ESTABLISHMENT OF RED-DEER RANGE IN THE TARARUA MOUNTAINS

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Synopsis
Introduction
Geomorphology and climate
Influences on pattern of deer establishment
Method of liberation
Modification of indigenous vegetation
Physiological and social requirements
Effects of red deer in the Tararuas
Other animals
Deer population dynamics
Discussion
Acknowledgments

SYNOPSIS

In the Tararua mountains red deer followed a normal pattern of rapid development, but territory had to be established before resources could be utilised efficiently. The basic features of deer range were eventually established and population balance is now largely determined by sustained-yield food plants of low quality.

In the Tararuas a new type of forest is evolving through the influence of deer, forest of the pre-European type being rapidly altered although some of its components will remain in existence for centuries. Recognition of the distinctness of these two forests, which belong to different biological eras, is necessary in any comprehensive ecological study, for what may be damage or degradation for the old may be progress for the new.

The evolution of a stable forest of high quality would be advantageous to red deer because in such a habitat they would be well placed to maintain themselves against competition from smaller mammals. Even under optimum conditions, it could not be assumed either that considerable degradation would not occur on parts of the range, or that the general forest would be satisfactory from the viewpoint of national economy, so that deer and the forest require continuous attention. In the Tararua mountains, deer populations have been stable or declining during the last decade, and in future, increase or decrease in the population will depend upon the application of ecology rather than upon the number of deer killed. In a protection forest management should utilise natural trends rather than strive, by unselective hunting, to bring back forests of the past.

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INTRODUCTION

In pre-European New Zealand, forests grew in the absence of browsing mammals and accordingly it is improbable that any of these forests provided an optimum habitat for the introduced deer. This premise is examined in the light of the changes which have occurred both in the vegetation and in the deer herds, but, since the geographical coverage of this paper had to be limited, attention has been focused upon the Tararua mountains.

The red deer population of the region has shown the pattern of development normally followed by animals released in a favourable habitat—a period of rapid increase, followed by stability or slow decline. Little published information is available on the deer themselves, although the story of the plants has been fairly well documented in published papers. Early records of numbers, of body size, and of population structure are missing, and no comprehensive description has ever been published of any red deer herd in New Zealand and several years must pass before basic data are available and analysed. The folklore and sentiment inherited from Europe explain, if they do not excuse, the weak position of research and control in New Zealand, and for the present there can be given only a preliminary historical account of the progression of one deer herd towards stability.

In respect of climate and vegetation, the Tararua mountains agree in essentials with the greater part of the deer country of New Zealand, and they are particularly suited to the requirements of this investigation because the combined observations of the authors extend back nearly thirty years, to a time when much of the forest was unmodified by deer.

GEOMORPHOLOGY AND CLIMATE

In brief, the Tararua mountains lie on latitude 41°S. They are chiefly greywacke modified by earthquake movement, and the geologically young streams fall swiftly, down waterfalls and through gorges, in the narrow-sided valleys. Forest, mainly silver beech at high altitudes, merges into subalpine scrub, which gives way to the native grassland of the "open tops" that rise to just over 5,000 ft. Mist, low cloud, and strong winds or gales are prevalent, and snow may fall on the tops in any month of the year.

The climate is a cold, wet, insular one. High temperatures are seldom reached and are never sustained, even in summer; and in winter sub-freezing temperatures, although they do occur, are not maintained for long. The deer live in persistently cold, wet conditions. Although ambient temperatures may be low, some relief can be obtained, particularly at higher altitudes, in sheltered pockets where insolation can provide some radiant heat even in low cloud.

The annual rainfall is heavy, between 100 and 200 inches, but
in the east the prevailing north-westerlies produce a distinct föhn effect, resulting in drier and warmer conditions.

INFLUENCES ON PATTERN OF DEER ESTABLISHMENT

Method of liberation

In 1862 red deer from English stock were liberated on the Taratahi Plains, Wairarapa, and in subsequent years fawns from this stock were liberated annually at strategic road-end dispersal points along the Tararua foothills. In the early nineteen hundreds young deer were packed into Mitre Flats, northern Tararuas, on horses.

Modification of indigenous vegetation

The lower bush had been partly opened by ingress of domestic stock and further tracking by deer was readily accomplished, particularly in beech forest.

The undergrowth in all types of virgin forest was fairly dense in comparison with forest now commonly regarded as natural. In beech forest the taller ferns were highly vulnerable both to browsing and to the consequent fall in air and ground humidity. In dense-canopied, mixed forests, low light intensity so reduces the rate of growth that plant production is too slow to produce a sustained yield of browse; so that once the undergrowth was browsed it was permanently damaged and no longer impeded the movement of animals. The wider valleys, many with extensive grassed flats, also permitted easy establishment of deer and provided extended lines of communication, although gorges and precipitous passes restricted free movement, especially of hinds.

Despite the slowing of spread by the need for consolidation of territory by marking and tracking, deer, in the main stags, appear to have reached the open tops at a fairly early date. None of the peaks of the Tararua reach as high as 6,000 ft and the limited area of the open country in relation to its length allowed the deer to extend throughout the main ranges very easily. The high tussock grassland was, accordingly, the first zone to be completely occupied by deer.

Early records of deer numbers passed on from deerstalkers are fragmentary and tend to come from isolated areas; it was only when the sport of tramping reached the stage of development where members of clubs were recording “new crossings” of the middle and northern regions of the Tararua mountains that we find any overall picture of deer numbers throughout this tussock-grassland zone. There is a tramper figure of 40 deer on Mount Dundas (Pukemoremore on the 1958 map) for 1923, but for the most part this tramper exploration occurred in the late nineteen twenties and early thirties, and some of the participants’ published observations are recorded in the attached Appendix. Unfortunately, there is no similar record for the southern
part of these mountains, which by this time were comparatively well
known.

The tussock land, however, did not provide a complete deer range
because much of it lay under snow in winter, and in other seasons
frequent gales and storms restricted its use. In years of heavy snow
the tussock lands had some respite from grazing but since the mid
forties there has been a cycle of light-snowfall years with the result
that much of the snowgrass throughout the Tararua tops has been
available to deer in winter. The change in climate, making the
snowgrass available throughout the year, has probably affected the
feeding pattern of the animals.

The high country was occupied early, although initially it was
not readily accessible. Most of it was surrounded by a belt of scrub
(dominated by Olearia colensoi) which even the deer did not pene­
trate easily, and free movement was restricted by the unmarked and
untracked lower forest which in its early condition was mostly repel­
lent to deer. Accordingly, stags which might wander freely over the
occupied tops required to return to known forest territory, and so
range was first developed on and about leading ridges and spurs,
while wide areas of intervening country remained undeveloped for
use by deer.

The low country, under 2,000 ft, was used extensively because
they were liberated there, under protection, but this life zone is a
more natural habitat for fallow or roe deer than for red, and with
the depletion, or sometimes virtual extermination, of the preferred
food species, deer numbers fell. The removal of protection from
deer in 1930 probably accelerated rather than caused the reduction
of deer numbers on peripheral low country (by direct disturbance
and restriction of supplementary farmland grazing), for some reduc­
tion was inevitable since red deer would give precedence to the occu­
pation of country which more nearly approximated their natural life
zone.

Deer use of the valley floors was also reduced, partly by disturb­
ance, and partly by depletion of foods. Several factors appear to
have affected the original grassed river flats. The early introduction
of clover (Trifolium repens), probably by the deer and wild cattle,
added a highly nutritive browse-resistant species; but the silty soil
did not maintain fertility under heavy grazing by deer and rabbits
(the cattle were shot out) and today flats hold little clover or grass
of high nutritive value. Many valley bottoms were intrinsically un­
suited to deer, because they received little sunshine and they held
cold, damp air, which the animals, by keeping to the higher slopes,
avoided.

Physiological and social requirements of red deer

In the classic pattern of range occupation (Darling 1952, 1956 a; de
Nahlik 1959), apart from the period of the rut, mature red deer
are segregated, the hinds, together with the young of both sexes up to two years, occupying relatively warm and sheltered areas, and the stags being found on colder and more rugged areas where a greater quantity of food can be obtained. Two months before the rut the herds of stags split up, usually into pairs comprising an old stag and a young one, the old stag feeding and resting while the young one acts as sentry. Then, just before the mating season the stags join the hinds on hind territory, where the rut takes place. According to de Nahlik, the rut of deer in Europe, accompanied by “roaring”, starts between 15 Sep. and 1 Oct., depending on the locality, and lasts two to four weeks. He also mentions the possibility of a belated, minor rut — as late as Jan. — and, with the onset of winter so close, the possibility of the animals concerned failing to survive. Such an occurrence would result in roaring of red stags outside the usual rutting season. In addition to movement in connection with the physiological and social requirements of red deer, there may be a seasonal one, i.e. a general movement on to lower country for the winter.

Distribution of deer in the Tararuas differs from that just described in that it is much more variable, largely because of climate. Initially, as would be expected, stags extended territory by breaking into untracked forest, and this led to some areas containing only stags while establishment was in its early stages, but hinds and juveniles followed soon after. The frequent cold gales with heavy rain prevent permanent occupation of the tussock grassland, and they necessitate a considerable amount of movement, with territory determined by shelter and aspect rather than by altitude. In effect, the life zones which can be distinguished by vegetation and by altitude are subordinated for deer by microclimates, which form mosaics rather than the normal horizontal bands.

The physiological requirements of stags and hinds in the Tararuas are the same as elsewhere, but in meeting these needs the animals do not become clearly segregated, according to sex, in accordance with the standard pattern (Darling 1956a and de Nahlik 1959), and because of the changeable climate of the Tararuas, of the possibility of bitter, gale-force winds and snowfall occurring in any month of the year, differentiation between summer and winter territory is not marked.

In 1939, H. P. Barra, who was in charge of government deer shooting in the Tararua mountains, considered that the majority of deer spent at least six months in the bush and that a good many of them never left it at all. In the early spring some of the breeding hinds moved out on to the tops for a few weeks, returning to the bush as parturition approached and remaining there until their offspring were strong enough to follow them if disturbed. Juveniles of both sexes, which also started to go out on the tops in the early spring, remained there till the autumn. He was in some doubt regarding the movements of the older stags.

In the Tararuas the rutting season appears to be less sharply defined than is considered normal, and so it is not unusual to hear red
stags roaring “out of season”. Under adverse weather conditions only a few stags emerge on to the open tops during the roar, the majority roaring in the shelter of the bush. In sparsely populated bush areas, stags may not roar at all.

**EFFECTS OF RED DEER IN THE TARARUAS**

The vegetation of the Tararua mountains has been described periodically, as indicated in the references hereto, since 1907. Holloway *et al* (1959), in their report on the forest and range survey of the Tararuas, have reviewed earlier published and unpublished work covering climate, geology, and vegetation, and make an original contribution in ecology. They give the latest picture. The present paper does not attempt to cover the same ground, but adds supplementary notes from the viewpoint of animal ecologists.

The high-level tussock grassland had been modified before either author made its acquaintance, but much of the forest was still untracked and untouched. In the late twenties, trampers complained of muddied drinking water in tarns caused by trampling of deer. S. G. McIntosh (1929), referring to the Cattle Ridge, near Mount Bannister (5,080 ft) in the northern Tararuas, had this to say: “This ridge is very flat, favourable to the formation of tarns, and much frequented by deer, well-worn tracks running in all directions. Traffic to the numerous tarns had been so considerable as to foul the water beyond human use. This, however, is not the only set-off to the merits of deer as track-makers. The meadow zone of this locality, as well as other areas visited, shows evidence of much browsing, even the sword-pointed Wild Spaniard coming in for a considerable measure of attention. Immediately below the bush line in places there are small areas that appear to have been practically cleared by deer.”

Later, wallowing and trampling caused a number of tarns to disappear, as described for Bull Mound by Zotov (1947), but the remaining (modified) tarns of today tend to remain clearer. Originally, these small bodies of water were bordered by semi-aquatic plants growing in soft mud but these were destroyed by continual churning and the soil was carried away in suspension during heavy rain. Disappearance of a tarn resulted either from the breaking of the water-impervious bottom layer, or from loss of the lower retaining wall. The strong winds of the area caused an appreciable lap of water against the banks, and borders are now either stony or composed of trampling resistant *Oreobolus-Carpha* turf. An interesting development of this induced turf is seen on Cone (3,547 ft), where only bare stones remain, marking the position of the former tarn, and its encircling bog. A. P. Druce (1950) envisages such a condition occurring on the summit of Kapakapanui (3,615 ft) on the south-western Tararuas, for he writes: “The bog is beginning to erode away at the lower end and, as has happened already on parts of Bull Mound, it may well
disappear in a few decades leaving only the characteristically leached underlying rock to tell of its former existence.” On Cone, however, an enlarging string of water pockets has appeared in the *Oreobolus* immediately higher up the slope, and these may form a new permanent tarn. Although to some extent the present condition of tarns may be a reflection of reduced use of the grassland by deer because of a greater exploitation of adjacent forest, it is at least in part due to change in deer use following the loss of peaty mud which was attractive for trampling and wallowing in.

The effect of deer on tussock varies to some extent with the situation. Wind-exposed areas or points were always stony and have not been greatly modified, but prominent knobs which were sufficiently sheltered to grow tussock have mostly been reduced to bare rock; elsewhere the final result largely depends upon soil condition. Poorly drained soil tends to go to *Oreobolus*-*Carpha* turf, with an admixture of *Danthonia colensoi*, especially if exposed to wind. In damp but well drained areas, *Danthonia flavescens* is likely to increase relatively to minor species, while on drier slopes the snow-grass tends to give way to *Celmisia* and to the small unpalatable plants which spread over bared soil.

Of the two forms of *Danthonia flavescens* present, the broader-leaved one is preferred as food and so tends to give way to the less palatable variety, but deer, when they rest and chew the cud, take either form within reach quite indiscriminately. Repeated use of the one spot eventually produces a small denuded pocket associated with a shelf formed in the slope by trampling. These lying-up areas form amenities of deer range, but on steep slopes they can develop into land slips.

Of species other than grasses, both *Aciphylla colensoi* and *Anisotome aromatic* are subject to destruction. In our experience, however, *Aciphylla* has recently increased, but *Anisotome*, except in a dwarfed form, is now restricted to inaccessible places. F. Penn (1920), writing of Alpha above the bush line, records: “Here is another alpine meadow and flowers bloom most profusely—indeed all along from here to Table Top are hidden alpine meadows . . .” and again, along the Dress Circle, “The edelweiss here grows profusely, and for a while one is tempted to step carefully so as to avoid trampling upon the blooms”. Today there is no danger of such an occurrence—the occasional cluster of flowers tends to be an object of wonder. Other plants of the tussock land—*Hebe astoni*, *H. buxifolia*, *Senecio bidwillii*, *Nothopanax* spp., *Astele cockaynei*, and also *Olearia colensoi*—have been reduced although much of the last species still remains. *Dracophyllum rosmarinifolium* is likewise reduced, but the other Tararua species, *D. urvilleanum*, has been little affected.

In general, there has been an increase of tussock relative to minor
species and scrub in the grassland area, but throughout the area the tussock shows a reduction in density and growth.

The scrub which lies above the bush line in the Tararuas varies considerably. It flourishes in wet, foggy conditions, particularly in the absence of high-altitude beech, so that a well developed zone is usually found along the western side of the range and in the northern Tararuas. On Alpha (4,467 ft) on the east, however, there is no defined zone, and scrub penetrates the grassland in places but for the most part is interspersed throughout the stunted trees of the upper silver beech zone.

In the upper scrub belt, great reduction has taken place and *Olearia colensoi*, which remains, is well tracked. In the scrub under the silver beech, *Senecio elaeagnifolius* has suffered heavily, being completely eliminated in many places. *Olearia colensoi*, the most important species in the scrub zone, is not a preferred deer food but it is eaten, and the tall, straggling form is easily killed by persistent browsing. The compact cushion form is more resistant to browsing but seedlings are vulnerable. It is probable that the young plants of all Compositae species were eliminated, but older individuals of *Olearia lacunosa* not merely survived but were favoured by the new conditions and increased in size.

Of *Nothopanax* species which were abundant in the high-level bush, only some *N. sinclairii* remains. The loss of *N. colensoi* was particularly noticeable during the thirties; deer ate the bark, and the white, stripped trunks became a conspicuous feature of the forest, remembered by many trampers. G. B. Wilson, a delegate to the Wildlife Council in Nov. 1932, records that “along the top of the Marchant Ridge the ‘fivefinger’ trees have been stripped clean of bark”. Zotov (1947) reports similar stripping of *Griselinia*, but this does not occur now—in fact *Griselinia* is fairly common.

Modification of the vegetation has resulted in a changed deer-feeding pattern, and after the reduction of palatable species light browsing has become usual. Because of this a deer which formerly could have satisfied its needs locally is now obliged to travel some miles to obtain its daily quota.

Sometimes, regeneration on formerly heavily used tracks is erroneously regarded as indicating reduction of deer in the area. In the late twenties trampers cut a track up Gable End Ridge from the Ohau River and over Richards Knob to Twin Peak and Waiopehu; from Richards Knob the Dora Track was cut across Butcher Saddle and up to the grassland on Dora (4,805 ft) (now renamed Pukematawai). In the thirties and early forties deer used these tracks. Richards Knob was notorious for mud and from Te Matawai hut at the bush line a muddy track from 4 ft to 6 ft wide in places extended up the mountain. In recent years the scrub on Richards Knob has become open and the area has lost its former reputation for muddiness, and
in early 1959 snowgrass met across much of the Dora Track above the bush line; it was obvious that the cut tracks had ceased to be used to any extent by deer. Adjacent scrub in the Otaki and Manga­haao Valleys which had been virtually impenetrable earlier is now completely occupied (even invaded by goats to the head of the Otaki) and there is no inducement for deer to use the old highway. This reduction of use which follows the opening up of forest applies equally to deer tracks or to man-made ones, and has been commented on before (Kean, 1951).

OTHER ANIMALS

Cattle, goats, hares, rabbits, opossums, and pigs affect, or have affected the establishment of deer. Goats in particular present intrinsic, serious problems, but none of these animal species at present fundamentally alters the basic principles of deer ecology, and they are not considered here.

Similarly, the birds, together with their predators, and the rodents, are important to forests and to deer in the distribution of seed, and in other ways, but they too must be excluded from this study.

DEER POPULATION DYNAMICS

The initial build-up of red deer in the Tararuas passed almost unnoticed and unrecorded. (See attached appendix.)

Penn (1920) described a typical trip across the Tararuas, now known as "the southern crossing", refers to deer on the flats of the Tauherenikau Valley: "... there we can see several fine does feeding quietly ... an unsuspected stag, with a magnificent-looking head, comes into view, slowly feeding". On the way up Bull Mound from the Tauherenikau River they "note the signs of deer, cattle and pigs, to which our leader frequently calls attention. ... Arriving at Bull Mound we visited our first tarn ...", a sight denied the present-day trampler.

A press report of 14 June 1928 referring to a meeting of the Wellington Acclimatisation Society the previous night, states that the society had no statistics regarding the natural increase of deer liberated by them in the Tararuas. "On the Tararua Range the herds were well in hand. The only part requiring attention was the upper Tauherenikau, where a little culling was required. The herd at Ohau was not too numerous, and there were less deer at Shannon, Mangahao, and Teritea than there has been for some years." The theme for the Wellington district was that deer numbers were declining. In the same year Norman Elder (1959) saw a mob of 100 deer on Totara Flats.

As mentioned under "Modification of Indigenous Vegetation", towards the end of the nineteen twenties trampers became active in traversing these mountains by various routes known as "new cross-
ings” and, among other things, noted deer numbers seen. Their observations, however, referred virtually only to the “tops” and river flats, leaving few records of the development of deer tracking and territory marking throughout the forest itself.

Between 1929 and 1934 trampers recorded sightings of deer in one day of up to between 200 and 300 animals. In Jan 1935, and throughout the ensuing autumn, Government shooters operated in the Tararuas, killing 1,011 deer; but from 1936 onwards trampers in the “northerns” considered the animals were becoming increasingly numerous in that region and would constitute a menace. At the end of 1938, 40 deer were seen in a few hours between Mitre Peak and the Waingawa River-Arete Stream confluence, and the following Easter a party in the Waiohine headwaters found that “the number of deer was amazing and stags seem to appear from everywhere”.

From his observations during the 1938–39 campaign, the Government field officer for the area (H. P. Barra) reported that deer had “made a rapid increase since 1935, especially in Mangahao, Ruamahanga, Waingawa, Waiohine, Tauherenikau, Hutt and Otaki”. He considered that damage was equal to anything he had encountered elsewhere, and that it was more evident in the bush than the open country, the deer being a “more bush-living animal”. He cites serious damage (since the 1935 operations) to the bush in the headwaters of the Hector, Waiohine, Mangahao and Ruamahanga Rivers, and on the northwest of the Hutt and Tauherenikau Rivers.

In the 1938-39 Internal Affairs departmental report the appointment of a permanent shooter for the Tararuas (as in the Urewera-Waikaremoana area) was announced, and for the year 1 Jun 1938 to 31 May 1939, 2,538 deer were killed, 111 in 1939-40 and 1,213 in 1940–41. In Feb 1941 Barra reported: “The only place where I found deer to have increased since our last visit is from Penn Creek to the headwaters of the Otaki, and the headwaters of the Ohau and Waiohine. Deer have made quite a number of fresh tracks into the headwaters of the Hector River and, also appear to be working down Penn Creek”. In Apr 1941, R. I. Kean reported on the Ohau catchment to the effect that the modification of the vegetation and the presence of an unusually large proportion of stags tended to support the view that deer had increased in that area only recently.

A tramper complained of poor heads in the Waitewaewae in 1940, but in general for the early forties there is a lack of significant records from trampers, which may mean that no records were taken (when so many young men were overseas), or that the deer were off the tops because of now adequate tracking of the forest below, or because of general wariness of animals subjected to a policy of “open slather”. During the 1941–42 financial year 724 deer were shot, but no Government shooters operated between 1 June 1942
and 31 May (probably Oct) 1944; by this time reports of 50-odd deer being seen in a day again were being recorded.

A newspaper (Auckland Star 18 Jan 1944) reported the experience of a party tramping from Masterton to Levin as “at no time while above the bush line were they out of sight or sound of deer. . . . The animals were frequently encountered in herds of six and seven . . .” The only region the deer seemed reluctant to open up was the dense shrub lands of the western side of the northern Tararua.

For the financial years 1944–45, 1945–46, 1946–47, and 1947–48, Government tallies were 202, 392, 924, and 946 respectively.

The Department of Internal Affairs field officer, R. Lawrence, reporting after the 1948–49 season, when 1,220 deer were shot, considered that “There is a very definite drift of deer to the eastern side of the range with the heaviest concentration about the Wainaga River headwaters. In the lower Mangahao River area deer are very scarce and not in sufficient numbers to warrant further operations in the immediate future. Deer did not appear on the tops in any large numbers until early May, and from then until the end of the season concluded, the highest tallies were secured. Stags remained in the bush during the roar. . . . The season was one of prolific growth and regeneration very marked . . . a very noticeable fact was the immense increase of young trees, mainly pepperwoods . . .”, an unpalatable species. Lawrence concluded, “. . . my considered opinion is that deer on the Tararuas are at least 50 per cent less than they were during the 1935–40 period [because of commercial shooting in a period of very high skin prices]. Some areas are almost free from deer, but no doubt with regeneration taking place they will drift back to these areas”.

Tramper records for the forties and fifties show continued tracking of the forest. In 1949 a party followed a newly cut route from Te Matawai hut across one of the headwaters of the Otaki to the main range near Butcher's Knob; in 1959 one of the same party found there was now no need for a cut route as the bush and scrub were quite open – and invaded by goats. Elder (1955), visiting the Tararua after 20 years, remarks, “It was a jolt to see how the Tararuas have altered. All along the main range, across the Waiohine, the bush was no longer a dark green carpet but moth eaten and tattered, with scrub and tussock showing pale in the gaps.” The tally of deer seen for the trip from Holdsworth to Bannister was about 150.

In 1959 the Tararua Forest Park ranger (A. Geddes), who had made an extensive survey throughout the Tararuas during the summer, accompanying officers of the NZFS Forest and Range Experiment Station on their botanical survey of the Tararuas, reported a high population of deer over a large rectangle running south from Ruapai to Dracophyllum Knob (3,555 ft) on the main divide, thence SE to
Adkin on the Holdsworth-Mitre range, down through the bush to about the Baldy Creek - South Mitre Stream confluence, N and NE to the Herepai-Alma ridge, and back to Ruapai. From Dracophyllum Knob southwards to near Vosseler (3,980 ft) he shows the high-altitude grassland as infested with deer, and populations throughout the high-altitude forest of the various catchments.

Sight records of deer are not reliable on their own and even destruction of vegetation can be misleading if applied to the estimation of deer numbers. In the forties, large areas were virtually denuded as high as the browse line, but such places, although they produced little, were still frequented by deer, which maintained browsing pressure although they obtained most of their food elsewhere. Barra records that deer, in quite large numbers, use warm, low-lying, eaten-out country during winter, especially on spurs lying to the sun. Newcombe and Kean (1936) note that “…numerous deer or other animals are required to clean out the undergrowth but once it is depleted very few are sufficient to prevent regeneration”.

In the fifties, there was some recovery of plants in the denuded areas, and also a reduction in the incidence of new land slips, but these changes, while they were brought about by reduced deer use (and by spread of unpalatable species), were not attributable to a fall in total deer population; all they showed was that the opening of new territory was proceeding relatively faster than the increase of deer.

A definite peak in vegetation damage occurred in the forties, but this did not prove that there was a corresponding peak in the deer population, or even that deer numbers had reached a maximum. Deer increased rapidly at least until the mid thirties, and then their numbers became relatively stable.

It has been stated that deer populations in New Zealand protection forest build up to a peak and then decline (Riney et al., 1959), but this belief is based upon analogy with the classic deer “irruption” described by Leopold et al. (1947, 1950). The “irruption” is a peculiarly American phenomenon which is attributable to the artificial overstocking of deer range, usually on semi-arid land, with additional use by domestic stock, resulting in permanent reduction of carrying capacity. An initial high peak of population follows the elimination of predators and the prohibition of hunting except for a short open season for bucks.

The Tararuas (and other similar areas in New Zealand), differ in that they were never established deer range, and that protection of deer was removed while the herd was still growing rapidly. The forests contained a large bulk of browse-vulnerable food, but only a fraction of this could be utilised at any one time because of lack of territorial development. As the browse-vulnerable vegetation was used up, browse-tolerant growth forms began to appear in the
cleared spaces. The evolving deer range held progressively less food but its new resources were increasing and would be permanent if not over-utilised, while newly formed tracks greatly increased the distances which could be covered — the new foods were of low quality, but they were readily available. If all the food supplies had initially been available to deer the population would have built up to a definite maximum and then fallen suddenly to a low level, but in practice the exploitation of vulnerable food plants was a gradual process and it is not yet complete.

Although reliable data on deer population structure cannot be obtained from normal sight records or from shooters' tallies (unless an extremely high proportion of the herd is killed), such information, which would be important if increased production of deer were required, is not entirely necessary when reduction is the aim, provided the principle of compensatory adjustment of mortality is accepted. Briefly, climate, food, social factors, and hunting are maintaining a near balance of population, and moderate increase in the effectiveness of any one lethal factor under the present system of range use by deer is likely to be offset, over a sufficiently long period, by a nearly equal relaxation of other lethal factors. The principle which has applied is that of density-dependent control of population (Kean 1960) — under present conditions. In effect, organised killing of deer would constitute an additional limiting factor, but it would require to nearly equal in its effects for any given period, the sum of the previous losses in an equal period before actual reduction in the population occurred.

Near stability in the deer herd, however, does not entail that there should be a corresponding stability of soil; deer population dynamics, forest evolution, and erosion, although associated, move according to different time scales.

In much of the silver beech forest regeneration is sufficient to maintain an adequate canopy, but browsed beech grows slowly and there is some doubt whether the replacement of old trees will be sufficiently rapid to prevent soil erosion. The form of young silver beeches depends upon light intensity, exposure to wind, and browsing pressure.

In dim light under an unbroken canopy regeneration is likely to be absent, and in extreme cases soil may be completely bare. With brighter light, seedlings develop a thin, spindly habit which survives the low intensity of browsing usually found in such a site. Under bright light small seedlings have a very high rate of loss, but those that survive for several years adopt a compact, hedged form that is strongly resistant to browsing. Such young beeches increase steadily in diameter and height, and growth rate increases with size. Ultimately, reserves are sufficient to permit the development of a tall central stem. Under given conditions of soil fertility and light, the time of
development to tree form will depend upon browsing pressure, but in normal forest deer will not prevent such growth.

The change from cushion to tree form does not indicate variation in deer numbers but simply that many factors have permitted tree development to reach the transitional stage within a forest; silver beech does not have a high food-preference rating, but the situation changes where silver beech trees grow in isolation from others of their species, or on forest margins.

In the lower forests, as in the higher, the feeding habits of deer have changed fundamentally. The basic foods of the early days are gone, and their place is taken by grasses, the large *Microlaena avenacea*, smaller species such as *Danthonia pilosa* or *Poa brevifilum*, and sedges such as *Uncinia* and *Carex*. Regeneration supplies scanty browse, but bole shoots from kamahi, mahoe, and broadleaf (*Griselinia*), together with fallen leaves, are a more important source of food.

Despite a semblance of overall stability of the Tararua deer herds, there have been many local changes in population density.

**DISCUSSION**

The indigenous vegetation of the Tararua was not adapted, either in botanical composition or in structure, to browsing, and after the establishment of deer, it was inevitable that much of it would be swept away. In some instances recovery or persistence of the original forest is proving sufficient for protection purposes; in others degradation is proceeding and may be irreversible.

After the first liberation of deer in the Tararuas fifty years passed with evidence of only moderate deer numbers, and with little noticeable damage to vegetation, but as the rate of utilisation by deer overtook plant growth, forest depletion became marked very suddenly. The situation was a complex one which has been commonly oversimplified. In general, one school of thought dwells upon the damage caused by deer, and a conflicting school adopts the negative attitude of denying any damage. Both schools fail to give adequate coverage to the whole field.

It is unquestionable both that soil erosion has been accelerated by deer, and that there is a great potential threat of serious economic consequences; but soil erosion is considered here only in its relationship to the establishment of deer range.

In the past, slipping in relation to drainage systems and to tectonic movements has been the dominant geomorphological factor. Sheet erosion, except upon new or active slip faces, is a recent development. Slipping was common before deer attained large numbers, and must be regarded as a natural attribute of the area. There is some evidence (G. L. Adkin, per com.) that erosion is intermittent and that periods of slip initiation are followed by periods of slip stabilisation. It is unquestionable that slips have increased since deer reached large
numbers, and as a direct consequence of their activities, but it is not known whether this development has occurred during a slip-stabilising period or during a slip initiating period, when some of the increase would not be attributable wholly to deer.

The relationship of deer to territory is, however, very complex. In general, any mammalian species of the Holarctic Zoological Region which has continued its existence to the present day must have been better adapted for a certain habitat (or more precisely biochore) than any other competing mammal. Further, any species faced with extra-specific competition must have avoided degradation of its habitat if it escaped extinction (Koskimies 1955; Kean, in press); and from this postulate can be deduced that a species which improved its habitat would have a selective advantage over a species which exerted no positive influence and simply refrained from damage. Further, improvement should be mutual, with compensating adjustments occurring in both animal and habitat, so that the stability of both would be enhanced, and the mutual adaptation of established animals and plants would reduce the likelihood of invasion by foreign animals and plants.

The actions and reactions of species and habitat need not be direct or simple ones. Serial phases could be established (or occur through exogenous fluctuations, as of climate) but such complications, which would not be unexpected, for example, among the prolific Rodentia, would be improbable with animals such as red deer, which are adapted for stability through their relative longevity and low reproductive rate.

In the Tararuas a new forest is evolving through the influence of deer, and forest of the pre-European type is being rapidly displaced, although some of its components will remain in existence for centuries. Recognition of the distinctness of these two forests, which belong to different biological eras, is necessary in any comprehensive ecological study, for what may be damage or degradation for the old may be progress for the new.

The evolution of a stable forest would be advantageous to red deer because in such a habitat they would be well placed to maintain themselves against competition from smaller mammals (Kean, 1959). Even under optimum conditions, however, it could not be assumed either that considerable degradation would not occur on parts of the range or that the forest would be satisfactory from the viewpoint of national economy.

Winter deaths of deer appear to be common in New Zealand, and it is not sure that natural predators (see review, Errington, 1946) would lower the present level of deer in the Tararuas. Such predators would serve their most useful function in keeping the deer moving (Darling, 1956b) and in this way would reduce the pressure of browsing and trampling.
Comparisons of similar areas in the Tararuas suggest that deer numbers in any class of country are inversely proportional to disturbance within it by shooters and trampers. It also appears that deer are most readily displaced, by any form of disturbance, from the low country which appears to lie below their natural life zone.

Deer losses appear to be density dependent; so increased density in preferred areas because of emigration from disturbed ones would reduce population through increased hunting success or through winter deaths.

The low country of the Tararuas is important because in the aggregate it is of large area. Deer on it have fallen in numbers, and this fall, representing actual deer and potential reproduction, has a considerable bearing upon deer numbers of the mountains as a whole. It appears that, after depletion of preferred foods, deer have moved up to the higher country, which is intrinsically more attractive to the species, and that disturbance may have been a contributory factor. It cannot be assumed, however, that this situation will remain. The lower forests are changing, and a return to higher population densities would probably result from a natural sequence of developments.

The killing of deer after forest has deteriorated does not constitute control; trends of deer herds need to be anticipated.

In the Tararua mountains, as in any protection forest which holds deer, management requires to be based upon ecology, and should utilise natural trends rather than strive, by unselective hunting, to bring back forests of the past.

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APPENDIX

ANON, 1928. RED DEER THINNING-OUT PROCESS IN WELLINGTON DISTRICT; Account of Wgtn. Acc. Soc. meeting, Dominion, 14 June 1928.

McINTOSH, S. G., 1929. A SUMMER TRAMP, EKETAHUNA TO KAITOKE. Tararua Tramper 1, No. 6, and Evening Post, 11 Feb. 1930.

Party saw over 70 (in mobs up to 20) in one day in February between Ruapai (4,195 ft) and Dundas, and the Tarn Ridge. In the Press, comment is as follows: "This was within a few hours. Moreover, it was not the time of day [very hot] at which deer are most numerous above the bush line, and we were not specially engaged in taking a deer census. A further indication of the prevalence of deer in the district referred to is furnished by the state of the tarns which here and there dot the meadow land. For several miles not one of these tarns has escaped fouling by deer. The approaches to the tarns in some instances have been converted into veritable quagmires, so much have they been used. This state of affairs is not confined to the district mentioned; it is equally apparent in other little-frequented parts of the Tararuas."

Another party in 1929 (Dominion, Jul 1933) observed 100 deer in a day between Ruapai and Lancaster (4,830 ft), and in the same year 50 were sighted in the Tauherenikau Valley.


Descending from the old Mountain House on Holdsworth to Totara Creek, the party found that "the bush is open, and there is a good
deer track on the long, low ridge, which takes one... to the junction
of the stream with the Waiohine River.” From Sayers’ whare on
Totara Flats, some time was spent in “exploring the surrounding coun-
try and in beholding occasional groups of browsing deer and cattle.”

McINTOSH, S. G., 1930. TEN DAYS IN THE WAINGAWA VALLEY.
Tararua Tramper 2, No. 4.

At the end of Nov. 1929, McIntosh in describing the first ascent of
Bannister (5,080 ft) from the Waingawa River–Cow Creek confluence
does not give actual numbers but indicates that tracking of at least
leading spurs was well under way. “This spur [from the confluence],
steep in its lowest stages, proved very direct and short, with a rough
der track, which, by means of slasher and axe, was converted into a
good blazed walking track.” Again, “Well worn tracks and closely-
clipped grass betrayed the prevalence of deer and pigs, numbers of
which were sighted.”

Setting off to climb Bannister they wondered if a detour would be
necessary to negotiate a cleft before the peak but “an encouraging sign
was the presence of some sort of deer track; where deer had been
men also could go. Did the track go full way to Bannister? Time
showed that it did.” [Deer apparently made a short detour on the
Ruamahanga side.]

ANON., 1933. DEER IN THE TARARUAS. Dominion, 6 Jul 1933.

In the upper Waingawa basin 70 deer were counted in one day
in 1931.

NEILL, W., 1931. EKETAHUNA TO MASTERTON. Tararua Tramper 3,
No. 3.

A small party travelling via Putara, Ruapai, and Arete (4,935 ft),
sighted 20-odd deer near the Arete tarns, bringing the number to over
50 for the day.

McINTOSH, S. G., 1931. A NEW RIVER TRAMP. Tararua Tramper 3,
No. 4.

Speaking of the Ruamahanga below the forks, “The game tracks on
the flats were well worn, with many fresh imprints, deer and pigs
appearing to be more numerous than in the Waingawa.” Of the usual
route cutting out the horseshoe bend in the Mangatainoka River: “There
is a good deer track leading to the top of the ridge. . . .”

NEILL, W. 1931. NEW TARARUA CROSSING, SHANNON TO MAS-
TERTON. Tararua Tramper, 3, No. 6.

Neill records a well worn game track on the lower portion of a
spur off Island Ridge in the Mangahao area and “a fairly good deeer
track” through the scrub on the Haukura ridge from East Peak (4,400
ft) down to the Ruapai-Ruamahanga confluence.

ANDERSON, H., and NEILL, W., 1932. LEVIN – DORSET RIDGE –
MAS TERTON. Tararua Tramper 4, No. 4.

These trampers wrote of climbing up from the foot of the Dorset
Ridge through dense bush “mitigated to some extent by deer tracks”.
On the ridge above the bush line “deer tracks were in great abundance
but surprisingly few deer were seen throughout the whole trip”.

ANDERSON, H., 1933. DEER IN TARARUAS. Dominion, 6 Jul 1933.

This tramper estimated that between North King (5,100 ft) and Puke-
matawai (4,805 ft) some 200 deer were seen in a day in Mar 1932,
the largest mob, located in the Girdlestone arm of the Waingawa basin, being 30; an independent observation for the same year gives a mob of 33 on Lancaster. A valley observation for 1932 was 50 deer on Totara Flats.


Early 1932 saw the completion of the new track from the Tauherenikau Valley to Hector (5,016 ft) by way of Cone (3,547 ft); and Wilson, reporting on this venture, provides a footnote regarding deer. “No signs of deer are evident around Neill (3,780 ft), but just before reaching the bush line on the ridge to Hector, deer tracks suddenly appear. These come from high up the river valleys. Deer seem fairly plentiful on the grass ridge above the bush line, and on the recent weekend trip about a dozen including several stags were seen at about 10 o’clock in the morning.”

READ, C. J., 1932. HOLDSWORTH-LEVIN. Tararua Tramper 4, No. 9.

At Easter 1932, trampers crossing the ranges had a good view from Lancaster into the Park Valley and noted a deer stalkers’ camp in the upper reaches.

GALLETTY, A. E., 1933. OTAKI-EKETAHUNA, ANNIVERSARY DAY. Tararua Tramper 5, No. 6.

In January 1933, trampers complained of a combination of leatherwood, stunted birch, and turpentine between Kelliher (3,830 ft) and Puketoro (3,730 ft) but next day they note: ’That afternoon the tramp lay over a broad deer-worn highway over Dundas, Logan, Pukemoremore, East Peak, and on to Ruapai.’

“OBSERVER”, 1933. DEER DENSITY; STATE OF TARARUAS. Evening Post, 28 Apr 1933.

A Press statement suggested it was desirable to distinguish between forested areas and meadow land when considering the density of deer. This correspondent considered that there were signs of damage on the river flats the responsibility for which must be shared by cattle and pigs, but that there was little evidence of damage on the forested slopes and that natural regeneration would restore any damage there. Above the bush line, however, practically the whole of the blame could be put on the deer; in some cases access to the tops had been facilitated by man-made tracks. Deer fouled the alpine tarns and browsed the vegetation, leading to erosion; he concluded that damage above the bush line was in general irremediable. “A noticeable feature of the Tararua deer question,” said this writer, “is the change that has occurred during, say, the last five years in the visible evidence of their presence and... apropos of the value of visible evidence on the deer question... about four years ago a party which did this trip and the return journey twice in three weeks saw from six to twenty deer on each of the four days concerned; yet another party which between the two trips visited the area for some days for the purpose of investigating the deer question reported little signs of any deer.” Whether through trapper disturbance or the “open slather” policy deer were less numerous in the bush and the position had apparently improved on the tops also.

“...A few years ago it was the rule rather than the exception, to see one or more herds of from 30 to 50 in the course of a trip over
the northern or central Tararuas, but such a herd has not been reported for a long time, and nowadays deer are met with along the top fairly frequently, but only in small parties of from two to five." He concluded by saying that "It is, of course, impossible to say whether in the Tararuas as a whole deer have actually increased [sic] or whether they have merely retired into the forested parts less frequented by man. Visibility in the bush is so limited, and the movement of deer so facile that the only means of forming an unbiased opinion in regard to the forested area is by carefully noting damage (and recovery) over a series of years. . . ."

ANDERSON, 1933. DEER IN THE TARARUAS. Dominion, 6 Jul 1933.
Records 100 deer counted in the Ruamahanga basin under date 1933, and 40 seen between Arete and Mitre (5,154 ft).

VOSSELER, F., 1933. TARARUA FORESTS. Evening Post, 10 May 1933.
Mr. F. Vosseler, President of the Federated Mountain Clubs, was reported on 10.5.33 as saying that he had been in the range with a party of 20 people and they must have seen between 200 and 300 deer in one day.

Wilson reported that on Quoin (3,905 ft) "two acres of the tussock covering have been entirely removed and the hilltop has been converted into a stockyard". Deer tracks were very marked (also a few cattle traces) and eight stags were counted at this spot. Down in the bush numerous dead five-finger (Nothopanax) were seen and some living ones in the process of being killed by the removal of their bark by deer, with whom this tree is a favourite. . . ."

"NEW ZEALANDER", 1933 ANIMAL DAMAGE; DEER ON THE MARCHANT. Evening Post, 23 Nov 1933.
A newspaper correspondent writes enquiring how populations might be assessed. "At what point does the 'deer population' of a forest become greater than the deer carrying capacity of the forest? And what constitutes evidence that the forest is carrying too many deer." He cites that in October some four years previously he had seen "at least thirty deer in a two hours afternoon walk along the Tauherenikau Valley track" but is assured that now at noon or in the afternoon he would not see a deer. He concluded that this was only evidence that the deer were more disturbed than previously, and not that they were more scarce. Within the previous fortnight an experienced stalker had shot one stag and two hinds in a two-day trip in the Tauherenikau, "but he shot them by stalking in the bush. . . . When country is more or less disturbed deer cease to be a wayside sight from tracks. They become more wary and do their feeding at night." At Christmas 1933 one party crossing the southern Tararuas reported four deer on the Beehives (4,870 ft) and another party saw three herds of deer, a total of 18, between Alpha (4,467 ft) and Hector.

Wilson reported, as at Christmas time, a large and destructive deer population in the Ruamahanga catchment particularly in the Ruapai and Cattle Ridge areas, five deer per travelling day being actually
seen. A list of plants which he considered unmistakably attacked by deer was included.


In February 1934, eight stags were seen on the Beehives. In January 1934, a tramper advised that “During the last two years the deer seem to have made a comparatively broad highway on the ridge from Shoulder Knob (on Crawford) down to the Otaki River and now that it is well blazed it provides good going and is very easy to follow”. During King’s Birthday weekend 15 deer were seen above the bush line on Mitre.


Wilson discusses the former apparent immunity to deer use of the southern Tararua "tops" between Alpha and Hector but states that during the previous six months deer seemed to be moving out on to these areas from, he thought, the heavily populated Hutt catchment, where their food supply would be seriously diminished.

ANON, 1934. Evening Post, 12 Apr 1934.

In April 1934 a grant of £10 was authorised by the Wellington Acclimatisation Society for the purpose of sending an investigating party into the Tararuas for a reliable report on conditions in order to determine the best method of culling deer and what funds would be required for such an operation.


Shooting success for the 1954 “roar” at Easter, reported a twenty-pointer shot on the western side of the northern Tararuas behind Tokomaru, and a sixteen pointer in a tributary of the Waikanae River. On the east stags reported as numbering 15 or 16 in a radius of five miles, in the Pahiatua district, were barking and breaking limbs of sapling macrocarpa. Odd reports for the autumn of 1934 amounted to some 40 animals seen (mostly in the bush) in the south Tararuas.

MCINTOSH, S. G., 1934. A DEVIOUS CROSSING; WAIOHINE - WAI-OHINE-ITI DISTRICT. Tararua Tramper 7, No. 2.

In recording a trip in the Waiohine headwaters, the area where Adkin (1912) found evidence of former glaciation, McIntosh refers to the roughness of the country. He remarks that “as yet but little attention has been bestowed upon the district; even deer have shunned the greater part of it, so that progress along the bush-clad spurs leading to it is a matter of some difficulty”. On what he refers to as Middle Spur between Aokaparangi [4,557 ft] and Maungahuka [4,515 ft] they were happy to find a deer track leading down the spur, to the Waiohine-iti [now Waiohine]. The following day they climbed back on to a bush knob on the north Maungahuka spur (now Concertina Ridge) “without a vestige of a track anywhere....” On their descent of the south Maungahuka spur next day they found “just prior to entering the bush there is an excellent tarn, unspoiled by deer....” but were disappointed at finding no game track through the windfalls on the easterly arm of the spur leading down to the Waiohine (now Hector) River. They then climbed on to the main Neill spur where they followed a good
deer track but this petered out and they had to negotiate dense leather-wood before reaching the Cone–Hector track. They "climbed to the deer infested Cone and then down to the Tauherenikau rapidly losing its picturesque flats by the ravages of erosion. . . ."


In Jan 1935 the Department of Internal Affairs commenced a deer-killing campaign in the Tararuas that extended through the following autumn, and in which 1,011 deer were killed, an average of 54.3 per week. For the first time hunters reported barking of kotukutuku (Fuchsia excorticata) by deer. The official report reads: The deer-infestation situation in the Tararua Ranges is singular in that, while deer are excessively numerous in some localities, they are scarce in others, but the latter are comparatively small and are widely separated. The whole area can, therefore, be regarded as having been pretty generally infested, and in places the concentrations of deer were, prior to these operations, so large that very serious damage has been done to the bush. . . ."

ANON., 1935. DEER CONVICTED; TARARUA DAMAGE. Evening Post, 21 Sep 1935.

Discussion of annual report of the Dept, of Internal Affairs and considered significant that only 28 goats were killed compared with 1,011 deer.

"LOOKING FORWARD". THE DEER MENACE. Dominion, 26 Mar 1936.

Report on erosion of Tauherenikau headwaters; considered that most of slips to be seen from Bull Mound and Cone Ridge have occurred within last 12 years.

SINCLAIR, R. 1936. AN EASTER TRIP IN THE RANGES. Tararua Tramper 8, No. 8.

R. Sinclair, on an Easter trip, confirmed the presence of dense scrub in the region of Puketoro, northern Tararuas, complained of by a party in January 1933. Past Nicholls (4,200 ft) they encountered a ten-pointer stag and the following day from Kahiwiroa (4,290 ft) recorded "Tarns were fairly frequent; plenty of deer about; stags could be heard day and night".

NEILL, W. 1936. A NORTHERN TARARUA ROUND TRIP. Tararua Tramper 8, No. 9.

Another Easter party recorded arriving at Tarn Ridge and disturbing several deer, which they considered were becoming increasingly numerous. "On Dorset Ridge alone we counted up to twenty head." On Girdlestone (5,090 ft), four or five stags within a radius of half a mile would answer an imitation of a stag's roar. Towards Brockett (5,020 ft) they were challenged by a ten pointer.


A review of the situation regarding deer and the forest in the headwater tributaries of the Hutt River. They remark "that numerous deer or other animals are required to clean out the undergrowth but once
it is depleted very few are sufficient to prevent regeneration”. They give an account of vegetation palatable to deer.

WILSON, G. B. 1938. MANGAHAO AREA. Tararua Tramper 10, No. 4. Wilson, recording a club tramp during the previous Labour Day weekend (October) reported: “It was apparent that the deer had wintered on the main range below Pukematawai, and the damage between Easter and Labour Day was obvious by the trampled and broken state of the high turpentine scrub. The ridge from the Mangahao to Pukemoremore was heavily deer tracked, and the tussock had been well grazed. Down in the Mangahao were plentiful traces of cattle.”

PRESS STATEMENT, 4 Feb 1938. DEER MENACE IN TARARUAS. A report credits a Masterton stalker as saying that “deer are increasing rapidly in the Tararuas and they will become a serious menace if steps are not taken to keep them in check”. In one afternoon, near Mitre Peak, he and his companions saw nearly 40 deer, and of the six they shot one was a fine eighteen-pointer; the average head round Mitre was estimated as ten to twelve points. In February, also, some twenty deer were seen on Totara Flats.

SINCLAIR, R. EASTER 1938. TE MATAWAI HUT. Tararua Tramper 10, No. 7. A party of trampers visiting Te Matawai via Gable End Ridge, and the notoriously muddy Richards Knob, found a “fairly good deer track” down to the Mangahao River on the first long bush ridge above where the main range and the Dora Track part company. Another day a ten-pointer led them to the top of Pukematawai, between which peak and Dundas twelve herds of deer were seen during the day.

ANON., 1938. DEER SHOOT, Evening Post, 7 Sep 1938. WAR ON DEER; DEER DESTRUCTION. These indicated the intention of the Dept. of Internal Affairs to conduct another deer-killing campaign in the Tararuas as deer numbers had greatly increased. The campaign took place between October and May and all private shooting was prohibited. (See also Tararua Tramper 10: 8.)

VIGGERS, D. A. 1938. SOUTHERN CROSSING, 16 JULY. Tararua Tramper 11, No. 2: 5. In July trampers noted game tracks in the snow on Omega.

NEILL, 1938. FIRST TRAVERSE OF PAKIHORE RIDGE. Tararua Tramper 11, No. 2: 2-4. Records in November a fine twelve-pointer on the main range and four others near Kime Hut.

IORNS, B. 1938. THE EASTERN TARARUAS. Tararua Tramper 11, No. 2: 7. Saw 40 deer one day tramping between Mitre Peak and the Waingawa River - Arete Stream confluence, via Table Ridge.

SINCLAIR, 1939. PARK RIVER - KELLIHER - PUKETORO. Tararua Tramper 11, No. 4: 5-6. Writes of having to negotiate dense leatherwood between Puketoro and Pukematawai.
SINCLAIR, 1939. GOAT CANYON – MAKERETU STREAM. Tararua Tramper 11, No. 4: 7.
Mentions deer in the Makeretu River.

Tararua Club members reported seeing 15 deer between the summits of Quoin and Alpha and others on the northern slopes of Alpha.

NEILL, W. 1939. WORKING PARTY TO ALPHA (Part 2). Tararua Tramper 11, No. 5: 3.
On the Marchant burn the only water available was that “which had accumulated in the hoof marks of deer around the former water-holes”.

Makes frequent reference to deer on a trip into the northern Tararuas at Easter (6 to 10 April). “At the Ohau Hut we met two deer cullers. . . . Leaving at 8 [from Te Matawai] on Saturday we made for Lancaster via Pukematawai. Plenty of deer were seen and heard as was the case all the time we were away. . . . The number of deer [in the headwaters of the Waiohine] was amazing and stags seemed to appear from everywhere. Crossing one grass flat we surprised a stag and his hinds. The stag turned on us and it was only by yelling and waving that we managed to stop his progress . . . Back to Te Matawai hut via the Carkeek ridge, and following a good deer track we arrived at the bush line two hours later. . . . One thing which we noticed was the lack of deer cullers, and unless more are put on the job they can never hope to keep the deer down and they will continue to increase.”

On the road into Mangahao Dam, “an interested deer, standing a few yards from the road watched us. . . .” “Two Government cullers were camped at this spot [at nearly complete MTC Harris Creek Hut].”

Between Elder and Dress Circle, “A well set up ten pointer stag stopped to have a second look at us but an eager bark from the dog caused it to hasten. . . .”

SINCLAIR, R. 1949. MANGAHAO – TAWIRI – NORTHERN OHUAU, ANNIVERSARY DAY. Tararua Tramper 12, No. 4.
“From Harris Creek hut to the Pipe Bridge [over Tawiri] was approx. ten hours' going, thanks to the deer tracks through the leatherwood.”

D.A.D. 1940. EASTER IN THE WAIWESTAEWALE. Tararua Tramper 12, No. 8: 4.
“Many deer were inspected but their heads were poor and our shooting consisted of a stag for meat. . . . The track we used up to Crawford was reopened by the cullers last year and was excellent going.”
NEILL, W. 1940. CRAWFORD – MAIN RANGE – WEST PEAK. Tararua Tramper 13, No. 2.

“As we moved along the ridge towards the Tararua Pinnacles we noticed five deer a short distance ahead of us and shortly afterwards it was evident they had walked into a trap for they were seen to climb to the restricted summit of Tunui, the first pinnacle, where they were faced by a precipice on three sides and we blocked their only way of retreat.”

HITCHMOUGH, V. V. 1943. KELLIHER – ORIWA. Tararua Tramper 15, No. 11: 2–3.

“The going [New Year 1943] being a decided improvement [descending to Otaki River from Kelliher] we elected to follow down this spur, and to our delight it was a clear and direct route with a good deer track, coming out eventually just south of a small creek some ten to fifteen minutes below our camp at Whio Pool. . . . The climb up Oriwa next day by the long spur bordering Murray Creek on the north [the south­east spur of Oriwa] was remarkably good to begin with, the deer having cleared a good track up to a point about a couple of hundred yards from the junction of our spur with another coming in from a more north-easterly direction. At this spot the ridge has been badly smashed about [by 1936 storm], trees piling themselves one upon the other, but even here the deer have forced a passage, making things if not good at least bearable.”


In May 1943 a note in the log book by U.S. Marines mentions two stags, about fourteen-pointers, being seen.

ANON, 1944. DEER IN TARARUAS. Auckland Star, 18 Jan 1944.

“This summer deer have been very numerous on the high country of the Tararua Ranges. A tramping party which recently crossed the tops from Masterton to Levin said that at no time while above the bush line were they out of sight or sound of deer. The animals were frequently encountered in herds of six and seven, and all day long the clatter of rocks dislodged by their progress could be heard. Many large stags with excellent heads were observed, and while the party was travelling up wind they often came within a dozen feet of an unsuspecting herd grazing on the tussock. At the top of one high peak a small fawn was found asleep, and when awakened it became so curious that the photographer of the party could not get his camera far enough away for a snap.”

GREIG, B. 1944. MITRE. Tararua Tramper 16, No. 11: 3–4.

“Deer on the skyline [on Mitre] were not bothered as we were by the piercing wind.”


“Before Walker [4,585 ft] we dropped off the ridge [for lunch] . . . deer had been plentiful along the tops [from Pukematawai], a total of 52 being counted including one herd of 12.”
“No deer at all were seen while in the Ruamahanga – two shooters at Mitre Flats said that 26 skins had just gone out. . . .”

“The deer have been along most of the ridge top [Ngawhakarara region] and in places the going is easy; in others it is not. . . . Survey tracks and marks within the scrub area are obliterated, and even the pipe on Ngawhakarara [2,800 ft] is buried in a mass of leatherwood.”

GUNN, J. 1946. ALPHA AMBLINGS. Tararua Tramper 18, No. 3: 9-10.
“The cullers had done a good job in this part of the range [Alpha-Quoin], not a single head of deer being sighted the whole day in the locality which was once over-run with the beasts.”

Arete – Tarn Ridge: “Even the deer were unused to man and therefore unafraid. They ambled past us without flickering an eyelash”.

Bill Davidson’s working party: “A slight deviation at the swamp on the southern side [of Omega] now enables you to cross and only be ankle-deep in mud instead of half-way to your knees.”

HITCHMOUGH, V. V. 1946. PAKIHORE RIDGE – KING’S BIRTHDAY WEEKEND. Tararua Tramper 18, 11: 2-5.
“The trip [from West Peak] . . . to McIntosh . . . had only one drawback – mud, good strong powerful stuff about the consistency of treacle. . . . On Sunday . . . we got away [from the bush line on Pakihore Ridge] and found quite good going down the ridge. The deer have numerous tracks and apparently frequent them quite a lot.”

“Arete . . . the usual sink-or-swim slog down to the hut [Te Matewai].”

“At 1400 hours we left Te Matawai [hut] and plugged quietly upwards towards Pukematawai. . . . To our amazement, there was no mud – it didn’t seem natural.”

HITCHMOUGH, V. V. 1948. OTAKI FORKS – CRAWFORD – MCGREGOR. Tararua Tramper 20, No. 3: 10-12.
“. . . camped that night [between Dorset Creek and McGregor] just inside the bush edge, getting water from a nice clean tarn some four or five minutes above the bush edge.”
NEIL, W. 1948. TWO NORTHERN CROSSINGS OVER TAWIRI. WALLY'S EXPEDITION OVER PUKEMOREMORE. Tararua Tramper 20, No. 4: 3–5.

"The leatherwood has not been cut [from Pukemoremore down to Mangahao River], but the deer have been through and no real difficulty was experienced."

HITCHMOUGH, V. V. 1948. TWO NORTHERN CROSSINGS OVER TAWIRI: VIVIENNE'S TRIP BY WAY OF NGAPUKETURUA. Tararua Tramper 20, No. 4: 5–6.

"... decided that instead of going down the spur off Hines [3,895 ft] we would drop down the long spur from the top of Ngapuketurua [3,588 ft] to the Harris Creek – Mangahao River junction ... later learnt the spur [off Hines] not the best going, there being for some distance a fairly healthy growth of leatherwood through which even the deer had made little head."

HITCHMOUGH, V. V. AT LAST! Tararua Tramper 20, No. 5: 6–7.

Otaki River to Kahiwiroa: "... the ridge [from ca. 800 ft up from mouth of Kahiwiroa Stream to bush line] was really good going, with deer tracks. ... We passed a good many small tarns which should contain water, even after a dry spell, so that it is unnecessary to carry any from the river. ... The deer have a track which leads easily through the leatherwood belt and out to the grass on Kahiwiroa."

WHITTAKER, R. J. 1948. THE HOLDSWORTH TO MITRE TRIP. Tararua Tramper 20, No. 6: 5–6.

"Between Jumbo (4,600 ft) and Angle Knob (4,850 ft) ... sight of several deer startled by our invasion of the tops. ..." At McGregor: "... we had seen 37 deer since leaving Jumbo, and the day's total was probably about 50."

SHAW, C. 1948. UPPER TAUHERENIKAU GORGE. Tararua Tramper 20, No. 8: 10–11.

"When the ridge [off Maungahuka] split, they went to the right (S ridge) ... down the clear deer highway to a tarn." Later lost deer track and had to negotiate leatherwood, then supplejack leads to Hector River, about 20 mins. above Neill Creek.

McCALLUM, GRAHAM. 1949. ANNIVERSARY DAY WEEKEND; WAIHOHINE RIVER. Tararua Tramper 21, No. 7: 2–3.

"We dropped straight off Pukematawai down to the Park River ... The floor of the valley basin is covered in very high snowgrass – rather unusual in the Tararuras. Further down, grass and leatherwood alternated, with good deer tracks through the latter."


Route down to Hector forks (from Totara Flats): "... from a narrow shelf about 300 ft above the river. A deer track marks a very steep but negotiable spur on the left of a long narrow shingle slide."
McKENZIE, G. 1949. FROM PUKEMATAWAI TO KAITOKE BY THE TOPS. Tararua Tramper 21, No. 7: 10-12.

"After Butchers Knob [from Pukematawai] we ran into leatherwood .... After the turn-off from Kelliher the track became much better...."


"... the leatherwood in this region [Ngapuketurua to Harris Creek] appears to be suffering from a disease, as large areas are dying out."


"Navigating on to the ridge [from Waiopuhu] we found the going unexpectedly easy. Though there is quite a bit of leatherwood the deer have opened the ridge up a lot, and as far as Oriwa proper there is a blazed track.... Camp was finally made ten minutes beyond Notoriwa, near a deer wallow.... Going [on the 'tent ridge' beyond Notoriwa] was impossible on the crest [windfalls] and we followed deer tracks, which mostly sidled on the western side. ... The ridge is a good example of smashed-up country. ... In the badly blown parts, almost all the trees had been smashed or uprooted, letting in abundant light to the bush floor. Most of the second growth consisted of a harsh-leaved tussocky sedge and a large grass, each rising to about 3 ft. 6 in. Also noted were horopito, water fern and stinkwood. ... Further down ... lawyer, supplejack, some kiekie and flax and hookgrass."


"Here [at bush line across Otaki River from Te Matawai] there is a clearing in the scrub made by the deer, and a small pool of water. A good cut has been made through the scrub over a bump or two and a rise of 500 ft takes one on the main range between Butchers Knob and Pukematawai." (Barra track.)


"The track [up true right of Otaki Gorge] gave fairly good going... pushed off along an old deer track... We pushed through the bush at the top on to the backbone of the spur [via a big slip in tributary of Penn Creek], where a deer trail ran up. The track was rather old ... the leatherwood seemed endless ... barely out of the scrub when we hit the track down to Field hut, a little below West Peak."

CRUSE, J. 1950. HIGH RIDGE – HOLDSWORTH. Tararua Tramper 22, No. 8: 5-6.

"... up Totara Creek about 250 yards before turning left, and up into the bush. A few minutes' struggle with undergrowth brought us on to the ridge with a deer trail and an old blaze.... At one point I heard a crackle of twigs breaking then a peculiar noise, and not more than 10 yards away was a big stag roaring at me. It came forward a few feet, then, as I did not respond to its advances, it retreated in good order and without undue haste ... we came out on Flaxy Knob."
“A steady plod up [from Te Matawai hut] through snowgrass and mud to the top of Pukematawai . . .” (25-26 July 1953).

“There is [i.e. 1928] a rough track skirting the river [true left of Waingawa between Cow Creek confluence and Mitre Flats] where deer, like ourselves, have been flood bound, and though it is full of obstacles for men with heavy packs the ground is trodden fairly clear.”

PEATTIE, J. 1954. OTAKI ROUNDABOUT. Tararua Tramper 26, No. 6: 2.
“...after moving downstream [Hector River] about half a mile found a likely-looking spur leading to Maungahuka. This ridge turned out to be a beauty and we quickly gained height in spite of having to use the slasher in patches, finally getting clear of the bush at 11 a.m. A little further up the ridge we found a tarn. . . . This ridge runs south from Maungahuka. . . .” (cf. McIntosh, Tararua Tramper 7, No. 2.)

CARTER, T. 1955. BANNISTER BY STRATEGY. Tararua Tramper 27, No. 9: 5.
“We tramped up to Pukematawai, pausing on the way to rouse a young stag, who had chosen to make his bed beside the track.”

“For the next two hours of our way to Notoriwa the travelling became quite a bit easier, with occasional deer and goat tracks amongst the windfalls.” Past Notoriwa: “...travel became decidedly worse, with lawyer and cutty grass eight to ten feet high. Short second growth added to the general difficulty.” Next day: “Two hours of rather hellish going through the same sort of country as the previous afternoon. . . .” They took a spur to the Waitewaewae River: “Two hours down a fair deer trail saw us . . . in the river. . . .”

“A few stags idly watched us pass, as we left Tarn Ridge. They didn’t seem concerned about the new deer-culling hut being built about a mile away on Dorset Ridge.”

IORNS, B. 1956. RED DEER IN THE WAIRARAPA. Tararua Tramper 28, No. 9.
This is a record of three deer shipped to New Zealand in 1862 in the “Prince Consort” and liberated [by Jas. Robinson] on the property of Charles Rooking Carter [his brother-in-law] along the Ruamahanga River, east of Carterton. Even in Robinson’s lifetime a runholder in SE Wairarapa had contracts for several years for killing 3,000 deer annually. In 1902 stalkers prevailed on the Government to have 32,000 acres proclaimed a sanctuary for deer—the Haurangi Forest Government Reserve. About 1903 Henry Holmes packed into Mitre Flats
several young deer which had been hand reared; next morning they were back where they had been brought up. Later, two further lots were packed into Mitre Flats.

ELDER, NORMAN. 1955. TARARUAS; ECOLOGY AND MYTHOLOGY. Tararua, No. 9, pp. 79–81.
“Things have changed [after 20 years], but even if you leave them alone things don’t stay put. It was a jolt to see how the Tararuas have altered. All along the main range, across the Waiohine, the bush was no longer a dark green carpet, but moth eaten and tattered with scrub and tussock showing pale in the gaps. Some of the biggest gaps on exposed shoulders could be put against the February, 1936, gale, but most of the damage was too widespread and too varied to be caused by this alone...further along the range [Holdsworth-Mitre] looking into the head of Dorset and South Mitre Creek, there were more surprises, this time due to deer...a cherished axiom that Tararua leatherwood...is unique and changeless. Now whole belts of leatherwood were dead, dead stems stripped of foliage on bare peat trampled like a stockyard...We were beginning to see deer now [between Angle Knob and the Kings]...Pete shot several in one basin to do a check on their condition...From Girdlestone...into head basin of the Waingawa...More deer, more shooting, more dead leatherwood...Next morning we split, some of the party to go to the upper fork under Bannister, the others up to Tarn Ridge, to look for a hut site...I am satisfied that the most urgent need is for the control of deer in the least accessible valley, the Waiohine, and the interests of trampers must come second to this. The siting of a hut on the Dorset Creek bush line, well down, seems the best solution...After a night at the Forks we took off up a steep spur on to the Bannister Ridge, again through a scrub belt devastated by deer...Pete had shot a couple of stags the previous night [bringing the tally of deer seen up to about 150].”

CRAWFORD, R. 1957. TARARUA PEAKS. Tararua Tramper 29, No. 4: 3.
“Those in front pushed on up to Maungahuka, while the majority of us sneaked a sidle below them on to the southern ridge, where a tarn invitingly sparkled.”

“This [the Park] is a really lovely valley...Unfortunately it contains some of the worst examples of the damage that burning and deer can cause. In the small patches of bush containing trees of Hoheria sexstylosa (in profuse flower) and Griselinia littoralis the undergrowth is completely eaten. Though the leatherwood has been damaged to a certain extent, it is the tussock grasses - the broad-leaved variety - which has suffered most. Large areas of this have been eaten.” (February 1956.)

FEDERATED MOUNTAIN CLUBS OF NEW ZEALAND, 1958.
STATEMENT ON NOXIOUS ANIMALS. Tararua Tramper 31, No. 2.
Statement to the Minister of Forests.
"DEHYDRATED". 1959. ROASTING ON THE MAIN RANGE. Tararua Tramper 31, No. 5.

"... we progressed [from Butcher's Knob] on hands and knees ..." to Dracophyllum Knob. "... a drink from the tiny pool in the saddle below refreshed us for our climb through the high snowgrass and hidden logs to Puketoro. A sheer bluff south of Puketoro necessitated a descent of approx. 100 feet, the crossing of a shingle slide, and a climb on unstable rock. Bill shot a stag a few minutes later ... A meal was cooked at the waterhole between Kelliher and Nichols; camp made on Nichols Col, the evening meal being cooked on a dry waterhole."

PURDIE, J. 1959. TARARUA PEAKS—HECTOR RIVER. Tararua Tramper 31, No. 4.

"I found it not quite so hair raising as I had anticipated [the 80 ft chain on the Peaks], but I sympathise with the deer in making their long detour round it."

COVENTRY, R. 1959. CONVALESCING. Tararua Tramper 31, No. 6.

On Pukematawai: "A few contented deer greeted our arrival with indifference."


The author, a keen observer, makes no mention of deer or damage by them in 1909.

RODGERS, M. 1958. EASTER IN THE NORTHERN TARARUAS. Tararua, No. 12, 68–70.

"Dipping through the saddle to Arete [from Pukematawai] we spotted a couple of deer well down in the scrubby head of the Park Valley ..." Next day on Dorset Ridge: "... two more deer were despatched."

ELDER, N. L. 1959. INTRODUCED ANIMALS CHRONOLOGY. (Unpublished lecture notes, NZFS Noxious Animals Division course, 1959.) 1928, Deer mob of 100 on Totara Flat.


A tramper’s “attempt to review the problem by assessing recently published information and opinions.”


"We surprised a stag at the tarn [on Maungahuka], which watched us for quite a while before disappearing from our view ... arrived at Andersons [NZFS hut] ... We had seen many deer during the day, but they were just blurred images in the mist as they ran away."