

# Chapter 42

## The Sika in New Zealand

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**Abstract** The first introduction of sika into New Zealand took place in 1885, but they failed to establish themselves in the open, snow-grass mountain ranges of the South Island. It appears another lot, not officially recorded, arrived around 1900, but was not released to the wild, and probably retained in one of the zoological enclosures. A gift of six animals to the New Zealand Government by the 11th Duke of Bedford in 1904 were eventually liberated in January 1905 in the Poronui area of the Kaimanawa Ranges that lie to the east of the North Island's Lake Taupo. This introduction was successful, and the herd now occupies a considerable range. It is believed the origin of these animals was of mixed genetics, involving at least two subspecies, perhaps as many as five, the number of races present at Woburn Abbey Park at the time of the presentation. Visual characteristics tend to suggest this to be the case. Once established, the herd's impact and relationship with the introduced European red deer (*Cervus elaphus*) in the same area has created some interesting observations and theories concerning the co-existing processes. Introduced with the view to sporting purposes, the stags of the herd have produced some outstanding sets of antlers, comparable with any sikine trophies from elsewhere in the world.

### Sika Introduction to New Zealand

During early days of British settlement in New Zealand, acclimatization societies were responsible for the import and establishment of mammals and birds, most of which were imported from the "Homeland." New Zealand had no indigenous land mammals other than the native bats. The following account for sika is lifted primarily from Banwell (1999).

The first sika to be introduced to New Zealand was in 1885 when three animals consisting of a male and two females were imported by John Bathgate, of Dunedin City and presented to the Otago Acclimatisation Society. According to Mavis Davidson (1998 personal communication), a New Zealand biologist who carried out a long-term study of the local sika, these animals were claimed to have come

from the Ussuri district of eastern Siberia and were recorded as survivors of a turbulent voyage from Manchuria on board a ship, the *Tamsui*. This information suggests they were probably of the Dybowski race, *Cervus nippon hortulorum*.

Liberation of these deer took place in the South Island on a property known as the Otekaieke Estate near the small township of Kurow, situated in North Otago's Waitaki Valley. By 1888 the group had increased to seven animals and by 1890 the local newspapers were stating their numbers as increasing, no doubt following along the lines of the Otago Acclimatisation Society's report that they "...were doing well and growing into a nice little herd." However, after 1892 little or nothing was heard of the Otekaieke deer.

It seems that in time, the increasing population became a nuisance to local farmers. The animals lived in a very open environment and, as a consequence, were eventually wiped out by the local settlers. As Mavis Davidson (1973) later remarked, it appears strange that the Society, which presumably had acquired the animals for recreational reasons, failed to monitor the progress of the herd very closely in relation to its welfare, herd structure, and trophy antler potential. As she pointed out at the time, there is little doubt that someone was aware of their fate, but the threat of prosecution created a conspiracy of silence.

Davidson (1973) then went on to state, "There are other possibilities as to the fate of at least some of these sika, the most likely scenario being of dispersal westwards. The main factors influencing dispersal are considered to be population pressures, or the innate urge of animals to leave their area of origin on reaching puberty. As it is very unlikely the Otekaieke sika ever came under any population pressures, any movement away from the region of origin would appear to be due to innate dispersal behavior, perhaps accelerated by local settler harassment."

Assuming they did, in fact, disperse, they could have then entered a hostile environment. The Otekaieke deer may not have thrived under such conditions above and away from the area of liberation, the region being quite mountainous and subject to adverse weather conditions, particularly during winter. Both Russian (Makovkin 1999) and Japanese (Takatsuki 1991) biologists agree with research carried out here in New Zealand, that sika tend to be predominantly grazers, the Russians proposing a steppe, or grass plain, as place of origin (Flerov 1952). In Far East Russia sika congregate in snow-free areas, unable to cope very well with heavy snow conditions (Makovkin 1999). Even in New Zealand's Kaweka Range, where the successfully introduced sika range today, it is claimed (Davidson 1973), that they migrate to lower reaches when the snow covers the "tops," or alternatively, to high elevation grasslands.

During the 1890s, human population to the west of the release area was rather sparse and a few deer could have escaped detection (Banwell 1999). Alternatively, a sighting would, undoubtedly, have inspired considerable comment. If perhaps, the log books of the old sheep stations behind the North Otago townships of Oamaru and Kurow had survived, it may have been possible to find some reference to the animals in question. In any event, they seemed to have disappeared not many years after their release.

It was after the turn of the century when sika were once again liberated in New Zealand (Donne 1924). In 1904, some six years after their importation into Woburn

Abbey, the then Duke of Bedford presented six head to the New Zealand government. At the time of the gifting it was claimed the six animals belonged to the Manchurian race, *Cervus nippon mantchuricus*. The genetic background of these six deer introduced to New Zealand has created great interest (Banwell 1995, 1999). Their descendants display a great diversity in morphological characteristics. However, sika are phenotypically variable and capable of producing quite a wide range of coloration and spotting, even within one particular subspecies, let alone in a group evolving from a mixture of races.

A study of the various introductions and relative variations in those races enclosed at Woburn Abbey, seat of the Dukes of Bedford, at the time in question and the stories that evidently circulated following the liberation of the animals in New Zealand, reveals some interesting facts (Glover 1956; Banwell 1999). In the manifest of deer held at Woburn Abbey during 1903, the year before the six animals were shipped to New Zealand, there were 106 "Japanese," 34 Manchurian, and 12 Formosan (Taiwan) sika in the park, making a total of 152 enclosed there. By 1904 the total had increased to 171. "Japanese" sika are recorded as having been acquisitioned by Woburn Abbey during 1894 from several different animal dealers, one from a Captain Marshall, five from a company calling itself W. Jamrach, two from a man named Cross, and one from the London Zoo, making a total import constituting two males and seven females.

Later that same year further acquisitions were effected from the property of Lord Powerscourt in Ireland. Powerscourt had been credited with having imported the first sika into Britain (as a matter of fact, the first into Europe) as early as 1860. These he had enclosed in his Powerscourt Park in Ireland's County Wicklow (Whitehead 1964). This first import, together with another consisting of a male and a female introduced to Regent's Park Zoological Gardens, are the earliest recorded introductions of sika into the European arena.

"Manchurian" sika arrived at Woburn Abbey during August 1894, one male and two females from the London-based dealers, W. Jamrach. By October of that year mortality had reduced the total to one individual. Nevertheless, by the end of 1897 the group had increased to ten, including three animals of the Formosan subspecies, by purchase of animals from a German firm, Carl Hagenbech.

It would appear the retention of records was rather imperfect over this particular period, as other sources of information reveal that there were small numbers of both Kerama, *Cervus nippon keramae*, and Dybowski's sika, *Cervus nippon hortulorum*, in the park as well (Whitehead 1972; Banwell 1995, 1999). It appears there were, in fact, at least five subspecies of sika at Woburn Abbey at the time of the delivery of the shipment to New Zealand and there is no evidence they had been separately enclosed (Glover 1956). Alternative sources of information, including Lydekker (1901) and Whitehead (1950), confirm the presence of the five forms. However, New Zealand historian, T. E. Donne (1924) presented the facts quite differently. As a consequence of this conflicting information, one can not separate fact from conjecture. This confused situation has led to the widely accepted conclusion that the New Zealand herd has arisen from a mixture of forms, claimed to be from a minimum of two and the possibility of all five subspecies present at Woburn at the time

(Davidson 1990; Banwell 1999). The least likely contributor is the Kerama, a diminutive form from the Ryukyu Islands, which can offer a considerable influence of total melanism. Nevertheless, it has been claimed that smaller, black animals have been sighted within the New Zealand sika range.

Whatever the case, it is generally accepted that the sika in this country are of mixed origin, most certainly influenced by genetics from both sides of the Sea of Japan, as is clearly evident in morphological and color variations, including antler configuration. The genetic background of the New Zealand sika is certainly an interesting subject and it is to be hoped that someday in the not too distant future, by the application of DNA, the true genetic sources will be determined.

The animals consigned to the New Zealand government from Woburn Abbey in 1904 comprised three of each sex and were shipped in five crates out of the London Docks on the *S. S. Kaikoura* under the command of Captain Reginald C. Clifford (Donne 1924). The sea journey took 70 days over which time they were fed on clover hay and carrots. Two calves were born at sea, only one surviving the journey. The ship docked at the Port of Wellington during early September 1904, where the animals were immediately placed in quarantine on Somes Island in Wellington Harbor. There they were to remain for the statutory six months.

In the *New Zealand Times* of January 18, 1905 it was reported, "...the half dozen pretty little Japanese deer that have been quarantined for the past six months on Somes Island, have at length obtained their release. The Tourist Department has dispatched them north and they are to be liberated on the Kaimanawa Range, about 15 miles south of Lake Taupo. The range is heavily timbered with open valleys and good water." Because the deer arrived in early September and were released in January it would seem the animals were excused from the full six months of quarantine.

The liberation took place in January 1905 at a place known as Merrylees Clearing (Donne 1924), part of which was then Taharua Station, a large farm property known today as Poronui (Fig. 42.1). It is situated on the eastern periphery of the North Island's Kaimanawa Forest Park. An unpublished Tourist Department report of events between 1900 and 1907 states that release of the three females and one male animal was successfully accomplished; two males were "lost" in the operation. By the word "lost," it can only be assumed they were killed or died of stress during the exercise. Mention was also made of two calves at foot the following year and the fact the "little hind" had failed to conceive that season. She almost certainly bred the following season and was undoubtedly the major key to the presence of the obvious "Japanese" element in the herd structure today (Banwell 1999).

Little information concerning the herd was recorded in the period between the release and when the first licenses to hunt were issued in 1925, particularly in regard to establishment and dispersal. In fact, this was the case up until protection of all introduced game animals was lifted in 1930, when the New Zealand Government saw fit to declare all such introduced species as "pests." Nevertheless, by 1930 the herd numbers had increased considerably and Davidson (1973) recorded an estimated dispersal rate of 0.6 km per year, assessed over the period of the initial 65 years. The rate of spread was probably underestimated in the early

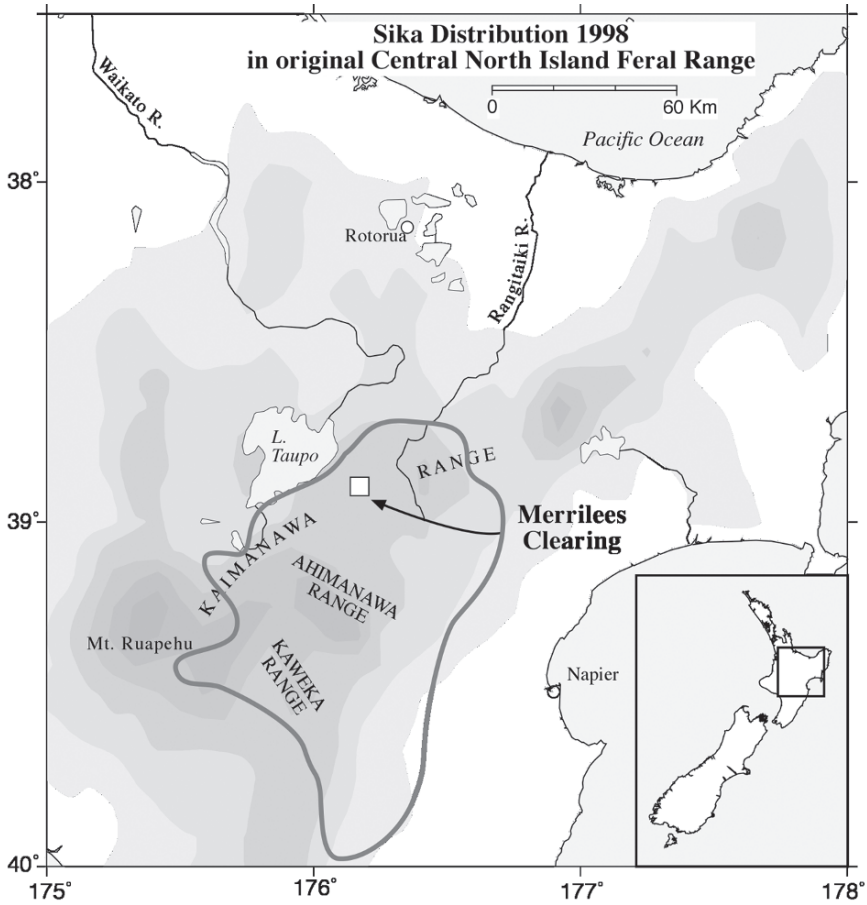


Fig. 42.1 Map of the North Island of New Zealand showing the site of release and the recent (as of 1998) distribution of sika in the wild.

years of establishment and ultimately slowed down over later years. Current distribution is shown in Fig. 42.1. Obviously, some of the animals remained in and around the area of the initial release, but before very long, as was anticipated, a proportion had spread to the north and west towards Tongariro National Park.

An interesting outcome in the establishment of this species is a claim relating to the fact that two distinctive types of sika now exist in specific areas of the herd's present range. There are those displaying the characteristics that suggest they are predominantly of a Chinese form, while in some pockets of the overall range, others distinctly resemble a Japanese form. The majority of the latter appear to have moved further eastwards towards the Hawkes Bay side of the range, while the Chinese characteristics seem more evident nearer the point of liberation and throughout the Kaimanawa Ranges. This may well suggest the Japanese form to be more aggressive and, as a result, dispersed more rapidly onto fresh domain.

Labeled as a “pest” in New Zealand, similar to all introduced fauna, regardless of its intrinsic value as a source of recreation, there have been several illegal translocations effected in quite recent years, some far beyond the natural spread and establishment of the main herd. These translocations threaten the purity of some of our red deer (*Cervus elaphus*), although it does not appear that hybridization is as widespread as some advocates claim. Nevertheless, such releases have potential grave consequences.

## Current Distribution

The spread and establishment of the original sika herd has not been as extensive as was first anticipated. During the years of 1929 and 1930, J. G. Holmes of the Tourist Department at the City of Rotorua, conducted a survey in which he set out to determine the status of axis deer (*Axis axis*) that had been unsuccessfully introduced to Tongariro National Park. He subsequently submitted a report during April of each year recording that his efforts proved to be unsuccessful in regard to the axis, but made mention of sika as having spread at least as far as the “bald tops” of the Kaimanawa Range by way of a track cut between the Waiotaka stream and the Tongariro River and had traveled along these open tops above the forest to a point past the Waipakihi stream. He had also surveyed the country above Tokaanu. Although it was the period of the rut, he failed to report about sika behavior, or trophy antler potential. His only comment was in relation to the fact that not all sportsmen going after the sika were licensed to do so, some claiming to be employed as camp cooks, but who were armed with a rifle to hunt deer. The areas surveyed by Holmes are located to the east and south of Lake Taupo.

According to Mavis Davidson (1973), contrary to expectations, the sika had dispersed in different directions about the time they had been sighted near Lake Taupo. By that time they had reached the Kaweka Range to the south-east. The Hartree and Whittle families, living in that area, were probably the first people to be aware of the animals in that particular region. A member of the Whittle family was in possession of a set of antlers from a stag killed in 1934 or 1935. R. H. Hartree encountered a sika stag on Turangakumu, a high point on the Ahimanawa Ranges to the east during the 1939 through '45 war years, and a government field officer, Ron Fraser, recorded the shooting of a sika stag in the vicinity of Lake Waikaremoana in 1939, obviously a wanderer. During 1938, Evan Wilson, a South Island-based government hunter, doing one of three stints in the Kaweka Ranges, discovered a small herd of sika on the subsidiary Black Birch Range. He assessed the group as comprising a “very handsome stag” and two male subordinates.

This central North Island herd has, over the hundred-odd years since the initial introduction, established itself over a large range of habitat, incorporating the Kaweka, Kaimanawa, and Ahimanawa Ranges and has, in more recent years, occupied areas beyond this tract of North Island high-country (Fig. 42.1). According to Cam Speedy (personal communication 1998), who has made a study of the sika of

the area and on whom I was obliged to depend while compiling the history of the herd as far as the extent of the range today, the natural dispersal has slowed down quite considerably over the past 20 years.

Nevertheless, expansion due to illegal and unofficial liberations elsewhere continues to see sika springing up well away from their feral range. Evidently, there are something like 14 established populations in various parts of New Zealand today, including at least two in the South Island. In the opinion of the writer, the introduction of this species into the South Island is irresponsible and, as already stated, puts red deer herds at risk, particularly the unique Otago herd, perhaps the sole surviving population of pure indigenous British red deer (*C. e. scoticus*) anywhere in the world!

## Habitat Selection

In the central North Island, the range of the sika is mainly restricted to the central hill country with its poorer volcanic soils and resulting quality of vegetation offered as habitat. Cam Speedy (personal communication 1998) believes, that to the north of the established sika range, on the Kaingaroa Plains, ease of access and excessive hunting pressures in a huge area of exotic pine forest, has reduced the sika's ability to effectively disperse onto new country. According to him game density appears to remain low throughout a good deal of this area and as a consequence, habitat quality is high, thus allowing red deer to remain competitive, despite poor, mineral-deficient soils.

To the north-east, around the area along the highway between the city of Napier and Lake Taupo, the superior forest may also have provided red deer with an environment in which they could effectively compete. In this same region, sika managed to establish themselves where the forest has been previously felled, eventually replaced by scrub. To date, the sika has not advanced significantly to the north-east towards the heavily forested Urewera area, where other species such as rusa (*Cervus timorensis*) and red deer would pose a threat to its co-existence. Competition with red deer as a factor in the spread of sika will be discussed further in a later section.

In 1992, John Mason, of the Pureora Field Centre of the Department of Conservation, informed me by letter that occasional reports of sika having been shot or sighted within the confines of the Pureora Forest Park have filtered into his office since the mid-1970s. It is believed these animals were the result of illegal liberation. Mason stated that it was interesting why they have failed to colonize the Pureora Forest Park to the west of Lake Taupo, because geographically, there is little to prevent them doing so. At the time of writing, there were reasonable numbers residing in the area known as the Tongariro National Park to the south-west, and it is a relatively short distance from there to Pureora.

The northern Ruahine Ranges to the south of the established sika range also appear to present a natural barrier. Cam Speedy believes their lack of ability to displace resident red deer from that area has resulted in minimal dispersal in that direction. According to Speedy, the higher rainfall of the Ruahine Ranges may well present a natural barrier. Consequently, he suspects the key to be possibly climate and soil chemistry.



The limestone outcrops along the highway between the city of Napier and Lake Taupo area, together with the local weather patterns, present red deer with good feeding conditions, thus allowing them to remain competitive with the sika. Although this particular area allows sika to grow superior antlers, for some reason they have failed to make significant progress in dispersal in that direction over the past 20 years or more.

To the east of the original area of liberation, pastoral farming prevents sika from spreading any further in that direction. To the west of the current range lies Lake Taupo and farm development around the lake and the significant township of Taupo. Collectively, they have prevented dispersal in that general direction. South of the lake, however, there exists a different situation. Here sika have established themselves on the western side of the Desert Road, or State Highway No. 1, which passes through that area and have been there for a number of years. They have occupied an exotic pine forest known as Karori and the adjacent native forest of Rangataua on the south-eastern side of Mount Ruapehu, a well-known volcano in the district. They have been in that locality for some considerable time. In more recent years they have moved around the southern slopes of Ruapehu as far as Horopito, some having been sighted on the western side of State Highway 4 in the Eura Forest during 1995. In these areas, because of the domination of the resident red deer, sika are found only in small pockets.

Sika appear to have done very well in the manuka scrub (*Leptospermum scoparium*) country of northern and eastern Tongariro National Park and have been sighted as far west as Mount Hauhungatahi on the western side of Mount Ruapehu, for at least 20 years. They are, nevertheless, rare on the ranges south-west of Turangi, the country lying between Lakes Taupo and Rotoaira, being podocarp and hardwood forest. Cam Speedy records that the *papa* country (a blue soft rock) appears to stop their spread. Here also, red deer competition is strong with ample feed available, thus affording them the opportunity of remaining the dominant species.

In total, sika deer currently occupy some 8,000 km<sup>2</sup> of the central North Island higher country. It is believed this will not change significantly by natural dispersal unless more illegal liberations take place, or red deer competition is lowered by drastic reduction of their population levels, or their elimination by hunting. So, it appears that established red deer populations in their preferred habitat can play a major role in restricting the further dispersal of sika onto new ground and act as an effective controlling element.

## Competition with Red Deer

As has already been established elsewhere in the world, sika can flourish in country where other species of deer fail. In New Zealand their competition with red deer has proved successful, eventually displacing the latter by forcing them to seek more compatible rangeland, in particular the higher altitude country. The sika and wapiti evolved from a common ancestor (Nagata chapter 3), but when the two closely related species have attempted to share common ground it is not always in harmony (Kiddie 1962; Challies 1985).



Perhaps the answer lies in the theory put forward by Cam Speedy that vegetation competition is the most significant factor influencing sika dispersal and establishment in new areas. Sika appear to be more adept at surviving in beech forest (*Nothofagus*), their digestive anatomy allowing them to be more competitive in such an environment than is the case with the red deer. It seems sika lose the advantage in podocarp forest (kahikatea, white pine (*Podocarpus dacrydioides*), totara (*Podocarpus totara*), matai, black pine (*Podocarpus spicatus*), miro (*Podocarpus ferrugineus*)) and hardwood (northern rata (*Metrosideros robusta*)) where the red deer can compete on a more equal footing.

Taking this factor into consideration, it is not surprising that sika have not spread into the Pureora Forest at the anticipated rate. From what I have discovered in regard to “forest” in their native lands, it does not surprise me that such factors here in New Zealand have such an effect on selected habitat. The open forest of northern China, for example, is much more like our open beech forest than is our heavy podocarp forest. As already mentioned, sika in New Zealand are predominantly grazers, depending mainly on the forest for cover over much of the year.

The displacement of red deer by sika in New Zealand is similar to the displacement of wapiti reported by Makovkin (1999) in Primorsky Krai of the Russian Far East. It also fits in with the observation by Kiddie (1962) that the upper range of elevations occupied by sika is limited where red deer are better adapted to high elevation habitats, but in mountains where red deer are absent, sika successfully occupy these habitats. Most authors agree, that in habitats most suited to sika, they outcompete red deer by virtue of their ability to thrive on heavily fed-upon vegetation.

What role behavioral dominance plays in competition between the two species is unknown, but could be relevant. Kiddie (1962) reported on a fight between stags of the two species that was won by the much smaller sika stag. Whereas the red deer successfully “bulldozed” the smaller sika, the latter’s aggressiveness and agility allowed it to parry and thrust against its larger opponent, thus delivering the more telling antler stabs.

Nevertheless, the writer disagrees with this generalization, having witnessed the process both in the wild and in the seclusion of an English park. The rutting seasons of both species overlap, the red deer beginning a little earlier than that of the sika. As a consequence, later in the red deer rut, the stag is tired and reluctant to get involved with the aggressiveness of his smaller counterpart which, by that time is full on. It is the opinion of the writer, that initial hybridization between the two species is initiated by the sika stag mating with a young red deer hind which has missed conception in her early cycles during the red deer rut.

## Hybridization with Red Deer

Perhaps the most controversial subject that arises in relation to the sika in New Zealand is the subject of hybridization with red deer. Unfortunately, a considerable amount of this information is expounded by unqualified observers, and up to this

time, no genetic studies incorporating DNA techniques have been done. Evidence available confirms hybridization certainly occurs (Challies 1985), but not to the levels some commentators would have us believe. Unusual characteristics, such as malformed antler configuration, always attract such opinion, much of which is misleading about causality. One needs to take into account the morphological variability that exists in pure sika. When a first-class sika trophy is taken, the question is inevitably asked if its large size is due to introgression of red deer genes.

In fact, judging on morphological grounds, hybridization tends to be quite rare in the established sikine areas, most convincing reports coming from the regions along the periphery of the accepted range where a greater proportion of red deer exist. This result is consistent with the results of Swanson and Putman (chapter 40) that earlier dispersers in the British Isles are most likely to interbreed. Clear cases of hybridization are usually easily recognized, with several obvious signs apparent in the progeny. Nevertheless, Kiddie (1962) stated that of the 800–1,000 sika he shot over a period of many years, only four animals displayed any evidence of hybridization or, alternatively, created some suspicion. Mavis Davidson (1973) was of the same opinion and supported Kiddie's findings.

Still, it makes sense that the proportion of questionable animals would possibly increase as the years pass by and it should be appreciated that the findings of Kiddie and Davidson were based on observations from 30 to 40 years ago. However, the two species tend to retain their phenotypic identity, and perhaps due to niche separation or assortative mating, as with hybridization in the British Isles (Swanson and Putman chapter 40) they maintain a typical appearance of sika or red deer despite past hybridization, although the sikine characteristics appear to be dominant in most cases. A genetic study using DNA is needed to answer these questions.

## **Adaptation of Sika Phenotypes to Local Conditions**

In describing the visual characteristics of the New Zealand sika, an acute problem immediately arises because of the mixed origin of the herd. Over the many years they have occupied New Zealand, however, some interesting consistent patterns over the distributional range of sika in the central North Island have emerged. It is obvious there are pockets of animals that clearly reflect the different characteristics of either the Chinese, or the Japanese types (phenotypes representative of northern and southern subspecies), or in some instances intermixing of both. For example, to the north and east of the existing range towards the Hawke's Bay side, there is a tendency for the animals to show a predominance of Japanese features, while towards Lake Taupo, or the Kaimanawa Range in the west, Chinese characteristics appear to prevail.

As early as the 1960s, Kiddie (1962) recorded two distinct types of sika occupying the Kaimanawa Ranges, referring to them as two "subspecies" rather than two different phenotypes. Each group was, of course, probably affected by

crossbreeding between the original animals liberated and the interim period since but, nevertheless, notable differences were being observed. Kiddie noted some three inches difference at shoulder height, and I noted variation in coloration and spotting to be different as well. In the Ahimanawa Ranges it was obvious that both size and color of the winter pelage tended towards the Japanese type. In fact, while studying a good number of animals from various sources on deer farms (Banwell 1993), animals could be identified that were distinctly Japanese in character, others resembling those from China's Heilongjiang Province, while others displayed traits of both. It appeared to be more distinct in the males and certainly more so during the winter months when the pelage color was more distinct. Among these animals from varying sources were dark, charcoal-brown and unspotted specimens, while others were a rich, dark chestnut with pronounced spotting and "bibs," or throat patches. Some were intermediate. Within the females there were grayish animals so typical of the Japanese races, while others were of the typical Chinese brownish-grey with quite distinct spotting.

Although the largest of our sika are not as big or heavy as some of the northern Chinese, or Russian specimens, nonetheless, some of the stags taken from the western extremity of the range are much larger than any of the Japanese subspecies with the exception perhaps of the Hokkaido form, *C. n. yesoensis* (Banwell 1996, 1997).

There have been several interesting theories put forward in relation to this significant variation in size within the New Zealand herd. Ernst Eick (personal communication 1996), of the International Sika Society, suggested to me that the significant variations could be due to the fact that the smaller Japanese type was possibly harder to find and offered a much smaller target to the hunter, a factor which could account for them being in larger numbers in certain areas in contrast to the Chinese type with their larger bodies and floral coat.

It would be interesting indeed if this segregation was based on each type preferring a different environment. There is some evidence that this is the case. Davidson (1973) in her long-term study in the area claimed the larger, Chinese type tended to keep to the fringes of the forest more so than the smaller, Japanese-like form which tended to venture into more open areas to feed. This difference would parallel the behavior of the northern and southern types in their native ranges in Asia. Just as in Japan and the Asian mainland, the southern types are adapted to fields and disturbed areas and, being in lowlands, are non-migratory and not winter hardy (Takatsuki 1991). In contrast, the northern types are more adapted to forests, are winter hardy, and show migratory movements in response to snowfall. As previously noted, some New Zealand observers believe that the sika in higher elevations move up and down in response to snow.

The rutting calls of the New Zealand stag, as would be expected, comprise the full spectrum of the sikine group, including the single, descending call as well as the typical Japanese "hee-haw." Some males only emit the single descending call, or moan-like signal, while others produce both styles, reflecting their Japanese influence. The subsidiary calls, such as the "hiss" and the "gurgle" the characteristic of all sikines, are also given by New Zealand animals, and the vocal scope of the female and calf, both in communication and alarm are commonly heard.

An interesting variation in the New Zealand males is the coloration of the antler velvet. Clear evidence of both black (Japanese) and red (Chinese) colors are produced by various stags and, as would be expected, there are intermediate shades. The configuration of the antlers, the variations between the Chinese and Japanese forms, is evident and in almost every case coincides with the color of the velvet, red in the case of the Chinese style, black in the case of those displaying Japanese conformation.

## Health

Wild New Zealand sika, like most of the deer family established in this country, have been relatively free of health problems. Little research has been carried out in this field in New Zealand due to the current "pest" philosophy, most information being left to the initiative of the local hunters to report. In captivity, as part of the deer-farming scene, they are susceptible to malignant catarrhal fever. Endoparasites, including lung worm and nematodes of the abomasums, have been recorded in wild specimens.

Polydactylism (extra hooves erupting above the normal, or multi-hoof components on the regular form) appears to occur more frequently in New Zealand than elsewhere, and is apparent in sika, red deer, sambar (*Cervus unicolor*), and fallow deer (*Dama dama*). In addition to this deformity, campylognathie (twisted nose) has been reported in several specimens of sika and other species. Whether these deformities occur more frequently in New Zealand because of low genetic diversity due to the small number of founders is not known.

## Hunting and Trophy Value

The intrinsic value of the sika herd is very high in regard to the recreation it offers, as well as having a profound effect on the economy of those who depend on income generated by the visiting hunters. The sika is a highly respected quarry amongst the New Zealand hunting fraternity (Fig. 42.2). Trophy potential is world class, some of the antlers secured comparing favorably with the very best taken in their countries of origin and elsewhere, particularly when the proportionate body size is given consideration. Quality has improved considerably since the population density has been reduced by heavier hunting pressure. Some fine specimens have been secured since 1990 (Banwell 1999). Furthermore, the sika has been capable of producing quality antler in areas where the soil chemistry is quite poor, and where red deer antler quality is comparatively poor. This trend is in tandem with the inability of red deer to compete with sika in this area of poor volcanic soils and, as a consequence, inferior sustenance.

Hunting the sika in New Zealand has changed dramatically since the first licenses were issued in 1925. During the early years of trophy hunting, the ethics



**Fig. 42.2** A fine trophy taken by Glenn McRae in the Sparrowhawk Range in 1996.

and etiquette of New Zealand's native Britain were strictly exercised, practiced only by the privileged and wealthy, but in "A Kiwi version of that" as Mavis Davidson (1973) once put it. She recounted that early sportsmen could encounter something in the order of a dozen potential trophy stags in the course of a morning without the need of "squeezing the trigger." Following the removal of protection in 1930, a period of heavy kills took place, provoking a lot of penned criticism and outrage in the sporting journals of the day.

Today hunting sika is free with no license required but, in some areas, a permit from the appropriate authority is necessary; or alternatively, courteous permission requested of the landowner. Hunting is open all the year round. Three completely different hunting factions operate, some chasing the coveted trophy, others hunting merely for the "pot," while the third element simply enjoys the atmosphere of the great outdoors. Helicopters, fixed-wing aircraft, and four-wheel drive vehicles all make access a lot easier than those far off days when "men were men," and long tramps carrying a fortnight's gear on their back was the order of the day. Comfortable huts have replaced tenting in some selected areas. Things are not what they used to be.

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