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OFFICIAL HUNTING PATTERNS, AND TRENDS IN THE PROPORTIONS OF SIKA *(CERVUS NIPPON)* AND RED DEER (*C. ELAPHUS SCOTICUS)* IN THE KAWEKA RANGE, NEW ZEALAND, 1958-1988

Summary: Records of official deer control operations in the Kaweka Range between 1958 and 1988 have been used to describe the pattern of official hunting, to indicate changes in hunting efficiency, and to show trends in the proportions of sika and red deer in sympatric populations. The pattern of hunting largely reflected wild animal control priorities, and to some extent the resources available. Whereas hunting effort was concentrated in Block 1 (of three) during the 1960s to protect catchment values, changes in the rationale for wild animal control and the efforts of commercial and recreational hunters in the more accessible areas led to a more even spread of the hunting effort from the early 1970s. Hunting efficiency also varied between the three hunting blocks, probably reflecting differences in the ease with which particular habitats could be hunted. A decline in hunting efficiency over the study period was interpreted as an overall decrease in the density of the deer population. The proportion of sika among the deer shot in the Kaweka Range has increased steadily from about 10-20% in the early 1960s to 70% in 1987-88. A competitive advantage over red deer because of their different digestive physiology is suggested as the main reason. The most rapid increases in the proportion of sika were associated with two peaks in commercial venison and live-capture operations that concentrated on red deer, indicating that commercial hunting has also been a factor. It is likely that sika will continue increasing in proportion to red deer in areas already inhabited. In addition, sika will probably continue to disperse into new areas as they competitively displace red deer.

Keywords: sika deer; *Cervus nippon;* red deer; *Cervus elaphus scoticus;* dispersal; population density; hunting; Kaweka Range.

Introduction

Populations of sika deer *(Cervus nippon* Temminck) now occupying most forests and scrubland in the central North Island (Davidson, 1973) originated from a single release of six animals at Merrylees Clearing in the north-eastern Kaimanawa Range in 1905 (Wodzicki, 1950).)n contrast, populations of red deer (c. *elaphus scoticus* Lonnberg) in this area originated from numerous releases between 1883 and 1921 (Fig. 1; Logan and Harris, 1967). Throughout their range, which includes the Kaimanawa, Ahimanawa, and Kaweka Ranges (Davidson, 1990), sika are now sympatric with the more widely distributed red deer. Over much of the Kaweka Range populations of sika and red deer have been sympatric from as early as 1940, and possibly earlier (Davidson, 1973).

By the early 1920s deer populations in many areas of New Zealand had reached high densities resulting in considerable vegetation damage. Official animal control operations using foot-hunters began around 1930 and killed many hundreds of thousands of deer and other ungulates. At the peak of these operations in the 1950s over 100 hunters were employed and killed 40 000-60 000 deer a year (Challies, 1985). With the advent of commercial hunting in the early 1960s the scale of official control efforts declined. Nevertheless, official animal control continued until 1988 in some areas. including the Kaweka Range. Currently, harvesting by commercial and recreational hunters is the only form of management of deer populations in New Zealand.

The recent increase in the value of sika as a recreational and safari hunting resource has prompted a number of illegal liberations of sika well outside their current 'natural' range. Anecdotal evidence suggests that natural dispersal is also continuing. albeit slowly, into parts of the Urewera. Ruahine. and Hauhangaroa Ranges. Because of differences in their digestive physiology that allow sika to digest more fibrous, poorer quality forage than red deer (Hofmann. 1985). sika may have a competitive advantage over red deer in utilising the depleted vegetation present over most deer range in New Zealand. Therefore. it is conceivable that sika can reach higher densities and greater biomass in any

given area than red deer and, consequently, have a greater impact on the vegetation.

The potential problems associated with further dispersal and increase in numbers of sika highlight the need for more knowledge on the basic ecology and management of this species. This paper presents information from New Zealand Forest Service control operations directed at reducing the numbers of sika and red deer in the Kaweka Range. It is the only detailed scientific account dealing with official deer control operations, and as such it helps to illustrate the nature and scale of this facet of wild animal management in this country. Information on hunting patterns is used to illustrate changes in wild animal control priorities between 1958 and 1988, and data on hunting efficiency (kills/man-day) are used to indicate trends in deer population densities in the Kaweka Range during the 30-year period. Kill tallies from the official control operations are used to examine the trends in the proportions of the two species between 1958 and 1988. From this information the future relative status of sika and red deer in the central North Island is predicted.

Study area

The Kaweka Range forms an eastern extension of the main mountain axis of the North Island (Fig. 1). It is bounded by the Mohaka River in the north, and by the Ngaruroro River and its headwaters in the west and south. Information on the history, topography, geology, climate, and vegetation of the area is given in Elder (1959), Grant (1969), and Cunningham (1974). Grazing and browsing by sika, red deer, possums, cattle, sheep, and goats have had a considerable impact on the indigenous vegetation of the Kaweka Range (Elder, 1959).

The Kaweka Range has been divided into three official hunting blocks. These comprise part or all of the upper catchments of the three principal rivers which originate in the area, the Tutaekuri (Block 1), the Mohaka (Block 2), and the Ngarurоro (Block 3). The areas of the four main vegetation types (beech forest, scrubland, tussock grassland, and exotic forest) within each hunting block (measured from NZMS 262 maps using a geographical information system, TERRASOFT) vary considerably between the three

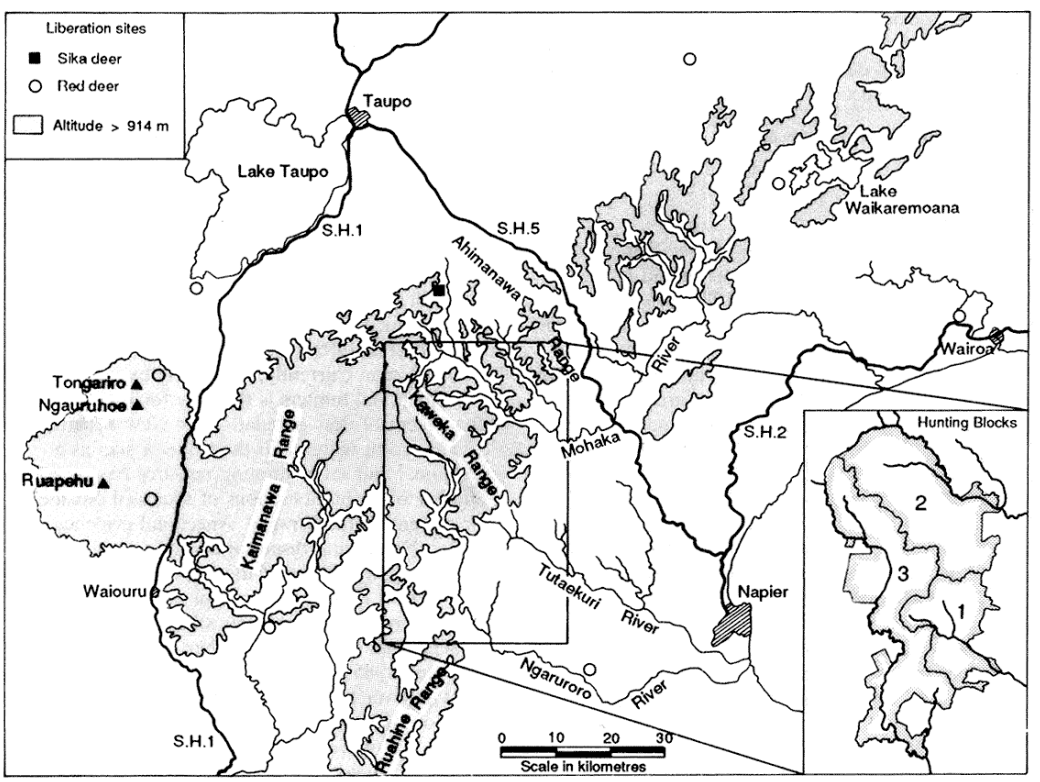

Figure 1: *Location of the Kaweka Range and its major catchments. the liberation point for sika, the nearest liberation points for red deer, and the location of the three hunting blocks (inset).*

Table 1: Areas *of the three* hunting *blocks and the percentages of the four main vegetation types,* within *each block and overall*.

Block	Area (ha)	Beech forest (%)	Scrubland (%)	Tussock grassland (%)	Exotic forest (%)
1 Tutaekuri	14383	21	39	12	28
2 Mohaka	27376	71	24	5	0
3 Ngaruroro	34874	40	36	18	6
Total	76633	47	33	12	8

hunting blocks (Table 1). Whereas Block 1 is mainly scrubland and exotic forest, Block 2 is predominantly beech forest. Block 3 is predominantly beech forest and scrubland, but also has a considerable area of tussock grasslands.

Methods

New Zealand Forest Service foot-hunters operated in the Kaweka Range from October to May every year from 1958 to 1988. Records for each hunting season include man-days hunted and numbers of sika and red deer killed from each block (Appendix 1). Experienced hunters were able to differentiate easily between the two species in the field (Davidson, 1973). Records of man-days hunted were not available for the 1958-59 hunting season; and for the 1960-61 and 1987-88 hunting seasons only the total number of man-days for all blocks combined was available.

Variation between the three hunting blocks in the proportions of sika and red deer shot and the number of deer killed per man-day was tested using standard ANOVA and LSD tests (Snedecor and Cochran, 1967). The raw percentages were used for all analyses as standard transformations failed to improve the normality of the data. The relationship between number of man-days hunted and number of deer killed was established using unweighted least squares linear regression with no intercept (Remington and Schork, 1970).

Results

Pattern of hunting

The number of man-days hunted (hunting effort) increased from initially low levels in 1959-60 to a peak of 1336 man-days in 1963-64 (Fig. 2). Hunting effort remained high until 1967-68 and then declined to 400-600 man-days each season until 1983-84. Hunting effort then declined further, reaching its lowest level (204 man-days) in 1987-88.

Hunting effort differed considerably between the three hunting blocks (Fig. 3). In 1959-60 more than 90% of official control was expended in Block 1. Although man-days were not available, the number of deer killed in each block indicates a similar effort for the 1958-59 hunting season (see Appendix I). However, hunting effort in Block 1 declined over the next few years until by 1964-65 this block received only about 30% of the total hunting effort. By 1972-73 this had declined further to less than 10%, and with the exception of 1973-74 (26%) and 1977-78 (21 %), remained low. Block 2 received little hunting effort in the first decade (20% each season) but markedly greater hunting effort between 1969-70 and 1976-77. Thereafter, hunting effort in Block 2 fluctuated between 15% and 35% of the season total. Except for the first 2-3 years, Block 3 almost consistently received the greatest hunting effort (typically 50% of the total hunting effort).

Figure 2: *Number of man-days hunted (dark shading) and number of deer killed (light shading) by official hunting in the Kaweka Range 1958-1988. *= data not available.*

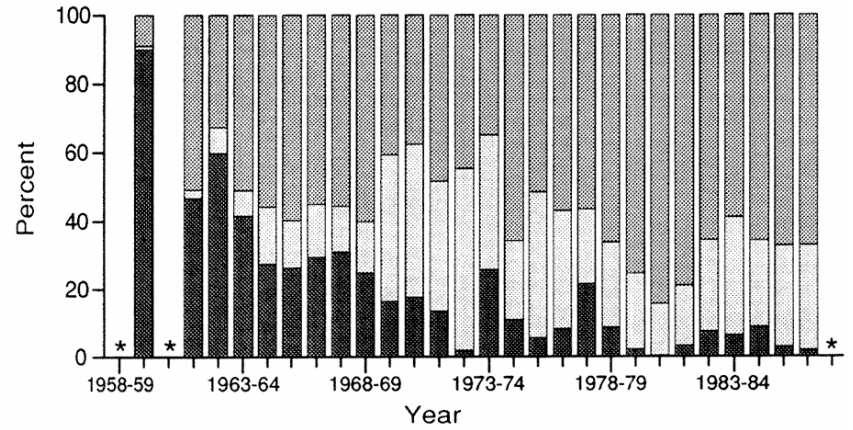

Figure 3*: Changes in the level of official hunting effort in the three hunting blocks; Block 1 - dark shading. Block 2 Ö light shading, Block 3 - medium shading. * =data not available.*

Relationship between numbers killed and hunting effort

Hunting effort and the number of deer killed were significantly correlated (r=0.95, p<0.001). The number of deer killed (both species pooled) increased over the early years to peak at 1271 deer killed in 1963-64 (see Fig. 2). Kills remained high (> 600 deer each hunting season) until 1972-73, but thereafter declined to much lower levels, especially from 1980-81 onwards. The number of deer killed per man-day (hunting efficiency) fluctuated widely during the period studied (Fig. 4), being highest during the decade 1968-69 to 1977-78 and lowest in the decade 1978-79 to 1987-88 (Table 2). The decade periods used in Table 2 conform largely to the main periods with substantial differences in the pattern of hunting. Hunting efficiency for all three blocks pooled varied from 2.06 kills/man-day (sika and red deer pooled) in 1959-60 to 0.49 kills per man-day in 1981-82. Before 1973-74, hunters shot on average one or more deer per day. However, after the 1973-74 hunting season usually fewer than one deer per day were killed. Since the kill tallies for sika and red deer in relation to man-days hunted are autocorrelated (i.e., the higher the sika tallies, the lower the red deer tallies), comparisons between the two species are invalid.

Overall, significantly fewer sika were killed per man-day in Block 3 and significantly fewer red deer in Block 1 (Table 3). With both species pooled the mean kills per man-day was significantly greater in Block 2 than Block 1. However, Block 3 was not significantly different from either Blocks 1 or 2. Although there were differences in hunting efficiency in each hunting block, the pattern for kills/man-day was similar in most hunting seasons. Notable exceptions were in 1959-60 when the kills/man-day were 0.59 for Block 1, 10.0 for Block 2, and 16.2 for Block 3, and in 1972-73 the kills/man-day in Block 1 were 5.4 in comparison with 1.4 for both Block 2 and Block 3. The actual hunting effort for these two hunting seasons was considerably greater in some blocks (see Discussion for explanation) than the number of man-days hunting recorded (Appendix 1). Thus, these years were omitted from the analysis.

Table 2: *Changes in hunting efficiency indicated by kills/man-day (both species pooled) between 1959-60 and 1987-88.*

Period	Mean no. man-days hunted	Mean no. deer killed	Mean no. kills/ man-day
1959-60 - 1967-68	820	780	1.06
1968-69 - 1977-78	552	628	1.14
1978-79 - 1987-88	448	322	0.74

Table 3*: Mean kills per man-day by block for each species and both species pooled between 1958 and 1988. Data for 1959-60 and 1972-73 have been omitted (see text for explanation). Mean values with the same superscript in each row are not significantly different (LSD test) at the p=0.05 level.*

	Mean kills/man-day				
	Block 1	Block 2	Block 3	F	p
Sika	0.40^{a}	0.38^{a}	0.25^{b}	3.38	<0.05
Red deer	0.38^{c}	0.68^{d}	0.71^{d}	5.98	<0.005
Both species	0.78^{e}	1.07^{f}	0.94^{ef}	3.49	<0.05

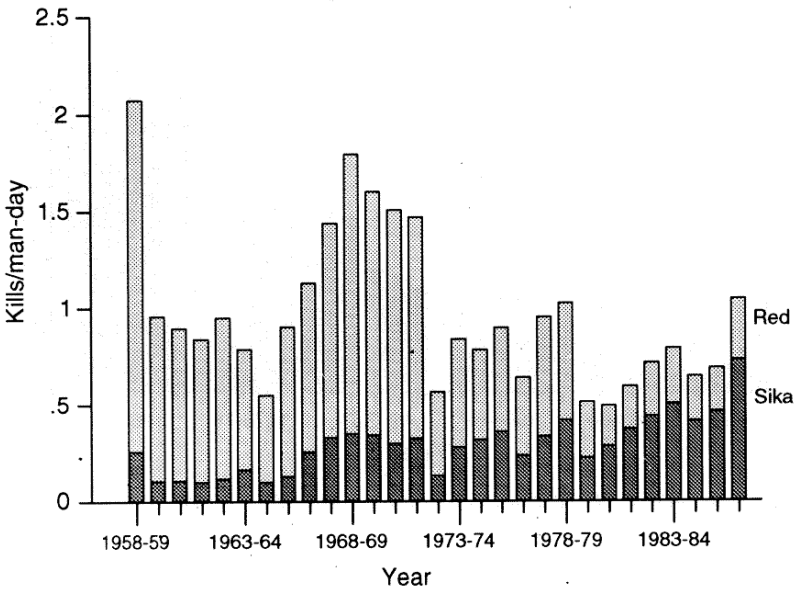

Figure 4: *Variation in the kills/man-day between 1958 and 1988 for sika and red deer.*

To test whether hunting efficiency in the three blocks may have been influenced by differences in the relative proportions of sika and red deer present, the data for hunting seasons with similar proportions of sika in all three hunting blocks were examined' more closely. In the 1977-78, 1979-80, and 1983-84 hunting
seasons similar proportions of sika were shot in 'all . three blocks, but only the 1977-78 season was considered because hunting effort was too. low in Block I for the other two seasons (see Appendix I). When orny a small hunting effort was expended, it is likely that the most 'productive' areas would have been targeted. The kills/man-day for the 1977-78 hunting season were consistent with the pattern of hunting efficiency for the 30-year period, being lower in Block 1 than in Blocks 2 and 3.

Sika: red deer ratios.

The proportion of sika shot during official hunting in the Kaweka Range increased from about 10-20% during the early 1960s to 70% in 1987-88 (Fig. 5). Although 32% of the deer shot in the 1958-59 season were sika, over 90% of all kills came from Block 1 as there was little or no official hunting that season in the other blocks. The overall rate of change in the proportion of sika has generally been slow, although between 1973-74 and 1975-76 the proportion of sika increased from 23% to 40%, and between 1980-81 and 1982-83 it increased from 44% to 63%.

Although the trend in all blocks was towards an overall increase in the proportion of sika shot, kill tallies from the individual hunting blocks differed considerably, particularly during the first decade. Block 1 generally yielded a greater proportion of sika, and Blocks 2 and 3 yielded similar proportions, except in the first decade when Block 3 produced consistently lower proportions of sika than Block 2 (Fig. 6). In Block 1 more than 50% of the deer shot were sika from as early as the 1974-75 season, but this proportion was not reached until 1981-82 in Blocks 2 and 3. In addition, the trend in Block 1 was markedly more erratic than in Blocks 2 and 3. Towards the end of the study period the proportion of sika shot became similar for the three hunting blocks.

Discussion

Pattern of hunting

Changes in the overall hunting effort during the 1958-1988 period and the variation in hunting effort between the hunting blocks largely reflects changing wild animal control priorities and to a lesser extent the resources available. During the initial years of this period goats, feral sheep: and pigs were ranked above deer for control in some parts of the Kaweka Range *(unpubl. New Zealand Forest Service reports).* Hunting effort was highest in Block 1 during the early years

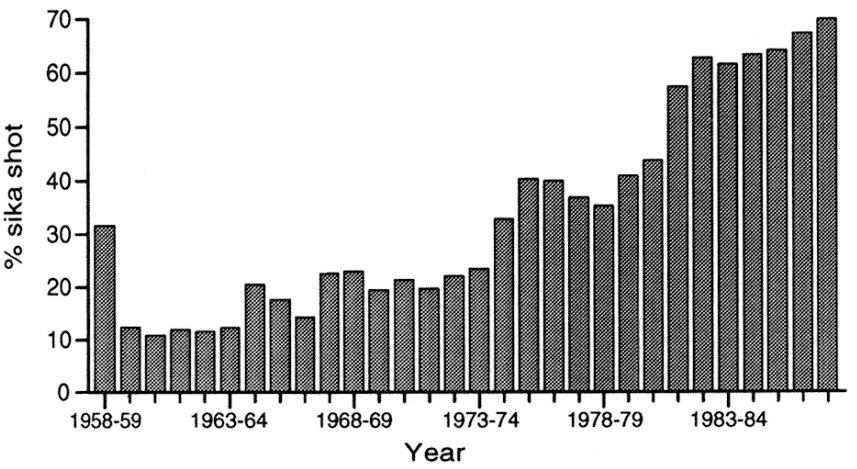

Figure 5*: Changes in the proportion of sika killed by official hunting between 1958 and 1988.*

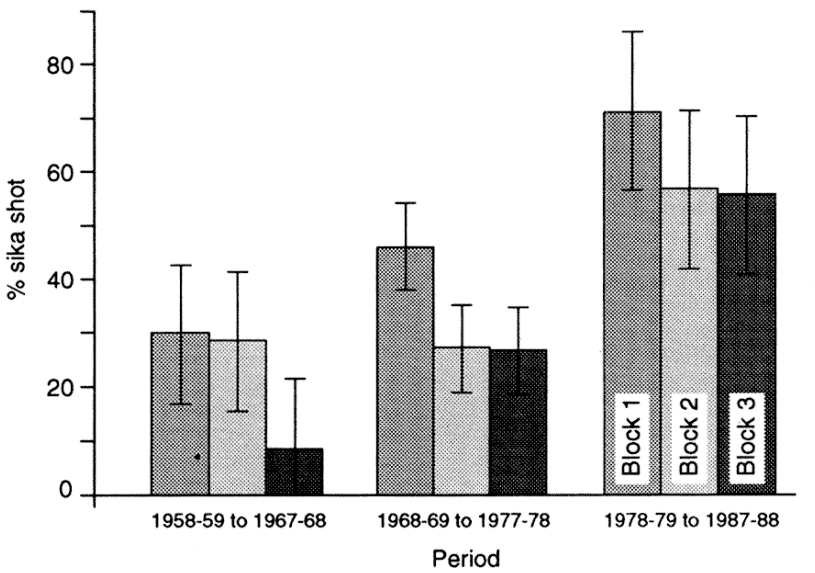

Figure 6: *Variation in the mean annual proportion (±LSD. p=0.05) of sika shot in the three hunting blocks during each decade between 1958 and 1988.*

because the Tutaekuri catchment had been identified as "critical" in terms of erosion and drainage processes and had a history of periodic and severe flooding (Cunningham, 1974). However, as animal numbers were reduced in Block 1 more effort was diverted into the other two hunting blocks. In addition, towards the end of the 1960s Cockayne's (1921) notion that modification of forests by deer could lead to their destruction was finally rejected, and evidence was presented to show that river bed aggradation and flooding were independent of the effects of deer and other introduced ungulates (Caughley, 1983).

Initially there was little or no official hunting in Block 2 because of an informal agreement between the Forest Service and the New Zealand Deerstalkers' Association (A.N. Gilmore, *pers. comm.).* At this time the Mohaka River area was a wilderness area with

poor access and no huts, and the Deerstalkers' Association requested it be set aside for recreational hunters only. However, as it became apparent that recreational hunters were having little effect on deer numbers the Forest Service increased the official hunting effort. During the early 1960s official hunting in Block 2 was poorly recorded. When government hunters "poached" in Block 2, they either added their tallies to their own hunting block or underscored the man-days hunted (AN. Gilmore, *pers. comm.)*. This helps to explain the high number of kills/man-day for the 1959-60 season in Block 2.

The greater hunting effort for Block 3 over much of the 1958-1988 period reflects not only the larger size *of* the block but also its relative remoteness in comparison with the other blocks. For this reason it generally received less recreational hunting pressure than Blocks 1 and 2.

The sharp decline in hunting effort after the 1967-68 season coincided with a rise in the price paid for venison. Many experienced government hunters left to shoot privately or to work for commercial operators, and finding suitable replacements was difficult (AN. Gilmore, *pers. comm.)*. The further reduction in olficial hunting effort from 1983-84 onwards reflects not only the declining resources available but also the reduced need for deer control in all but the most remote and heavily forested areas because of the activities of commercial and recreational hunters.

During the 1980s the attraction of sika to recreational hunters appears to have increased. Despite their comparatively limited distribution, they presently rank second behind red deer both in terms of the proportion of recreational hunters who hunt them (approximately 18%) and the proportion *of* the total recreational deer harvest they comprise (approximately 13%) (G. Nugent, *unpubl. data)*. Combined with this has been the increasing use of helicopters and small fixed-wing aircraft by recreational hunters to gain access to their hunting areas. The result has been a general increase in hunting pressure over much of the sika range, particularly in previously remote areas where access was difficult.

Relationship between numbers killed and hunting effort

Thc considerable fluctuation in hunting efficiency over the 30-year period resulted predominantly from changes in the pattern of hunting. In addition, the number of man-days hunted was not always directly related to deer kills. Feral sheep and goats were also shot, especially up until the late 19608 in Blocks 1 and 3. Further, Forest Service staff working on tracks and huts often hunted deer in their spare time. These "staff kills" were added to the tally sheets but the man-days hunted were not recorded. The relatively high number of kills/man-day in Block 1 during the 1972-73 hunting season was mainly the result of staff kills (AN. Gilmore, *pers. comm.)*.

The increased hunting efficiency in the late 1960s - early 1970s coincided with an increase in hunting effort in Block 2 and a decrease in Block 1. The predominant beech forest habitat and higher deer densities made Block 2 easier and more productive to hunt. In addition, less time was spent hunting other species such as feral sheep and goats *(unpubl. New Zealand Forest Service reports)*. This largely explains the observed differences in hunting efficiency between the blocks. Although comparisons of hunting efficiency between the three blocks are difficult, in the 1977-78 season when the ratios of sika:red deer were comparable the kills/man-day were also similar to the overall pattern for the 30-year period. This suggests that the relative proportions of sika and red deer present did not influence the overall hunting efficiency for the different blocks.

The general trend towards lower kills/man-day throughout the 1958-1988 period indicates that deer densities have decreased throughout the Kaweka Range. The most noticeable decline in the number of deer shot during official control operations occurred in the early to mid 19708, when venison prices and numbers of deer taken by commercial operators in New Zealand peaked (Caughley, 1983; Challies, 1985). This also coincided with an increase in the number of deer reported killed by recreational hunters in the Kaweka Range (K.W. Fraser, *unpubl. data)*. Around this time government foot-hunters were increasingly directed to the more remote and less accessible parts of the range (AN. Gilmore, *pers. comm.)*. A number of official aerial hunting operations also contributed to lower deer densities in the more open country.

Sika: red deer ratios

The differences in the proportion of sika shot in each block during the 1958-1988 period confirms known dispersal patterns of the species. Sika have spread mainly through scrublands and scrubland-forest ecotones (Davidson, 1973), such as the scrublands down the Mohaka Valley between the Ahimanawa and Kaweka Ranges, and along the forest edge of the eastern Kaweka Range (Elder, 1962). This helps to explain the higher proportion of sika in Block 1 during the early part of the period compared with Blocks 2 and 3, despite Block 2 being closer to the liberation point than Block 1. In addition, it is likely that Block 2 was well populated with red deer before sika spread into it. Dispersal into an area where a competitor species is present and food resources are

already depleted could be expected to be slower (Baker, 1978). This pattern is supported by the slower increase in the proportion of sika in Block 2 during the first 15 years of the period studied. In contrast, the more rapid build-up of sika in Block 1 can be partly attributed to the greater area of scrubland habitat in this block which was not favoured by red deer. The low proportions of sika in Block 3 during the early years of the study period indicate that this area was the most recently colonised.

The rutting roars of sika and red deer are easily distinguished. Comprehensive roar surveys in the Kaweka Range in 1962-63 and 1964-65 (Davidson, 1973) support the proportions of sika and red deer shot at that time. In 1962-63, 13% of roars heard were sika and this increased to 20% by 1964-65. The hunting data indicated that the proportion of sika increased from 12% to 21% during this time. The different patterns for individual hunting blocks are also supported by the roar data. Over 21% of the roars heard in Block I during 1962-63 and 1964-65 were sika compared with 16% and 10% in Blocks 2 and 3, respectively (d. 19%, 14%, and 14% for sika shot in Blocks 1,2, and 3, respectively, during the same time).

The proportions of sika and red deer shot should reflect the trends in the actual proportions of each species present in the sympatric populations. Although sika are generally considered to be more difficult to hunt than red deer for most hunters (Kiddie, 1962), it is unlikely that the government cullers showed any significant bias towards red deer in their kill tallies since most cullers had many years' experience (A.N. Gilmore, *pers. comm.)*. However, in later years there was a greater potential for bias with a high turnover of government hunters. The effect of any bias would be to underestimate the proportion of sika shot.

The steadily increasing proportion of sika during the 3D-year period can be explained. Firstly, sika may have a competitive advantage over the larger red deer in utilising the depleted vegetation present over much of the Kaweka Range because of their different digestive physiology (Hofmann, 1985). Secondly, commercial foot-hunters and aerial operators have taken red deer in preference to sika because of their greater body size and greater suitability for farming. The two phases of more rapid increase in the proportion of sika shot occurred immediately after periods of peak commercial activity. In the mid 1970s the increase from 23% to 40% sika shot followed the peak of venison prices (Caughley, 1983; Challies, 1985), and in the early 1980s the increase from 44% to 63% sika shot followed the boom period in live capture (Wallis and Hunn, 1982; Challies, 1985).

The trend observed in this study is also reflected elsewhere in New Zealand, where among sympatric deer species the smaller species has been more successful (e.g., white-tailed deer and red deer on Stewart Island, and red deer and wapiti in Fiordland; Challies, 1985).

Future trends

The trend of an increasing proportion of sika shot in the Kaweka Range is continuing. At the present rate the proportion of sika could reach 90% by the year 2000. It seems reasonable to assume that sika will continue to disperse naturally into new areas including the Urewera, Hauhangaroa, Ruahine, and Tararua Ranges by competitively displacing red deer, largely through their greater ability to utilise the available food resources. Studies on marked sika and red deer have revealed similar dispersal rates of 2.2 and 3.0 km/year respectively, although habitat differences and the presence of red deer may have restricted or slowed the dispersal of sika into some areas (Davidson, 1979). It is unclear whether commercial hunting will influence future dispersal patterns by preferentially taking more red deer, since the wild animal recovery industry is currently in decline. In addition, in view of the recent illegal liberations of sika into forested areas well outside their current range, geographical barriers may not prevent new areas being colonised. More information is required on sika diet and habitat preferences if the environmental effects of this increase in the proportion of sika and spread into new range are to be understood.

Although sika and red deer are known to hybridise (Lowe and Gardiner, 1975; Bartos, Zirovnicky and Hyanek, 1981), it appears to be relatively uncommon in New Zealand (Davidson, 1973). Further studies are required to determine the degree of hybridisation and what spatial relationships exist in local distribution. In view of the increasing importance of sika as a recreational and safari hunting resource, and the potential impact of their spread into new areas, an updated statement is needed on their current status and distribution in New Zealand.

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Appendix overleaf

Appendix 1: *Official hunting records for the Kaweka Range area, 1958-88 (n.a. = not available).*

	Block 1			Block 2			Block 3			All blocks pooled			
		kills			kills			kills			kills		
Hunting Season	Man-days	Sika	Red	Man-days	Sika	Red	Man-days	Sika	Red	Man-days	Sika	Red	Both species
1958-59	n.a.	110	230	n.a.	5	18	0	0	0	n.a.	115	248	363
1959-60	244	43	100	3	13	17	24	14	375	271	70	492	562
1960-61	n.a.	37	156	n.a.	0	0	n.a.	11	235	457	8	391	439
1961-62	328	33	79	17	11	6	357	32	470	702	76	555	631
1962-63	548	23	344	69	14	95	300	53	244	917	90	683	773
1963-64	555	71	208	99	29	116	682	57	790	1336	157	1114	1271
1964-65	244	82	99	149	18	110	496	45	349	889	145	558	703
1965-66	292	52	70	156	29	68	666	28	369	1114	109	507	616
1966-67	324	32	61	171	45	184	608	66	609	1103	143	854	997
1967-68	295	55	222	128	120	121	531	68	492	954	243	835	1078
1968-69	151	74	124	92	28	71	368	100	482	611	202	677	879
1969-70	91	29	79	238	93	322	227	72	401	556	194	802	996
1970-71	104	35	44	263	81	350	221	85	344	588	201	738	939
1971-72	65	24	29	184	48	194	234	72	360	483	144	583	727
1972-73	10	23	31	274	62	321	231	82	237	515	167	589	756
1973-74	116	14	46	177	14	83	158	32	67	451	60	196	256
1974-75	47	9	8	99	32	61	281	77	172	427	118	241	359
1975-76	37	17	3	276	90	173	335	99	128	648	206	304	510
1976-77	37	22	16	158	65	91	259	76	138	454	163	245	408
1977-78	150	39	47	153	43	75	396	83	161	699	165	283	448
1978-79	49	27	26	141	52	58	376	111	265	566	190	349	539
1979-80	11	4	9	103	39	75	352	152	198	466	195	282	477
1980-81	2	2	0	86	40	48	478	85	115	566	127	163	290
1981-82	19	10	1	104	57	52	465	99	70	588	166	123	289
1982-83	27	11	3	97	45	16	238	79	61	362	135	80	215
1983-84	38	21	13	205	104	68	350	136	82	593	261	163	424
1984-85	33	22	I	95	49	46	247	117	62	375	188	109	297
1985-86	10	3	6	101	45	25	230	93	48	341	141	79	220
1986.87	7	10	1	114	64	30	248	97	52	369	171	83	254
1987-88	n.a.	7	2	n.a.	49	35	n.a.	93	27	204	149	64	213
Totals	3834	941	2058	3752	1384	2929	9358	2214	7403	17605	4539	12390	6929