

Daily Activity Pattern of Blackbuck, Antilope cervicapra L. of Tal Chhapar Wildlife Sanctuary, Rajasthan and its Seasonal Variation

Abstract

The daily activity pattern of blackbuck Antilope cervicapra L. was studied in the Tal Chhapar wildlife sanctuary for a year. Tal Chhapar wildlife sanctuary is situated in Sujangarh tehsil of district Churu of Rajasthan state. The major activities namely grazing, walking, standing/ scanning and lying of blackbuck were studied within the daily and seasonal time frame in the sanctuary. Existence of a basic activity pattern has been established with diurnal, monthly and seasonal variation. Pasture and climatic conditions appear to be the major factors influencing the pattern.

Keywords: blackbuck, activity pattern, daily, monthly and seasonal variation.

Introduction

India has a rich heritage of wildlife as well as long history and tradition of conservation. The love and regard for wildlife is a part of Indian culture and yet it is confronted with the sad paradox of wildlife in India fast disappearing. The blackbuck, which was found in thousands barely 50 years back, is now confined to small pockets surviving under the strictest protection.

Unlike Africa, India is not a country of antelopes. There are only a few species of antelopes to be found in the sub-continent. The blackbuck (Antilope cervicapra) is a major component of the semi-arid grassland ecosystem of the plains of the Indian sub-continent (Ranjitsinh, 1989; Chauhan and Sawarkar, 1989; Prakash, 1990 and Manakadan and Rahmani, 1998). In Rajasthan, this species is not present in very arid areas where surface water is not available for the greater part of the year. Ranjitsinh (1982) pointed out that, blackbuck's dependence on grazing and its preference for green fodder has restricted its distribution in Rajasthan, to areas that are close to cultivation or which have better pastures.

Tal Chhapar wildlife sanctuary is situated in Tal Chhapar town, tehsil Sujangarh of district Churu. It is 11 kms. away from Sujangarh, 60 kms. from Churu and 215 kms from Jaipur. The rulers of former Bikaner state established this sanctuary as a hunting ground in 1905. In the 1920s, Maharaja Ganga Singh had introduced blackbuck at Tal Chhapar. Maharaja Karni Singh handed over the area to the Government of Rajasthan in 1962. The present area of the sanctuary is 700 hectares. There are four water ponds (Dungolao, Bhainsolao, Ganga Singh and Salim Ali) inside the sanctuary and one pond (Gandhi Sarovar) outside its boundary.

The present paper is a part of the investigation and deals with the major activities of the antelope within the diurnal and seasonal time-frame. Diurnal activity pattern of blackbuck have been studied by Chhattopadhyay and Bhattacharya, 1983 at Ballavpur wildlife sanctuary; in the Rajasthan desert (Bohra et al.1992); Sinha and Chhabra (1985) in Gujrat and Kumar (1993) in Gajner.

Method of Study

The activity patterns of the blackbuck were broadly classified following Jarman and Jarman (1973) into four categories namely: grazing, walking, standing/ scanning and lying. In this study, activity refers to any action which resulted into a change in the position of the creature in relation to space. An animal was considered static while standing or scanning and while lying down, otherwise it was considered mobile. Main mobile activities were grazing and walking. Walking in this account refers to



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the movement resulting into a change in location and include running, trotting etc. standing/ scanning activity was qualified as the animals observed standing idly with occasional scanning. Scanning refers to searching, looking for or at object in a standing posture. Only these major activities were studied for establishing daily activity pattern and its seasonal variations.

Routine observations were made by walking along the laid gridlines. Whenever a group or individual animal came into the sight the observational information were recorded in the data sheet. A safe distance of about 100 metre was found to be adequate for observing the animals. Observations were made using a10X40 binoculars. A systematic regular observation schedule between Jan.2001 to Dec.2001 was followed. The daily observation schedule was divided into three shifts: morning shift 06.00 – 10.00 hrs, noon shift 10.00 -14.00 hrs and afternoon shift 14.00-18.00 hrs. Once in month a continuous 12 hourly (06.00-18.00 hrs) was undertaken. The hour-wise analysis of the activities during the daytime is represented here as the mean of the percentage of the total number of animals observed during the different hours of the day, during the entire study period.

Results

Total Activity

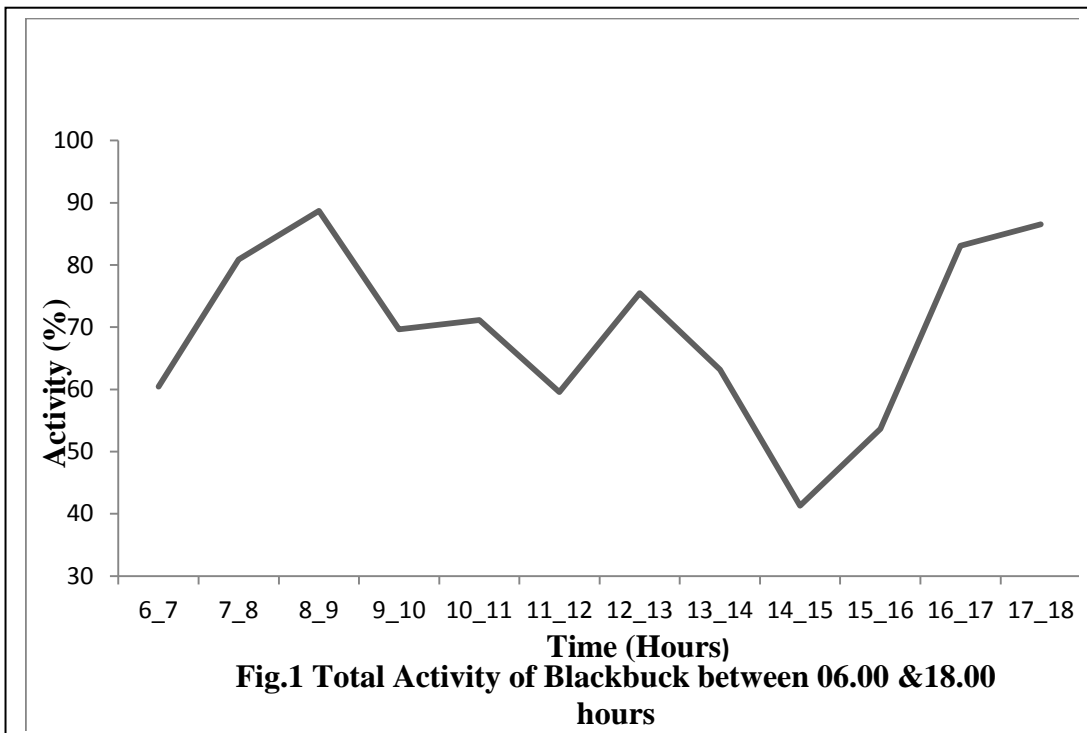
The total daily activity cycle of the blackbuck is shown in Fig.1. The animal mostly remained active in the daytime except around early afternoon when less than 50 % of the population was seen to be active. The activities of blackbucks reached their peaks in the morning at 8.00-9.00 hr, in noon at

activity started declining from 13.00 hr and was lowest at 14.00-15.00 hr

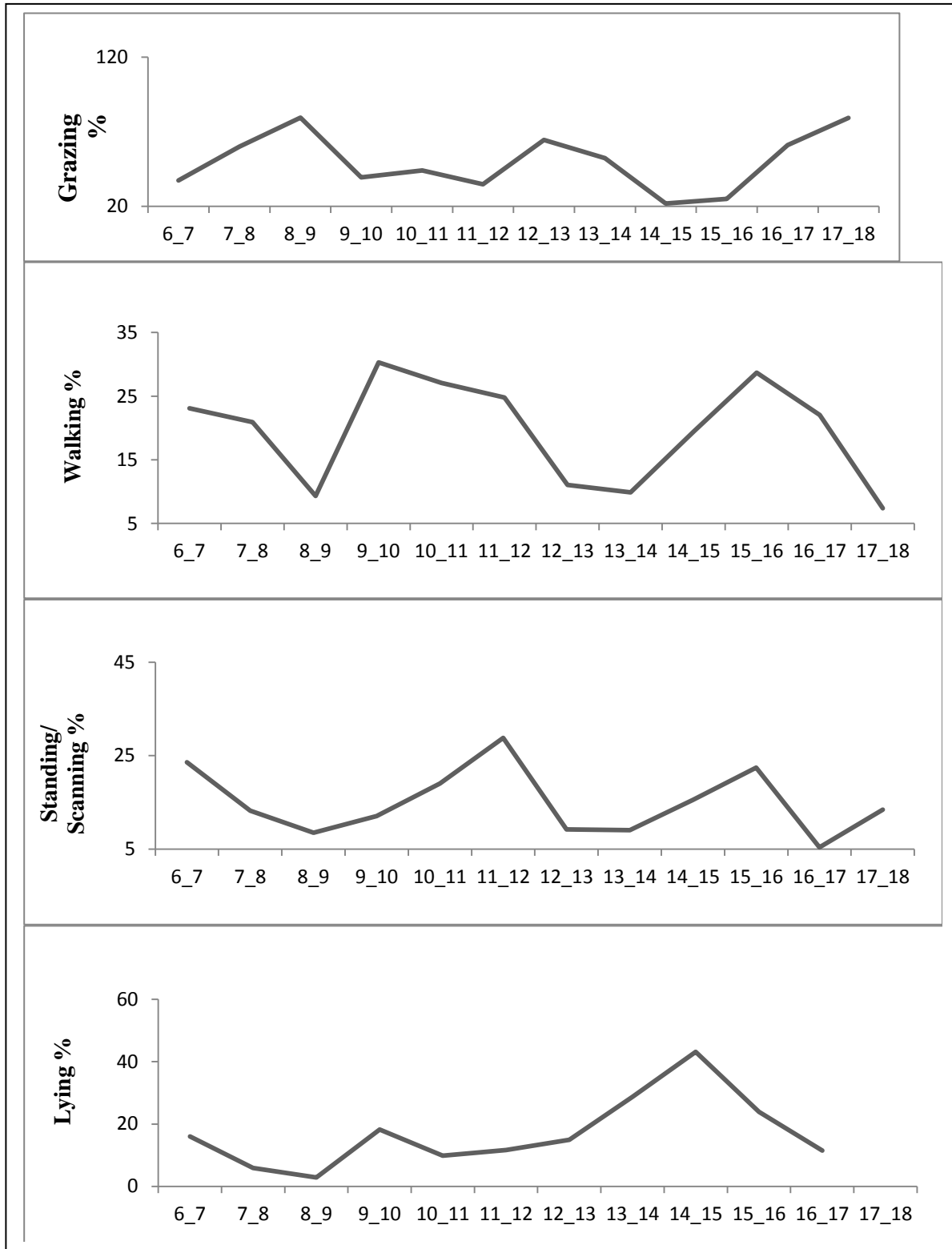
Daily Activity

An analysis of the various major activities (Fig. 2) revealed that grazing followed the general pattern of daily activity, peak period of grazing corresponding with the decline in walking, standing/scanning or lying. On the other hand walking, standing/scanning or lying compensated hours of low grazing.

Daily activity of blackbuck started at an average of 5.50 AM in the morning and ceased before or around sunset. The peak periods of grazing were 8.00-9.00 hr, 12.00-13.00 hr and 17.00-18.00 hr when approximately 65 % of the animals were grazing. Walking activity was maximum during 9.00-10.00 hr; 11.00-12.00 hr and 15.00-16.00 hr when around 25 % of the blackbucks were mobile. 6.00-7.00, 11.00-12.00 and 15.00-16.00 hrs were the time of the day when standing or scanning activity of blackbuck was more than 20 %. The maximum lying or sitting activity of blackbuck was at 14.00-15.00 hr and during the hours of 13.00-14.00 and 15.00-16.00 lying was more than 23%.



12.00-13.00 hr and in the evening at 17.00-18.00 hr when more than 75 % of the animals were active. Total



Time (Hours)
Fig.2.Blackbuck Activity: Hourwise analysis between 06.00 and 18.00 Hours

Annual Activity

The monthly variation and annual pattern of grazing, walking, standing/scanning and lying activities are shown in Fig.3.

Grazing activity of blackbuck was observed to be below 50 % during the months of January and February but it increased to 52.14 % in the month of March. From March onwards a decline in grazing was seen till June when only 36.30 % of blackbucks were seen grazing. With

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the onset of rains in July rise in the grazing activity was observed till December when 61.97 % of the total animals were grazing.

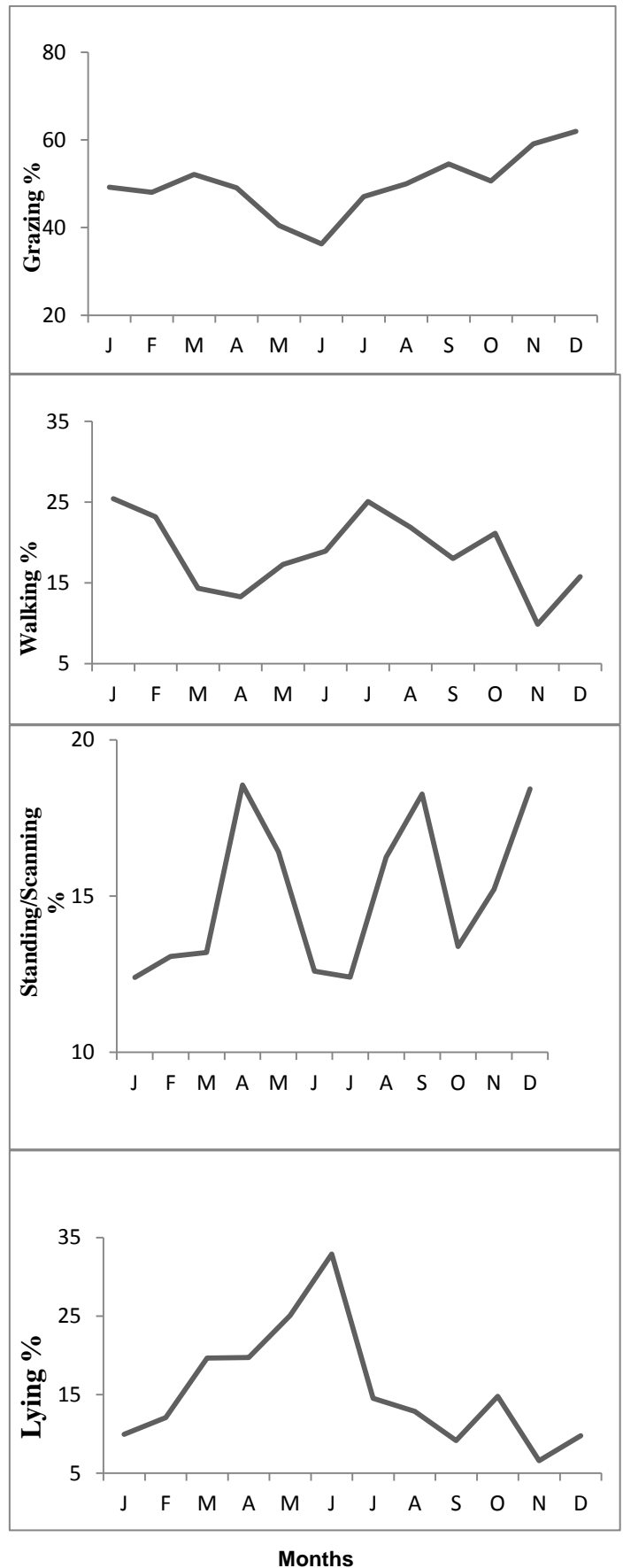
As far as walking activity including running is concerned, it was found to be quite common in the months of January, February, July, August and October, when more than 20 % of the total population of blackbuck were seen to be engaged in doing so. The maximum frequency of walking activity was encountered in January (25.43 %) while it was lowest in the month of November (9.90 %).

An increase in standing and scanning activity of blackbuck was observed from January (12.40 %) to April (18.56 %). From April onwards standing/scanning activity declined till July when it was 12.41 %. This activity increased in the months of August (16.24 %), September (18.27 %) and December (18.43 %) with a fall in the months of October (13.39 %) and November (15.52 %).

Lying activity showed just the reverse relation with grazing in annual pattern. This activity was at its peak in June when 32.91 % of total blackbucks were observed to be lying or sitting. A rise in lying activity was observed from October (14.81 %) onwards till June and thereafter it decreased till September (9.16 %).

Seasonal Activity

The seasonal variations of different major activities are shown in Table 1. Maximum grazing activity of blackbuck was observed during the winter (Nov-Feb) season (54.58 %), which declined in the rainy (July-Oct) season (50.58 %) and was lowest in the summer (March-June) season (44.50 %). Walking activity was maximum during rainy season (21.52 %) and minimum in the summer season (15.95 %). Standing and scanning activities showed lesser



Months
Fig.3. Blackbuck Activity Budget: Monthwise analysis

Table 1. Seasonal variation in Grazing, Standing, Walking & Lying Activities of Blackbuck

| Seasons | Grazing % | Standing/Scanning % | Walking % | Lying % |
|---------|-----------|---------------------|-----------|---------|
| Summer | 44.50 | 15.19 | 15.95 | 24.35 |
| Rainy | 50.58 | 15.07 | 21.52 | 12.85 |
| Winter | 54.58 | 14.76 | 21.05 | 9.59 |

variation being 15.19 % in summer (Maximum), 15.07 % in rainy and 14.76 % in winter. Lying activity showed a negative correlation with grazing activity-maximum (24.35 %) in summer and minimum (9.59 %) in winter season.

Discussion

Blackbucks perform a number of major activities during the daytime. These activities are grazing, movement (walking) for various purposes such as towards drinking site, searching better feeding areas etc., standing, scanning, sitting and resting.

In the diurnal activity pattern observed at Tal Chhapar grazing and walking showed alternative bouts with roughly proportional intensities. Whenever the frequency of grazing for a particular hour dropped, that of walking increased suggesting a good coordination among these two activities where walking is a function of grazing or vice versa. This functional relationship reflected the mobile-grazer character of the species. Such mobile-grazer character of this species in open land has also been reported by Prater (1965), Schaller (1967), Roberts (1977) and Chattopadhyay and Bhattacharya (1983).

Grazing is the dominant activity of blackbuck observed during the present study. The animal spends 49.88 % of its total activity in grazing during the daytime. The dominance of the grazing activity throughout the daytime has also been reported by Schaller (1967), Krishnan (1972) and Roberts (1977). Perhaps the extensive feeding of this mobile-grazer species during daytime is facilitated by the daylight in selecting grass and keeping it alert against intruders.

Seasonal variation in these activities was observed in the present study. Grazing and walking activities were minimum during summer. This was due to high temperature and scarcity of food in and around the sanctuary area. Rise in grazing activity during March was due to availability of dry pods of *Prosopis juliflora* and *Acacia nilotica* at that time. However, in the rainy season with the new flush of green vegetation, the animal's grazing activity reached its peak. Rainy season is the time of rutting in males and different social interactions reached their peaks by that time, resulting in high frequency of walking during that period. Grazing activity increased further

during winter. Similar observations were made by Nair (1977), Chattopadhyay and Bhattacharya (1983) and Kumar (1993).

Two grazing peaks during summer-one in the morning and other in the evening were observed at Tal Chhapar Sanctuary. However, during rainy and winter seasons in addition to these two morning and evening peaks, a third peak of grazing activity was observed at noon. Artificial feed was provided by the Forest Department in the morning and evening. Non availability of vegetation and high temperature in the sanctuary might be the reason for the absence of noon grazing peak during summer as compared to rainy and winter seasons. Ranjitsinh (1982), Chattopadhyay and Bhattacharya (1983), Sinha and Chhabra (1985), Bohra et al. (1992) and Kumar (1993) have described morning and evening as two peaks of grazing activity. Nair (1975) has reported four peaks of grazing activity at Point Calimere. He observed two noon peaks besides morning and evening peaks.

The number of antelopes observed lying and standing /scanning were high throughout the summer, the common function of these two types of activities were occasional rumination besides watching, taking rest or sleep while in lying posture. The standing/scanning and lying activities drop remarkably from monsoon to winter. The high value of these activities in summer was due to the thermal reaction of the animals and perhaps its occupation with rumination. Balch (1955) has referred that ruminants rarely sleep because of the need to keep the thorax upright while ruminating. However the rumination will also take longer time during summer due to high content of fibres in the available food. Morag (1967) has suggested that in sheep, rumination replaces sleep, when they are fed with high fibre containing food. In blackbuck the inactive portion of the small intestine is relatively larger and the reticulum of the stomach is comparatively inefficient. To overcome these inefficiencies a fine grinding of food is required (Gill and Korda, 1960). This is achieved by prolonged chewing of the cud.

Thus it seems that there is a definite pattern as far as the major activities are concerned in the fixed hours of the day, which are subjected to seasonal variations. The availability of pasture and atmospheric temperature seem to be the strongest ecological determinants in the seasonal variation of the basic type. Grazing and walking and grazing and lying correspond with the seasonal variation in pasture quality. However with the declined pasture quality an increase in walking activity may be expected but the high temperature in the summer acts as a limiting factor for mobile activities. Similar observations have been made by Krishnan (1972) and Chattopadhyay and Bhattacharya (1983).

The diurnal activity pattern during summer can be divided into two distinct phases, one corresponding with low sun elevation i.e. morning and afternoon and the other with high sun elevation i.e. from late morning to late noon. Along with the seasonal pasture quality and atmospheric

temperature, the sun elevation in daytime also acts as an important factor. This is explained by the high mobile activities during morning and afternoon hours and diminishing late morning and late noon activities during summer. Similar results were observed by Chattopadhyay and Bhattacharya (1983).

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