

Information Paper



Centre for Resource Management

University of Canterbury & Lincoln College, New Zealand

Paper for Platform Presentation
Grazing Industries Symposium
2nd International Range Congress
Adelaide May 1984

ADMINISTRATIVE AND MANAGERIAL RESPONSES TO
CHANGES IN ECONOMIC AND ECOLOGICAL CONDITIONS
IN NEW ZEALAND TUSSOCK GRASSLANDS

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1986

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Information Paper No.5
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Lincoln College
Canterbury

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Highlight: Analysis of South Island, New Zealand pastoral history reveals that legislative and administrative responses have generally lagged behind ecological and economic stimuli, in reach of its three stages: range occupation, range deterioration and pastoral restoration. Such lagged responses prompt the question: how can public policy better take into account discernible ecologic and economic trends?

The Problem and a Hypothesis

Throughout modern history, those legislating for, administering, leading and conducting grazing industries have been challenged with maintaining or improving productivity while conserving the resource base. Fluctuations in climate, or in markets sharpen the challenges. Changes in ecologic and economic conditions can arise endogenously as well as from such exogenous features as climate and markets. Induced changes in soil and vegetation, for better or worse, affect later grazing enterprises. Like wise commercial success or failure in one period can greatly affect subsequent economic conditions. Both improvement and deterioration in ecologic and economic conditions therefore tend to be compounded. Our responses may undershoot. How do private interest managers and agencies of the public interest respond to such changes?

The present paper summarily examines the ecologic, economic, legislative and administrative record of South Island tussock grasslands, a substantial area of the grazing industry on which New Zealand has depended. The hypothesis is advanced that in the three different stages of this grazing industry: establishment (from about 1850 to 1870s), deterioration (from 1870s to 1950s), and restoration (from 1950s to the present), economic and ecologic signals of change are responded to most slowly by those involved in administration and legislative guidance of the industry. Some entrepreneurs and managers may respond to such stimuli more readily but lagged institutional responses tend to prevent managerial responses from being fully adequate or effective.

STAGE 1: OCCUPATION OF EMPTY RANGE IN NEW NEW ZEALAND TUSSOCK GRASSLANDS
 Pastoralism was unintended in the official European colonization of New Zealand in mid 19th century. Wakefield planners had visualized from Britain that land would be sold at regulated "sufficient price" for agricultural settlement, proceeds financing the infrastructure of the new colonies. Cheap land was opposed, to ensure that labourers did not acquire land thus depleting the available labour force. Colonization was to be promoted in this way in designated areas so that dispersal would be avoided, expansion of the frontier controlled and class relationships regulated. So much was policy.

As has been pointed out by O'Connor and Kerr (1978) from Sinclair (1959) and other sources, events happened differently. Agriculture initially languished, from shortage of labour, smallness of local market and a disposition of the early settlers, even on the open Canterbury plains, to deal more in urban land and chattels rather than in energy-demanding, "sod-busting" agricultural developments. In North Island, where much of the land was forested tribal Maori agriculture, provided vigorous competition in local and export markets. Some enterprising European settlers with capital, learning from Australian example, turned to pastoralism rather than agriculture for investment.

Capital investment in pastoralism was principally in sheep, for labour requirements were relatively small and purchase of land was not essential. Illegal leases were obtained from Maoris or makeshift leases from the New Zealand Company. Drought in New South Wales in the 1840s and favourable wool market prices gave impetus to the pastoralization of open range. Pastoralism first occupied the limited open lands in south eastern parts of North Island from 1844, soon filled the open country in the northern parts of South Island and then spread quickly through the grasslands of Canterbury, Otago and Southland (O'Connor and Kerr, 1978; Gardner, 1981; Webb, 1957).

Colonial administrators felt obliged to augment inadequate land sales revenue by leasing land to pastoralists. In justifying this legitimization of a new and unsought grazing industry, they represented it as a transitory expedient. In 1851 Governor Grey introduced the system

of cheap pastoral licences which Australian squatters had secured as imperial policy. This attracted pastoralists to the Crown lands outside the confined settlement blocks, because Crown licences were generally cheaper. Maximum capacity was 25,000 sheep. Licences were for 14 years. Licence fees were five pounds per annum with the further fee of one pound per thousand sheep above 5,000. Grey was himself opposed to pastoralism and in 1853 lowered the purchase price of rural land to promote agricultural settlement to counter it. Unwittingly, he thereby allowed pastoralists to consolidate their pastoral holdings by selective freeholding.

The devolution of "wasteland" management responsibility to Provincial Governments in 1853 had the effect of ensuring that dominant pastoralist interests in such Provincial Governments in South Island would maintain the drive for pastoral occupation of all available territory. By 1865 it was complete (O'Connor and Kerr, 1978).

Although New Zealand colonizing policy was for agricultural settlement, ecologic and economic realities dictated that progress on such a basis would be slow and painful whereas the same realities favoured pastoralism. Despite intentions otherwise, the New Zealand colonial economy was founded as a pastoral economy, derived from eastern Australia and dependent on London wool markets (Gardner, 1981). Furthermore, the failure of the administration and legislature to perceive and adapt to the reality of the colonial economic situation prevented the development of a system of pastoral tenure which would attract pastoralists and at the same time prevent arable land from being locked up in large estates (Webb, 1957). By failure to read economic signals, colonial administrators managed to achieve exactly the opposite of their stated initial policy. Continued tardiness to recognize and respond to ecologic and economic portents, destined the newly established grazing industry for trouble.

PHASE 2: LIVESTOCK ERUPTION, RANGE DETERIORATION AND LIVESTOCK DECLINE

The eruptive phase

On land occupied for pastoralism, initial and recurrent firing of the coarse grasses and scrub had induced a sheep habitat. Financial speculation in pastoralism, fluctuations in wool prices and in the fortunes of both banking houses and borrowers, and lack of outlet for surplus mutton, ensured rapid increase in stocking load on the native grassland range.

Figure 1, compiled from statistical records for the provinces or land districts of Nelson, Marlborough, Canterbury, Otago and Southland, reveals the eruptive phase of sheep numbers on unimproved range to 1871. The slower rise over the next 20 years was accompanied by a more rapid increase in area of sown pastures which continued into the 20th century. It is difficult to escape the conclusion that the nearly 8m sheep on unimproved range by 1871 was a non-sustainable population. The rapid increase to 1901 in the calculated ratio of sown pasture area per 1000 sheep, indicates the severity of earlier overstocking on unimproved range.

Deterioration in tussock grasslands as a result of fire and grazing, a combination of factors to which they had not been subject in pre-European times, had been noticed from about 1860 by land surveyors and their associates principally in semi-arid districts, (O'Connor and Powell 1963, Blake *et al.*, 1983). Invasions of rabbits and successive falls in wool prices aggravated the plight of pastoralism. Gardner (1971) points to the serious level of indebtedness among Canterbury runholders even by the late 1860s. It was to worsen: "By the late 1870s the New Zealand economy was saturated with debt." (Gardner 1981). How did administrators and legislators react to such portents?

The Development of National Pastoral Legislation

Following the abolition of the provinces, the national legislature consolidated provincial pastoral land tenures in 1877. This Land Act, which set the general pattern for pastoral licence tenure for more than 70 years, made no distinction between pastoralism in the lowlands and that in the highlands. Pastoralism, as then practised, was essentially a speculative and exploitative adventure and was legislated for as such. Pastoral licences were for 10 years, giving the right to pasturage only and were determinable by the Crown on 12 months notice. Rent was set by the highest bid at auction. At expiry of term a sheep run was again to be put up for auction. Run size was limited to a carrying capacity of 5000 sheep.

Within five years the legislature amended this Land Act to increase the term of licence to a maximum of 21 years and to increase the size limit of runs to 20,000 sheep. Three years later the "small grazing run" tenure was also introduced, granting a lease for 21 years at upset rental of 2½ percent of value of fee simple and with a size limit of 5,000 acres, raised to 20,000 acres in 1887. In 1888 the first provision was enacted for classifying land either as exclusively pastoral land or as pastoral-

agricultural land. Only on the latter were pastoral licences to be determinable on 12 months' notice. Pastoralism was thus made legislatively secure by the time it had been all too sadly demonstrated that it was both ecologically and economically unstable.

Managerial and Administrative Responses on the Lowlands

Managers and runholders on arable lowlands had responded by mid 1870s to declining range condition and economic stress with sown pastures and with crops for harvesting. Gold rushes and promoted immigration had led to expanding local food markets. Markets for grain were initially good, even to Australia, but declined within a decade. Market development for mutton by the promotion of refrigerated sea transport was the most significant response by grazing industry leaders. From 1882 when refrigerated meat was first successfully exported to Britain, there was constant economic stimulus for sowing of more productive pasture. Runholders on the lowlands generally converted their runs to large farming estates. The 1889 election of a Liberal government, dedicated to wiping out these large estates, accelerated the process of conversion of lowland pastoral land to farmland. The threat of land acquisition for settlement, the creation of new credit facilities and of the Department of Agriculture all contributed with actual purchase of estates to the demise of lowland pastoralism and its replacement with mixed farming.

Managerial and Administrative Responses to Early Stresses in the High Country

In the hill and high country which remained as rangeland, managerial and administrative response to economic and ecologic deterioration was markedly divergent from that on the lowlands. Oversowing of rangeland without cultivation was apparently fairly widely practiced, often with cheap seed mixtures. New energies were devoted to belated planning and erection of rabbit-proof fences. Station diaries of the period of the 1880s indicate some concern for feed supplies and livestock thrift but little sign of understanding of basic causes of such problems. Rabbits were increasingly blamed for the deterioration of grazing, and agitation for their control increased. Following Otago provincial enquiries into the rabbit nuisance in 1875, the first Rabbit Nuisance Act was passed by the national Parliament in 1876. Although the bloom was now gone from the prospect of pastoralism, run turnover remained fairly high. Financial failures were not uncommon.

Increasingly investors in pastoralism aimed to secure frugal, capable flock-managers who could keep down both costs and stock losses.

High country pastoralism was exempted from the public zeal for land reform which marked the first Liberal government. Indeed, the Government responded with humane sensitivity and discernment to the plight of high country runholders after the destructive 1895 snowstorms. In promoting a Pastoral Tenants Relief Act, the Minister of Lands claimed that the Crown's interest in high country pastoral lands would suffer if the runs were not restocked! (O'Connor, 1978).

From this it may be surmised that the land-reforming politicians and administrators were apparently just as impervious to ecologic signals as had been the protagonists and practitioners of continued exploitative pastoralism.

Managerial and Administrative Responses to Continued Deterioration

There was little formal scientific investigation of tussock grasslands in the 19th century. Station records and diaries were not generally available but they now allow those wise after the event to recognize poor lambings, high mortalities and low wool weights as signs of chronic or recurrent malnutrition. Vegetation that would not carry a fire is now evidence of depletion. Sometimes investors blamed the managers. Frequently managers blamed the weather or rabbits. Traditionally, shepherds blamed the station cook! Low livestock performance and high mortality became accepted as the high country norm.

Another set of signals was available but apparently ignored, county agricultural statistics and sheepowners' returns. Although there were successive Commissions of Inquiry into aspects of high country pastoralism in 1905, 1910, 1920 and late 1940s, there is no evidence in their reports of comprehensive analysis of the pastoral record. Figure 2, collated from two recently published studies (O'Connor, 1980; O'Connor and Kerr, 1978) show the fluctuations and generally downward trend of livestock load on two contrasting high country terrains from 1900 to 1952. Comparable analyses for other districts produce similar patterns although no decline as serious as that for Vincent and Lake Counties in Central Otago. The sustained

increase in stocking load during the great Economic Depression indicated managerial response to depressed markets for wool and store stock. Major reductions associated with climatic disasters such as drought or heavy snow indicate the belated lowering of estimations of carrying capacity. By the 1940s both pastoralists and administrators recognized that overstock had occurred in the past but were loath to admit that it might still exist.

Following the Commissions of 1905, 1910 and 1920, amendments to legislation tinkered with perceived problems such as rabbits, burning and weeds and tried to deal with alleged insecurity of tenure. Under pressure for more pastoral opportunities, administrators periodically concerned themselves with provision for further settlement by subdivision of larger runs. Many such attempts were of limited success, again indicating unduly optimistic expectations. O'Connor (1978) has traced the coalescence of Upper Waitaki properties subdivided from large runs, amalgamation often occurring within two decades of their partition. From 1922 to 1948 all pastoralist runholders had the right to convert leases to effective freehold titles. In that period only ten purchases were made, all but three before 1930 (Blake *et al.*, 1983). Reviewing the complex and chequered amendment and application of land laws, Blake *et al.*, (1983) concluded that the administration of the pastoral high country in the period up to 1948 revealed no consistency of purpose.

Recurrent commissions of inquiry and legislative adjustments along with continual ecologic and economic adversity developed great resilience, tenacity and solidarity among runholders, manifested in the emergence of a highly effective lobby, the High Country Committee of Federated Farmers (McLeod, 1975). Pastoral spokesmen had argued well for their cause before the Sheep Industry Commission in the late 1940s. They cited inequitable treatment at the hands of the Lands Department administration and cast doubts on the charge against pastoralism that it caused soil erosion.

Public concern for environmental quality had its first major expression in New Zealand through the Soil Conservation Movement from the 1940s. High country of South Island became one focus for this concern (Cumberland, 1944; Gibbs *et al.*, 1945). New agencies, more professionally oriented than the Department of Lands and Survey which had maintained throughout

an essentially administrative character, disturbed traditional pastoralism. Botanists, pedologists, geologists and hydrologists brought new understanding of the ecological processes of nature and culture. Foresters reclaimed earlier forest boundaries, began replanting and led the extermination of wild ungulates. Agronomists introduced new cultivars for revegetation and pasture improvement. Soil conservators regulated burning and promoted conservation plans. The interacting behaviour of central government and regional bureaucracies with now beleaguered pastoralists paralleled the saga of land and water politics in the western United States (McConnell 1966) and many of the features of bureaucratic behaviour and interaction portrayed by Downs (1967). What had been exhibited in New Zealand was the painful evolution of and profound attachment to a way of life that had its own rigour, its own mystique and shared with its physical environment its own magnificence. Respect for these qualities of life among those who dealt with high country pastoralism from the outside contributed to its survival. Little wonder that pastoralism emerged from the 1940s with a new Land Act, the prospect of concessional rents, perpetual rights of lease renewal and soil conservation programmes that could be turned to pastoral benefit.

STAGE 3: RESTORATION OF PASTORAL VITALITY

Response to Opportunity for Range Improvement

The celebrated but belated 1948 Land Act articulated a place for pastoralism in the land use spectrum, on land classified as suited only to pastoral purposes, not to farming. Community action achieved rabbit control. Limited foreign wars temporarily inflated wool prices. Pastoralism at least to some people again seemed possible. Such quiet restoration was not allowed to be. Aerial topdressing and fencing technology, four wheel drive range vehicles and above all the discovery of nutrient deficiencies and highly productive responses in oversown legumes made conventional pastoralism increasingly irrelevant in the pastoral use of the high country. High country now had a farming future, although Land Settlement Board for decades declined to recognize it by reclassifying as farm land that held in pastoral lease.

Thirty years later, the currently accelerating increase in livestock on high country runs (Figure 3) renews the question whether land legislation and administration will be responsive to economic and ecologic trends. Increases in livestock numbers and production now come from pasture

improvement where from five to ten times more stock load is carried than on comparable unimproved terrain (O'Connor et al., 1982). Consequent increases in land values have dramatically altered the relevance of earlier established rentals (Kerr et al., 1979). Renewed public and commercial interest in recreation in the mountains, extension of public concern for nature conservation to native grasslands, shrublands and wetlands, and increasing evidence of production potential in timber and water as well as pastures, led to enunciation of new integrating policy for high mountains (N.Z. Government, 1979). Land Settlement Board incorporated its goals in its own revised policy (LSB, 1980) without materially changing its orientation as a benign pastoral landlord. The revised basis of rentals in the 1979 Land Act Amendment provoked sufficient pastoralist response and public interest to generate yet another Committee of Inquiry (Clayton Committee 1982). Its findings and the subsequent recommendations to Government from the Land Settlement Board, while designed to accommodate public recreation and nature conservation with pastoral farming, may yet serve to perpetuate the status quo. Schon's (1971) dynamic conservatism has become a powerful and relevant tool for interpreting the behaviour of both governmental and non-governmental organisations. What had been territory of public interest neglect as the concern of pastoral representatives and pragmatic administrators alone has now become a maelstrom of activity involving central, regional and local government agencies and sectoral interest advocates of many kinds (Kerr et al., 1984). As Blake et al., (1983) have pointed out, satisfactory decisions about future use of pastoral high country cannot be made from the bounded perspective of sectoral viewpoints as in the past.

Conclusion

When faced with new opportunities for pastoralism our first investors of risk capital outwitted the restraints of Government. In a long period of consequent pastoral degeneration where carrying capacity was repeatedly exceeded, runholders contrived to maintain their land hold and solvency, with little effective attention by Government to the public interest. In the present renewed opportunity, is there any way in which public policy can learn from changing conditions or must it respond only to pressures and preconceptions?

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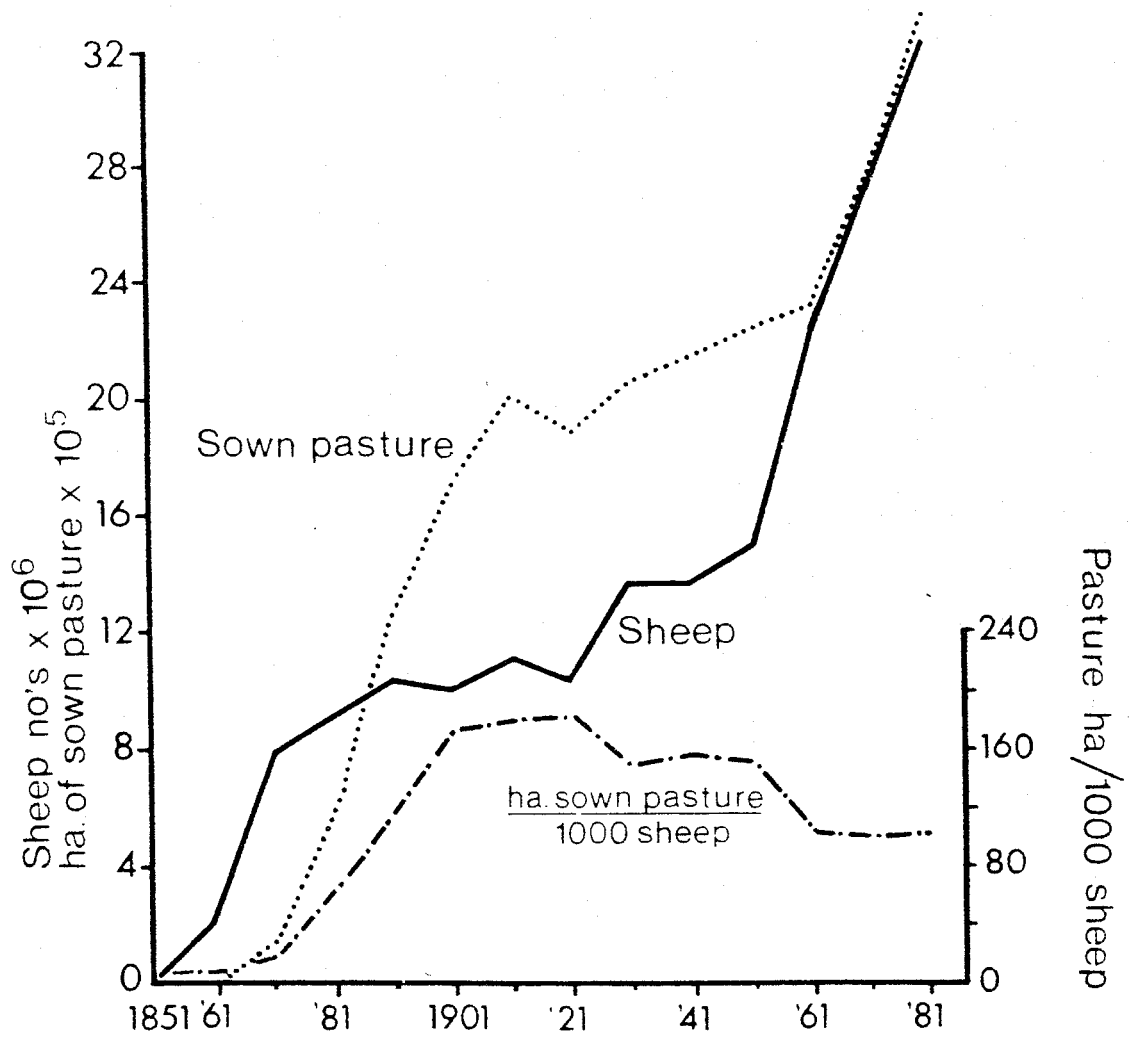


Figure 1. Sheep numbers and the Area of Sown Pastures in South Island New Zealand (excluding Westland) at 10 year intervals from 1851 to 1981.

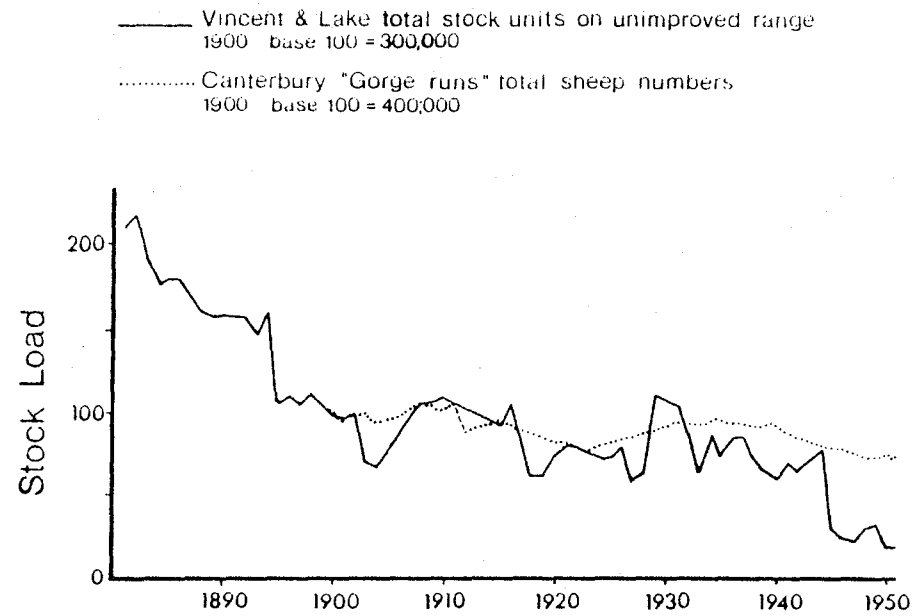


Figure 2. Changes in stock load on Canterbury sheep runs in the humid gorge country from 1900 to 1952 in comparison with changes in stock load on unimproved range in Vincent and Lake County over a longer period.

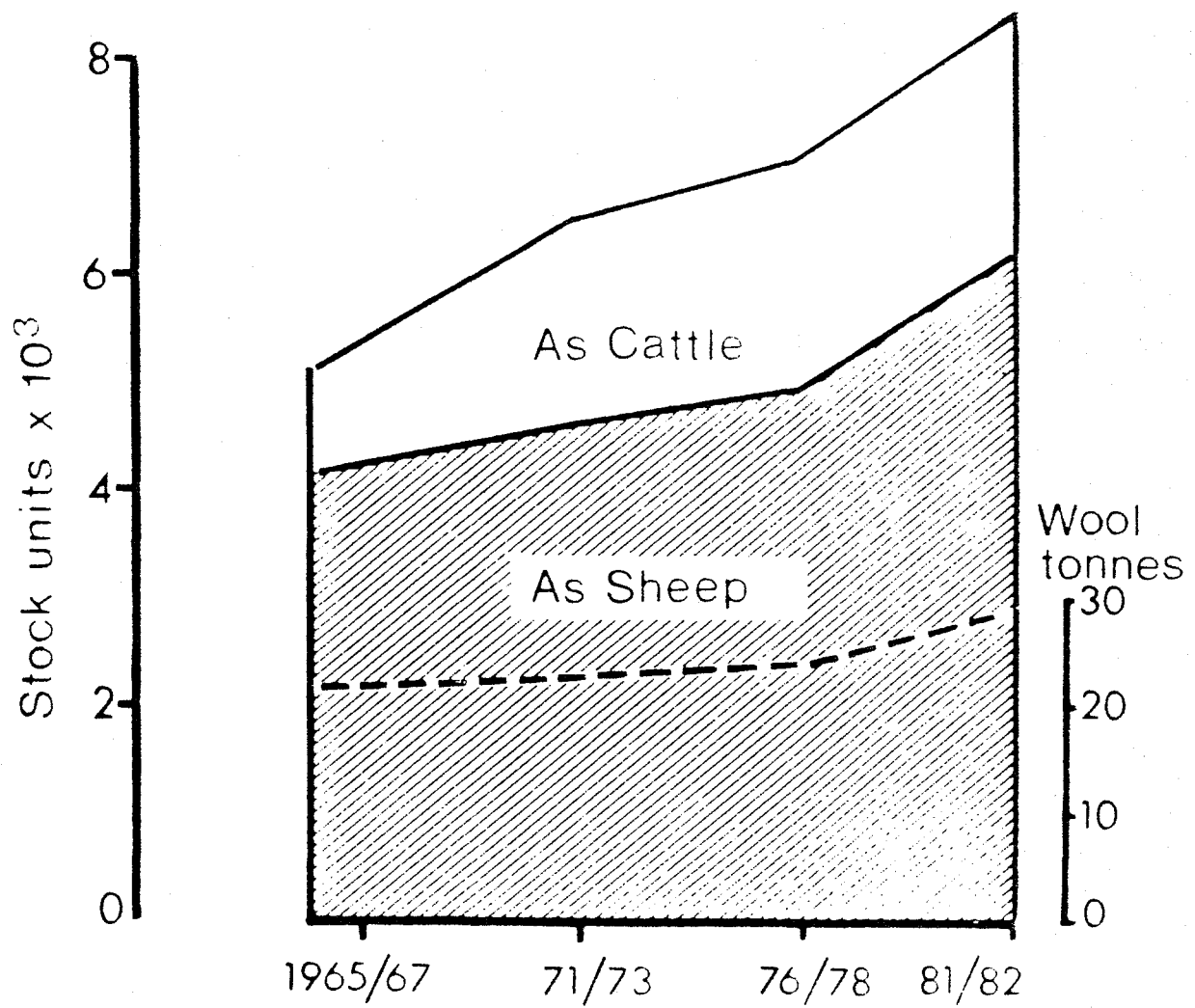


Figure 3. Livestock load as adult sheep equivalent stock units and wool production per high country pastoral run at successive complete enumeration surveys from 1965/67 to 1981/82 (Deer in 1976/78 and 1981/82 are not shown)

