

## Sambar (*Cervus unicolor*) in Sand Hill Country

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The sambar (*Cervus unicolor*), a large uniform brown-coloured deer from India and Ceylon, was liberated in the sand-hill country at Carnarvon, near the Rangitikei River, in 1895 (Thomson, 1922). Since then it has colonized a coastal strip of about 63 miles in length, extending between the Waitotara River on the north and the Hokio River on the south. The width of the coastal strip now occupied by sambar is variable and reaches a maximum width of about six miles, north of the Rangitikei River.

In India, although they are generally known as a forest-loving animal, they are usually close to water, and bed for the day near a water-course. They are said to prefer thickly-wooded hillsides in the vicinity of cultivation . . . "it is a mistake to think that the centre of some vast forest remote from the past or present habitation of man will contain many sambar. It is quite rare to find more than a few deer in such places" (Brander, 1923). The same author indicates that, although sambar are known to browse, their chief food is especially coarse grasses growing along banks of streams.

In the Wanganui–Foxton sand-hill country, sambar are associated particularly with dense cover of manuka scrub, fern, and lupin, and with swampy areas adjacent to farm country. Their spread has been into similar habitat north and south of Carnarvon and, insofar as is now known, not inland into indigenous forest areas.

Present records suggest that the main period of antler growth is January, through March. Examination of 44 adult male sambar was made in all months of the year; the only ten of these sambar whose antlers were in velvet were collected in January, February, and March. From these records, there is no suggestion that there is anything but a fairly well-defined period of antler shedding and growth. This conforms to the regular pattern of antler shedding known to occur in India (Brander, 1923; Simon, 1943), and the period is approximately the same as the equivalent season, at comparable latitudes, in India.

Full-term embryos or very young fawns have been recorded from the sand-hill country in March, April, July, and September. Since the gestation period is six months (Simon, 1943), these records and other estimates based on very young embryos suggest that mating has taken place in January, March, August, September, and October.

It is clear that the breeding season differs from that described in India in that it extends over a far greater period. In Bombay, the mating period is in June and July (Simon, 1943); while in the Central Provinces, it is recorded as in the end of November and in early December (Brander, 1944). It is not clear from present records if there are two seasons in New Zealand, or if breeding occurs throughout the year.

To what extent the requirements of sambar and of sheep overlap is not known, but they exist, without apparent conflict, in the same general area. A sambar was observed about 100 yards from a band of sheep as it ran across an enclosed pasture. The sheep stopped feeding to watch the deer, but were not disturbed by it.

Cattle apparently do not tolerate sambar, and when cattle are turned into an area, the deer move, presumably to nearby areas of suitable habitat. On the 15th and 16th of October, 1955, with a party of local hunters, an area near the mouth of the Rangitikei was hunted. This area was reputed to be one of the most dependable areas for locating sambar. However, since the last visit of the party of local hunters whom I accompanied, cattle had been introduced and were present in large numbers, in bands of about 50. No sambar were seen on this hunt. Only one deer track was observed, and that was in an area densely covered with manuka (*Leptospermum scoparium*). Mr. Simson, a runholder with twenty years' acquaintance with sambar, recalled an incident that occurred near Bulls. A hunted sambar stag got into several fenced cattle pastures, and cattle chased the sambar out of each pasture (oral communication).

One of the most successful shooting systems

employed consists of a line of beaters moving toward two or three shooters on fixed stands. Using this system, one party which averaged twenty hunts per year, shot eighteen deer per year for the five-year period, 1952-56.

The sambar are not generally recognized as constituting a serious economic problem to local runholders. The deer provide sport, venison, and salable skins. The meat is sometimes used as food for the farm dogs.

Because of the restricted habitat available to sambar in the sand-hill country, and the constant hunting pressure that is likely to continue with deer unprotected, these animals are unlikely to become a serious threat to future grazing interests in this area. Controlled local shooting has apparently been sufficient to satisfy requirements for protection of young exotic forest trees from sambar.

As scrub land is brought into production, and as swamps are drained, sambar habitat can be expected to decrease. As sand dunes are planted to forest, sambar habitat can be expected to increase. Since the two processes are going on simultaneously, this involves local shifting from scrub areas to exotic forest areas for cover. Unless serious efforts are made to eliminate

these animals from the entire area, the sambar should survive further stages of land reclamation.

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## The Hedgehog Population and Invertebrate Fauna of the West Coast Sand Dunes

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It is convenient to divide the sand dunes into three zones, characterized by their vegetation, and the invertebrate fauna, which largely depends on the plants for cover and food, can also be divided into these three zones.

The first of these zones nearest the sea is the belt characterized by a sparse covering of marram grass, beach silver grass or pingao. These plants provide very little cover or insulation and produce no litter; as a result the surface temperature of the sand may fluctuate violently throughout the day. During mid-summer it may range from 120° F. to 60° F., but despite this some animals are found here, the most frequently occurring ones being burrowing centipedes and ants, digging wasps (*Salius* spp.), tiger beetles (*Cicindella* spp.) and their larvae. An important element of this zone is the occasional piece of driftwood or seaweed which gives cover to sandhoppers (*Talorchestia* spp.), the littoral earwig (*Anisolabus littoralis*), slaters, termites, the katipo (*Latro-*

*dectus katipo*), the large caterpillars of the sand scarab (*Pericoptus truncatus*), as well as many species of mosquitoes, sand flies and the kelp fly (*Coelopa littoralis*). These invertebrates attract pipits, plovers, sparrows, chaffinches and other birds by day and hedgehogs at night. Slim grass spiders build their webs in the beach grasses and take advantage of the many small dipterans blown in from the foreshore.

The more consolidated sand dunes forming the second zone may have a light covering of marram, lupin and sedges or an impenetrable tangle of lupins and bracken overgrown with tall grasses, *Muehlenbeckia*, and goose grass. This dense cover produces an abundance of litter which provides cover and moisture for the rich invertebrate fauna. The varied texture of the sand and soils, the presence of pines, *Coprosma*, boxthorns, toi-tois, flax and other shrubs, and great extremes of moisture and temperature, make this a rich habitat for invertebrates. The leaves, flowers, roots, seeds