island hunting parties stayed at Oban after returning from hunting.

Comparing locations, total nights spent at Oban was similar (33.8, 31.8, 34.4% for Otago/Southland rest of South Island and all of North Island respectively).

Respondents were asked if accommodation at Oban was adequate to which 51.4% said yes and 29.5% replied as they did not use any accommodation it was inappropriate to answer. Accommodation was considered inadequate by 19.1%. The main reason cited for this dissatisfaction (or not using local accommodation) was the distance from the wharf to the accommodation of their choice as well as the price which was considered expensive. Distance applies in particular to the camping ground.

To encourage a greater number of hunters to stay at Oban, it is suggested an overall transport and accommodation package be considered. If organised inconjunction with the Forest Service and for the period of low hunter usage of June through to the end of October, this incentive may encourage hunters to those blocks or parts of blocks that are infrequently hunted or where deer numbers are considered too high.

7. PURCHASES AT OBAN

90% of hunting parties which stopped over at Oban made purchases of provisions, gifts and souvenirs and beverages. Some parties made quite substantial purchases of provisions at Oban. It would have been expected that the majority of hunting parties would have purchased their requirements on the South Island where they would have been cheaper. It is estimated that overseas hunters would purchase nearly 100% of their requirements on the Island.

As well as indicating what items were purchased, respondents were asked to indicate the approximate value of their purchases. 33% indicated they spent less than $25 with a similar percentage spending between $25 and $50. 34% of parties spent more than $50.

8. HUNTER CONTRIBUTION TO GOODS AND SERVICES

An object of this survey was to estimate the contribution hunters make to Stewart Island's economy, and the effect of an increase or decrease in the numbers of hunters coming to the Island to hunt.

Income from hunters can be classed as follows:-

1. Direct:
   (a) Charter boat fees from Oban to hunting blocks;
   (b) Accommodation;
   (c) Purchase of consumer items;
   (d) Miscellaneous, for example taxis, meals.
2. Indirect:
   For example, ferry, air and associated services based on the South Island. These services rely on the overall throughput of hunters and others to remain viable.

To obtain a true indication of the value of income to Stewart Island by hunters the amount of money spent was calculated on potential number of hunters. From known percentages, it is possible to estimate the numbers of hunting parties and hunters who would have used Stewart Island based services. While the total hunters in this survey is 821, it is estimated that the real total is 1280. This 1280 hunters does not include members of seven overseas hunting parties. Since questionnaires were sent to those who uplifted their Stewart Island hunting permit, this is a valid comparison. This estimation of income is from hunters only. Any major financial contribution from the other predominant user of the Island (the tramper) would be towards the purchase of provisions and use of accommodation. Charter boat transport is not used to any great extent by this group.

A total of 1280 hunters contributed directly or indirectly to Stewart Island's economy.

The value of services was calculated at:-
1. Charter boat; mean cost for actual parties.
2. Hotel; $33 per person per day.
3. Motel; $25 per night for two persons and $7 each additional adult.
4. Camping ground; $3 per person per night.
5. Consumer purchases as indicated by respondents.

Within the figures used, it is assumed that:-
- for the hotel; a full daily tariff was charged. Any tariff reduction would possibly be compensated by bar and other purchases.
- for the motel; that no additional charge was made for a stay of one night and users prepared their own meals;
- camping ground; all users cooked their own meals and did not hire transport to or from the camping ground.

72.9% of respondents (153 parties) went by charter boat to their hunting block from Oban. When calculated over 329 questionnaires represents a potential of 239 hunting parties using this means of transport. From the actual number of respondents it was calculated on average $152 was spent per party on boat charter. This represents $36,328.00.

Respondents were asked to indicate the estimated amount they paid for their purchases by marking one of three boxes. For category one (<$25), and two ($25 to $50) it was assumed that $25 and $50 was spent respectively, and for category three (>$50) that $70 was spent.

In total, the amount of money spent by hunters is estimated at:-

Charter boat	$36,328.00
Accommodation	$6,268.00
Purchases	$12,775.00
Total of	$55,371.00

Taking into consideration other direct income, plus indirect income, in real terms hunter contribution to Stewart Island's economy would be considerably greater than the $55,371.00 calculated to have been spent.

The effect of a 1% change in the number of hunters visiting Stewart Island represents $553 change in the amount of money spent by hunters on the Island. On a per capita basis on the estimated permanent population (400) represents $138 per person for the year of the survey. As 222 people are employed either part or full time on the Island (1976 Census), the expenditure by hunters is $249 per worker. As a result of the downturn in the fishing industry and of the limited opportunities for traditional employment, tourism and hunting are going to have to feature more prominately in the Island's economy. The extent to which hunting is able to continue to contribute to the Island's tourist economy will depend on Government policy and attitude towards this recreation.

9. VEGETATION

The question asking for personal opinion on the condition of the vegetation was, as intended, very subjective. The condition of the vegetation is paramount, not only for the vegetation types identified only to Stewart Island, but also for the vegetation's ability to sustain an animal population of white-tail deer.

The condition of the vegetation is currently compounded by coastal die-back (Velven and Stewart, 1980) on specific parts of the coast. This condition is thought to be caused by the increased level of wind carried salt. While coastal die-back is a relatively newly observed condtion, it has probably occured in the past long term history of the Island. The important difference is however, that there were then no deer.

The conflict is not between the animals present and coastal die-back, but on the animals and the regenerating vegetation. In those areas where coastal die-back is greatest, a relatively small number of animals could have an adverse effect on the regenerating palatable vegetation.

However, the effect of a comparison of an island (Bench) which has no introduced deer or opossums and Stewart Island which has deer and opossums must be biased in favour of the vegetation that is unmodified. Also, it is speculated as to why the greater emphasis is now being placed on the effect of the deer on the vegetation in view of greatly reduced numbers. Of concern to hunters in a survey of comparison between Bench and Stewart Island is that the effect of the deer is over emphasised portraying even an extremely low deer population as being detrimental to all regeneration.

The Forest Service attempts to define the deers' presence and density by vegetation and pellet surveys; the former probably over-estimates the effect of the deer on the vegetation and the later to over-estimate the deer population. This does not mean that techniques are not required to quantify vegetation condition and animal density. To hunters, as long as the vegetation appears to be healthy and showing minimual damage, the numbers will be "about right." If hunting is considered a viable use of Stewart Island the solution is of a compromise by the hunters and the botanists; the hunter to accept the lowest number of animals to give an acceptable hunting kill rate, the botanist to accept a slightly modified forest in a healthy regenerating state.

Respondents were asked for their personal opinion of how they ranked the vegetation. By far, the majority of respondents (71.0%) indicated the vegetation as good. 13.8% and 9.5% said the vegetation was improving and poor respectively. 3.3% said the vegetation was deteriorating; 2.4% expressed no comment.

Of the 149 parties that considered the vegetation as good, 59.1% considered the animal population to be about right and of that number 31.6% of respondents had members within their hunting party who had hunted on that block on previous occasions. This percentage (31.6%) is in line with the overall mean of members of parties who had at least one member who had hunted on that block previously (37.6%).

In the vegetation improving category, 47% of respondents had members who had hunted on that block on previous occasions; this is 9.4% above the overall mean. Many respondents commented on the lower number of animals and the vegetation being denser making hunting more difficult.

The overall impression from comments on the questions relating to the vegetation, is, that hunters recognise the importance of the vegetation.

10. ANIMALS SIGHTED

The question, "what was the total number of animals sighted by members of your party," resulted in a total sighting of 2809 animals. It must be stressed however, that the total number of deer sighted include multiple sightings of the same animal between one party and between all parties on the same and adjacent blocks.

The numbers of sightings was divided into six groups and by times of year as shown in the following tables.

Table 5: Number of parties sighting animals.

	Animal Sighting categories					
	Nil	1 - 5	6 - 10	11 - 15	16 - 25	26 + Animals
Party Numbers	10	55	51	39	26	29
%	4.8	26.2	24.3	18.5	12.4	13.8%

In the categorys of animals sighted, there was little difference between the two animal sighting groups of 1 - 5 and 6 - 10; the difference was only 1.9%. 39 parties (18.5%) sighted animals in the 11 - 15 category. Similar number of sightings occured within the last two groups, this difference was only 1.4%. A further 4.8% parties sighted no animals.

Table 6: Animals sighted for total parties by time of year.

Time of year	Total Parties	Total animals Sighted	Mean animals Sighted/Party	
M.A.M.	102	1587	15.56	a A
J.J.A.	33	403	12.21	abAB
S.O.N.	20	123	6.15	b B
D.J.F.	34	540	15.88	a A
Total	189	2653	14.03	
Unknown time of year	21	156	7.43	
Total	210	2809	13.38	

This table was significant at 1%; the unknown time of year was not included in the significance test.

In spite of ten parties not sighting any animals, the mean number of animals sighted over the known time of year ranged from 15.88 for December, January, February down to 6.15 animals sighted for September, October and November. The mean sighting for all parties was 13.38 animals. With the exception of the period September, October, November, it appears that the mean sighting of animals is approximately equal for the remainder of the year.

Of the 210 parties in this survey, 83.3% were successful in taking at least one animal. The test for significance between animals sighted and animals shot was significant at the 1% level.

Table 7: Time of year animals shot by sex.

Time of Year	Females	Males	Total Animals Shot	Mean	
M.A.M.	240	179	419	4.10	a AB
J.J.A.	36	39	75	2.27	b B
S.O.N.	17	21	38	1.90	b B
D.J.F.	90	73	163	4.79	a A
Total	383	312	695	3.68	
Unknown time of year	32	16	48	2.28	
Total	415	328	743	3.53	

Overall, 55.8% of the animals shot were females. An average of 3.53 animals were shot per hunting party.

The following table totals the number of hunters on each block with the number of animals sighted and shot. Total animals sighted and total hunters for each block have been expressed as a ratio to ensure a valid comparison between blocks; obviously, a greater number of hunters are more likely to observe a greater number of sightings. Animals shot to animals sighted have been expressed as a percentage.

It must again be emphasised the number of sightings include single and multiple sightings of animals within blocks by different parties (and possibly within parties) as well as sightings of the same animals between blocks for any time of the year. Also, it may not necessarily represent a similar sighting ratio over individual blocks and will not represent all animals present.

The table only represents those blocks for which there were sightings and not all blocks are included due to no sightings or no respondents hunting on blocks not mentioned.

Table 8: Hunters present to animals sighted, and percentage of animals shot to animals sighted.

Block	Number of hunters	Animals sighted	Ratio	Animals shot	% Animals sighted/shot
North Arm	8	18	1:2.25	4	22.2
Freshwater	5	19	1:3.80	6	31.6
Rakeahau	51	101	1:1.98	27	26.7
Doughboy	27	52	1:1.92	23	44.2
Little Hellfire	22	47	1:2.13	18	38.3
Big Hellfire	11	25	1:2.27	1	4.0
West Ruggedy	13	32	1:2.46	11	34.4
Long Harry	19	48	1:2.52	23	47.9
Smokey	15	68	1:4.53	11	16.2
Yankee	17	53	1:3.12	13	24.5
Lucky	37	128	1:3.46	42	32.8
Christmas	24	32	1:1.33	8	25.0
Murray	49	155	1:3.16	39	25.2
Bungaree	28	56	1:2.00	14	25.0
Maori	21	63	1:3.00	17	27.0
Abraham	44	103	1:2.34	27	26.2
Hapuatuna	3	5	1:1.67	0	0
North Glory	6	11	1:1.83	1	9.1
South Glory	38	43	1:1.13	9	20.9
Ocean Beach	10	5	1:0.50	1	20.0
Chew Tabacco	14	64	1:4.57	5	7.8
Pikarora	14	51	1:3.64	10	19.6
Port North	81	282	1:3.48	68	24.1
Kelly's	31	80	1:2.58	24	30.0
Shelter Point	31	100	1:3.23	35	35.0
Tikotatahi	88	567	1:6.44	154	27.2
Little Kuri	18	75	1:4.17	15	20.0
Big Kuri	18	83	1:4.61	20	24.1
North Lords	9	102	1:11.33	20	19.6
South Lords	45	277	1:6.16	72	26.0
Kaika	4	16	1:4.00	4	25.0
Unknown	20	48	1:2.40	21	43.8
Total	821	2809	1:3.40	743	26.5

Note: Mason was farmed Leasehold 1989 No hunting, until

From the table, eight blocks had a person/animal sighting ratio of less than 1:2.0 (inclusive) and an additional nine blocks with a ratio between 1:2.1 to 1:3.0. Of the seven blocks with a ratio greater than 1:4.1, 57% of those blocks had a ratio of less than 1:5.0. The remainder of this group (the blocks of Tikotatahi, North and South Lords) had ratios of 1:6.44, 11.33 and 6.16 respectively, well above the mean ratio of 1:3.4. Nine blocks had a ratio between 1:3.1 and 1:4.0.

The Land Management Study (1978) reports the Tikotatahi area as having a high deer population and is supported to some extent by this survey. However Tikotatahi had for this survey the highest number of hunters of all the blocks (10.7%). The ratio of 1:11.33 for North Lords may be artifically high as a result of the low use which this block received as well as its relatively small size.

Of the 32 blocks for which there were animals sighted and shot, 47% of the blocks had between 21% and 30% of the sighted animals shot. For the remaining 17 blocks, 9 (28%) blocks had less than 20% of the sighted animals shot. Only one block (Hapuatuna) had no animals shot with the highest percentage of sighted to animals shot at Long Harry (47.9%).

Tikotatahi, while having the second highest ratio of sightings to hunters present, had 27.2% of sighted animals shot which is .7% above the overall mean of 26.5%. The Rakiura Maori Land owners are aware (pers coms) of the higher deer numbers on some of their hunting blocks and have expressed their intention to encourage higher kill rates on those blocks.

It cannot be concluded that those blocks with the highest animal sightings are necessarily the best blocks to hunt. When compared to the number of hunters present and expressed as a ratio, the number of blocks with the ratio in excess of the overall mean ratio of 1:3.4 is twelve blocks (37.5%).

However, whether the kill rate of 26.5% animals sighted is sufficient reward for private hunting effort will depend whether it is the Forest Service's or the hunters point of view. The hunting effort of the private hunter cannot be compared to the professional culler of the Forest Service because the recreational hunter is engaged in the recreation of his choice and the the professional is paid to spend virtually the total hours of daylight hunting and to shoot all animals seen.

Perhaps the question could be asked; do hunters go to Stewart Island to hunt or to have a holiday? The Stewart Island Land Management Study (1978) on page 72 reports "The disadvantages of shooting are that generally in Stewart Island circumstances it is not successful," And continues, "Recreational hunters are on holiday, and usually either inexperienced or the quest for a trophy prevents them from shooting many animals."

It is not denied that hunters are on holiday; they are on holiday and participating in the recreation of their choice. But it must be emphasised that other factors greatly influence their success. Some of these factors include topography, animal and vegetation density, the weather and overall hunting condition of their block at particular times of the year. While those factors are mainly determined by conditions out of hunters control, factors within hunter control, particularly hunter experience, can greatly affect hunter success.

There is evidence to suggest hunter success in terms of animals shot is higher than five years ago. From table 1, page 145 of the Land Management Study (1978), for the period 1.4.75 to 1.4.76, for those parties that had returned their hunting permit (907 hunters representing 329 permits) indicated they had shot 314 animals. The total of 314 animals known to have been shot represented between 30 and 40% of permits issued that are returned to the Forest Service. Assuming a mean of 35%, implys 65% of permits are not returned. This is estimated to represent a total of 518 animals shot if all permits issued had been returned. For that study it represented.57 animals shot per hunter compared to this survey when an estimated 1280 hunters shot an estimated 1158 deer or .90 animals shot per hunter. Overall, hunters in this survey shot 2.23 times more animals than reported for the period 1.4.75 to 1.4.76.

As 84.0% of respondents indicated that the purpose of their hunting trip was for general hunting, and in view of the large numbers of deer shot of both sexes (415 females and 328 males) the comment of the Land Management Study that the "quest for a trophy prevents them (the recreational hunter) shooting many animals" cannot be entertained.

However, in view of reduced deer numbers, the increased kill rate represents a greater input from hunters, who while spending overall 55.5% of time hunting are now contributing more to animal control than previously, and, "while on holiday." Two other factors contribute to the kill rate. Firstly, in excess of one-third of hunters had hunted on that block previously, and secondly, 54.3% of hunters in our survey were on their second or more hunting trips to Stewart Island. Whether the Forest Service is prepared to capitalise on hunter experience and of the hunters contribution not only to Stewart Island's economy, but also to overall control efforts, will depend on the outcome of the 1080 poison trials which if successful will no doubt be employed over the majority of the hunting blocks if killing deer is the major criteria.

To what extent hunters are successful or unsuccessful in terms of animals shot depends on individual points of view. It is not suggested that at present hunting densities and at present hunting patterns that recreational hunters can alone keep deer to acceptable levels; and it may be necessary to supplement recreational hunting with other short term control methods. What extent other control methods are used depends on the encouragement and success of the hunters themselves and of the Forest Service to fully utilize the potential of recreational hunters.

Many long time hunters of Stewart Island expressed their concern at what to them appears to be a continual downward revision of acceptable numbers of deer. The Forest Service said ten years ago the numbers of deer were too high as was the case five years ago, and today deer numbers are still considered too high. These hunters suggest that tomorrow deer numbers will still be considered too high.

It is not disputed that if deer numbers are too high, then they have to be reduced, but, with improved scientific determinations of vegetation condition, the presence of animals are highlighted to an even greater extent. In turn this leads to a new round of animal reduction programmes. It is going to have to be determined as to what is an acceptable number of deer which on one hand has to satisfy the vegetation requirements of the environment and yet still ensure a reasonable level of hunter success.

11. NUMBER OF DAYS HUNTING

The majority of hunting parties (56.2%) spent between six and ten days on their hunting block. 24.8% of hunting parties spent between one and five days with an additional 19% spending more than eleven days on their hunting block. Only two parties in the survey spent more than fifteen days on their hunting block; the number of days in each case was 16 and 17 days.

The most popular time of year for hunting was during the period of March, April and May when 48.5% of the hunters visited the Island. That period co-incides with the rut and the best time to hunt for a trophy although only 16% of respondents indicated the primary purpose of their hunting trip was trophy hunting. June, July and August and December, January and February had approximately equal usage at 15.7 and 16.2% respectively. The period of lowest hunting was September, October and November (9.5%). The remaining 10% represents those parties which did not accurately identify the time of year they hunted.

The Forest Service is particularly keen to see more hunters visiting Stewart Island during the months of July and August. The Southland Conservator of Forest stated, "The climate on the Island does not have the winter/summer extremes of the Southern Alps and hunters can still expect reasonable weather at that time. Deer tend to be inland and hunters would need to adapt their methods away from the customary coastal hunting;" (N.Z.D.A. Circular to Branches of October 31, 1980).

Table 9: Mean days on block by location and time of year.

Time of Year	Stewart Island	Otago/ Southland	Rest South Island	North Island	Mean
M.A.M.	-	7.6	9.3	9.1	8.6
J.J.A.	-	7.0	7.7	7.4	7.3
S.O.N.	-	7.2	5.8	-	6.9
D.J.F.	7.0	7.2	8.1	8.3	7.8
Mean	7.0	7.3	8.5	8.7	8.1
Unknown time of year hunted	-	5.8	8.0	5.5	6.1
Overall mean	7.0	7.1	8.4	8.5	7.9

From the mean known time of year of hunting on Stewart Island, the time spent on hunting blocks increases with distance from Stewart Island with North Island hunters spending 1.4 more days than Otago/Southland hunters. Over the year Otago/Southland hunters spend on average 7.3 days on their block.

For hunters from the rest of the South Island, the variation is from a maximum of 9.3 days for March, April and May to a minimum of 5.8 days for September, October and November.

For all locations, the longest period spent on hunting blocks was during March, April and May (mean 8.6 days) with rest of South Island hunters spending .2 days more than North Island hunters. During this March to May period, Otago/Southland hunters spent 7.6 days hunting compared to 9.3 and 9.1 days for rest of South Island and North Island hunters respectively.

For June, July and August, the time spent hunting was similar at 7, 7.7 and 7.4 (mean 7.3 days) for Otago/Southland, rest of South Island and North Island respectively. There were no North Island hunters during September, October and November with Otago/Southland hunters spending 1.4 days longer than rest of South Island hunters.

During December, January and February, rest of South Island hunters spent on average one day more on their hunting blocks than Otago/Southland hunters.

Overall, Otago/Southland hunters tended to spend approximately 1.5 days less on their block than either rest of South Island or all North Island hunters. The one Stewart Island hunting party spent a mean of 7 days hunting.

While North Island hunting parties (49) are nearly half that of the other two locations (93 and 67 Otago/Southland and rest of South Island), North Island parties visiting Stewart Island are relatively evenly spread at 28.5% for a stay of 1 - 5 days, 40.8% for 6 - 10 days and 30.6% for a stay of 11 days or more. For Otago/Southland and rest of the South Island, 60 and 61% of hunting parties spend between 6 - 10 days respectively on hunting blocks; this is approximately 20% greater than the time spent by North Island hunters for the same duration. In view of the high travelling cost to Stewart Island, it would have been expected that a greater number of North Island hunters would have spent more than the 28.5% that only hunted for 1 - 5 days.

12. HUNTING BLOCK ACTIVITIES

Respondents were asked to indicate the percentage of time they allocated to the activities listed in the following table. The percentages for each party were converted into hours spent on each activity to avoid distortions for adding and averaging percentages. For ease of conversion, a ten hour day was used, and while this figure is debatable, and in view of the variation of daylight hours throughout the year, any figure is open to question. The actual hours spent hunting and hours spent per kill was not requested due to the great variation in the definition and interpretation of actual hours spent hunting.

Table 10: Percentage of time on activities by time of year.

	Time Of Year						
Activity	M.A.M.	J.J.A.	S.O.N.	D.J.F.	MEAN	UNKN.	MEAN
hunting	60.8	59.3	47.1	44.6	56.1	49.2	55.5
Fishing	14.4	18.0	17.2	20.4	16.4	20.9	16.8
Photography	4.2	2.8	4.2	7.8	4.6	2.5	4.4
Tramping	4.9	4.6	9.0	6.3	5.5	8.7	5.8
Lazing	11.4	12.2	18.5	16.0	13.2	14.7	13.3
Other	4.3	3.1	4.0	4.9	4.2	4.0	4.2

The mean for the known time of year of hunting at 56.1% gives subjectively an indication on the amount of time spent hunting, the variation of 16.2% from 44.6% to 60.8% does not consider climatic or other factors which may have prevented hunters spending more time hunting. One party reported to have had six days of southwest gales out of the eight days they spent on their hunting block.