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NOTES ON BIRDS FROM THE LLANOS OF META, COLOMBIA

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The llanos of Colombia are a distinctive savanna habitat extending east from the Andes roughly between 3° and 7° lat N to Venezuela in the lowlands between 200 and 600 m above sea level. These llanos are characterized by a pronounced dry season, typically from December through March with the remainder of the year wet with the higest rainfall in July (Bates, 1948). During the wet season much of the llanos is flooded, while by the end of the dry season open water is confined to rivers and a few lakes. The vegetation of the Colombian llanos is described by Blydenstein (1967).

Historically the llanos have played a significant role in the evolution and distribution of the South American avifauna. Dry and wet phases of the Pleistocene caused the expansion and recession of the llanos and related savanna habitats (van der Hammen, 1974). These changes played a driving force in the speciation of birds (Haffer, 1974) by creating forest refugia surrounded by dry savanna which isolated populations of forest birds. For species which inhabited the savannas during this period, the expansion of the savannas during dry periods allowed emigration and mixing with different savanna faunas, including that of North America (Webb, 1978).

In light of the role the llanos have played in shaping the neotropical avifauna it is worthwhile to document those species which are now found on the llanos. However, the avifauna of the llanos has not been adequately studied. Most of what is written on the birds of this region is contained within large, comprehensive works (Phelps and Phelps, 1950, 1958, 1963; Chapman, 1917; Meyer de Schauensee, 1966; Hilty and Brown, 1985). In Meta most collectors have concentrated on the Sierra de Macarena (Blake, 1962; Olivares, 1962; Lemke and Gertler, 1978) while the llanos remain largely neglected. McKay began a study of the birds of the llanos of Meta but unfortunately he died before completing his study, one brief paper was published posthumously (McKay, 1980). This paper adds many species to his list and provides further data on breeding and molt.

This report is based on specimens and observations made at the Stroud ranch in Meta, Colombia. The ranch lies 17 km southeast of Puerto Lopez at 200 m above sea level, long. 4° 05'N, lat. 72°58'W.

This paper incorporates observations made by John Smith and Susan T. Smith 26 June - 9 July 1969; F.B. Gill, F. Joseph Stokes and C. Stokes 16 February - 2 March 1970; Charles D. Fisher 18 December 1971 - 6 January 1972, and 14 July - 2 August 1973. All specimens collected are now deposited in the collections of the Academy of Natural Sciences in Philadelphia.

The ranch lies adjacent to a large, permanent oxbow lake. Most of the surrounding lands are used for cattle pasturage. These grasslands are periodically flooded during the wet season. Along the edge of the lake is a patch of deciduous forest which is mostly flooded during the wet season, though a portion remains above peak flood levels.

The Appendix is a list of 231 species recorded by the above observers on the ranch.

SPECIMENS DOCUMENTING RANGE EXTENSIONS

Ten species recorded at the ranch were not previously known from Meta or eastern Colombia (Meyer de Schauensee, 1949, 1950, 1951, 1966; Dugand and Phelps, 1946; Olivares, 1962; McKay, 1980). Of these, two represent the second record for Colombia, one represents a new race for Colombia, and seven represent substantial range extensions and first records for Meta.

Band-tailed Nighthawk, *Nyctiprogne leucopyga exigua*. - Previously this species was only known for Colombia in the extreme east at Maipures, Vichada. Gill and Fisher collected four; ANSP 170287, 170467, 170468, 170469.

Pale-bellied Hermit, *Phaethornis anthophilus anthophilus*. - A female collected in December, 1971 by Fisher; ANSP 170478 represents a first record for east of the eastern Andes south of the Zulia valley. Meyer de Schauensee (1949) speculated that *P.a. fuliginosus* Simon 1901, known only from a single trade skin without locality data, would be found east of the eastern Andes. Our specimen is a typical *P.a. anthophilus*. Berlioz and Jouanin (1944) thought Simon's type represents an aberrant individual. *P.a. fuliginosus* should be considered a synonym of *P.a. anthophilus* (C. Jouanin *in litt.*).

Rusty-backed Spinetail, *Cranioleuca vulpina alopecias*. - Previously known in Colombia only in eastern Vichada at Maipures. Fisher collected four; ANSP 170479, 170480, 173507, 173508. Several others were seen and netted on the ranch. Furniss (ms) recorded this species at Carimagua, Meta.

Bearded Tachuri, *Polystictus pectoralis brevipennis*. - Previously known in Colombia only by the race *bogotensis* of limited distribution in the temperate zone at Pavas, Suba and upper Dagua Valley. Three were collected by Gill and Fisher, ANSP 170298, 170505, 170299. Also found by Furniss (ms) at

Carimagua, Meta. The closest records of this race are from Apure and Barinas, Venezuela.

Yellow Tyrannulet, *Capsiempis flaveola cerulus*. - Previously recorded east of the Andes in Vichada, and Vaupés. Fisher collected two, ANSP 170503, 170504. Furniss (ms) reported this race from Carimagua, Meta. Niceforo and Olivares (1976) reported *Capsiempis flaveola* subsp. from Villavicencio.

Rufous-tailed Tyrant, *Knipolegus poecilocercus*. - Romera-Zambrano (1977) reported the first specimen of this species for Colombia, collected in Vichada. Fisher collected seven, ANSP 170497, 170498, 170508, 170509, 173520, 173521, 173522. This species was fairly common at the ranch.

Stripe-necked Tody-Tyrant, *Hemitriccus striaticollis striaticollis*. - Hilty and Brown (ms 1986) report only three specimens from Colombia. Gill and Fisher collected two, ANSP 170289, 170501. The closest previous record to Meta is from northeast Perú, Departamento de San Martín, Moyobamba.

Fuscous Flycatcher, *Cnemotriccus fuscatus cabanisi*. - Previously the race *cabanisi* was only known from Caribbean Colombia. Traylor identified specimens collected by Furniss (ms) at Carimagua as *cabanisi* also. A specimen from Vaupés was identified as *C. f. duidae* by Romero-Zambrano (1977), who also identified (1978) three specimens from Puerto Narino, Amazonas as *fuscatior*. Fisher collected three, ANSP 170496, 173524, 173525. These specimens are closer to *cabanisi*. Additional specimens should be obtained from the region between northern Colombia *cabanisi* and northeastern Peru *fuscatior* in order to ascertain the limits and validity of these subspecies.

Yellow-bellied Dacnis, *Dacnis flaviventer*. - In Colombia this species has been recorded only in Vaupés, Amazonas and Caqueta. Fisher collected one, ANSP 170523.

Orange-crowned Oriole, *Icterus auricapillus*. - Previously recorded only in northern Colombia south to Arauca. Fisher collected four, ANSP 170521, 170522, 173533, 173534.

Additional records lacking specimen verification:

Sharp-tailed Ibis, *Cercibis oxycerca*. - Gill reported as numerous around the lake during his visit. In Colombia known on the llanos along the rios Casanare, Cravo Norte, and Arauca. Brown and Hilty (1986) report in Vichada, Furniss (ms) reports at Carimagua, Meta.

Common Ground-dove, *Columbina passerina*. - Several netted by Gill. Known east of the Andes in Colombia in Norte de Santander and Vaupés.

SEASONAL ACTIVITY

The seasonal variation in rainfall of tropical savannas profoundly affects movements of birds and timing of molting and breeding schedules (Bourlière and Handley, 1970; Mader, 1981). These inter-relationships have not been adequately documented. The following information will hopefully contribute to a stronger understanding of the relationships between seasonal rainfall and seasonal activities such as molting, breeding, and migrations.

During the wet season much of the llanos is flooded providing suitable habitat for many aquatic species. However, during the dry season available habitat is greatly reduced for these species. Oxbow lakes such as the one on the ranch provide a valuable refuge for these species during the dry season (Pinowski *et al.*, 1980). The following are species which were present on the lake during the dry season and either absent or much reduced in numbers during the wet season.

Egretta thula
Egretta caerulea
Nycticorax nycticorax
Botaurus pinnatus
Cercibis oxycerca
Phimosus infuscatus
Eudocimus ruber
Eudocimus albus
Ajaia ajaja
Dendrocygna viduata
Dendrocygna autumnalis
Hoploxypterus cayanus
Himantopus himantopus
Sterna superciliaris
Phaetusa simplex
Gallinago gallinago
Rynchops nigra

The lake also supports substantial numbers of North American migrant and transient species. The following are the North American migrants seen at the ranch. All but the last five are largely dependent on the lake for suitable foraging habitat during the dry season.

Anas discors
Pandion haliaetus
Tryngites subruficollis
Actitis macularia
Tringa flavipes
Tringa solitaria
Tringa melanoleuca
Calidris minutilla
Calidris melanotos
Tyrannus tyrannus
Hirundo rustica
Dendroica striata
Dendroica petechia
Seiurus novaboracensis

Data on breeding activity was collected by all who visited the ranch. A total of 278 specimens were examined for evidence of breeding activity (gonad condition, brood patch). Though gonad condition may not be an accurate indicator for precise time of breeding (Snow and Snow, 1964) it is here considered suitable for discerning breeding in the dry vs. wet season. There were an additional 29 sight records of breeding activity (active nests or recently fledged young). Admittedly the small number of specimens precludes firm conclusions on the timing of breeding, however due to the relative paucity of

data on breeding for the birds of this region these data are presented.

Twenty-nine species exhibited evidence of breeding activity during the two wet season sessions (6 June - 9 July 1969 and 14 July - 2 August 1973). These are listed below:

Anhima cornuta
Milvago chimachima
Columbina talpacoti
Claravis pretiosa
Leptotila rufaxilla
Glaucis hirsuta
Chloroceryle americana
Sakesphorus canadensis
Thamnophilus doliatus
Myrmeciza longipes
Fluvicola pica
Fluvicola leucocephala
Pitangus sulphuratus
Pitangus lictor
Elaenia flavogaster
Thryothorus leucotis
Turdus nudigenis
Donacobius atricapillus
Coereba flaveola
Thraupis episcopus
Ramphocelus carbo
Euphonia laniirostris
Cacicus cela
Icterus auricapillus
Saltator maximus
Saltator coerulescens
Paroaria gularis
Sporophila intermedia
Sporophila minuta

Twelve species showed breeding activity during the two dry season sessions (16 February - 2 March 1970 and 18 December 1971 - 6 January 1972).

Jacana jacana
Charadrius collaris
Columba cayennensis
Podager nacunda
Nyctiprogne leucopyga
Amazilia fimbriata
Brachygalba lugubris
Camptostoma obsoletum
Phaeomyias murina
Myiarchus ferox
Myiozetetes cayannensis
Troglodytes aedon

Nine species showed breeding activities in both the wet and dry seasons.

Columbia minuta
Piaya minuta
Nyctidromus albicollis
Xiphorhynchus picus
Cranioleuca vulpina
Thraupis palmarum
Oryzoborus angolensis
Arremonops conirostris
Sicalis flaveola

Data on molt were recorded from the same 278 specimens used above. Precise determination of timing of molt requires several examinations of marked individuals or a large series of specimens. From the small samples available here it is not possible to draw firm conclusions regarding the cycle of molt in any particular species, but co-incident molting and breeding activity can be discerned. These energy and nutrient demanding activities are usually segregated temporally.

Overlap in breeding and molt has been discussed in tropical birds by Foster

(1974, 1975) and in African birds by Payne (1969) though it is not a common occurrence. The following species showed some overlap in molt and breeding condition and supplement the examples given by Foster and Payne. The data are taken directly from Fisher's catalogs. For all the individuals listed below permanent specimens were not prepared. Of these only two were collected in the dry season; *Thamnophilus doliatus* and *Camptostoma obsoletum*. This is not surprising due to the shortness of the dry season, because most species nest during the wet season and the presumed greater availability of food for most species during the wet season.

Columbina talpacoti. Male testes 10 x 5 mm, plumage new; moderate molt on flanks, 21 July 1973. Male testes 9 x 5 mm, plumage new; finishing heavy body molt, 21 July 1973.

Leptotila rufaxilla. Female oviduct slightly enlarged, plumage mostly new; few old secondaries, heavy body molt, 18 July 1973. Male testes 13 x 7 mm, plumage very new; moderate-heavy molt on flanks and rump, 17 July 1973.

Forpus conspicillatus. Male testes 5 x 4 mm, slightly enlarged; plumage very new; remige molt just completing, slight body molt, 23 July 1973. Female non-breeding; duct very slightly enlarged, plumage as in male, 23 July 1973.

Piaya minuta. Female ovary greatly enlarged; follicle 3.5 mm yolk, plumage mostly new, moderate crown molt, few old remiges, 18 July 1973.

Myrmeciza longipes. Male testes 6 x 4 mm, just finishing molt, 17 July 1973. Female ovary greatly enlarged, follicle 3 mm; plumage new, slight molt, 17 July 1973. Female ovary and oviduct moderately enlarged, follicle 3mm yolk; plumage moderate-heavy wear, remige and rectrix molt one fourth complete, heavy body molt, 23 July 1973.

Thamnophilus doliatus. A pair with a juvenile, each with fresh plumage; slight body molt and moderate body molt, 26 Dec. 1971.

Camptostoma obsoletum. Male testes 6 x 4 mm; plumage worn, fairly heavy body, rectrix, and remige molt, 4 January 1972.

Elaenia flavogaster. Male testes 7 x 4 mm, plumage heavily worn, heavy body molt, 29 July 1973. (A female collected at the same time with similar molt but non-breeding).

Pitangus lictor. Female ovary and oviduct moderately enlarged, follicle 3mm yolk; fairly heavy body molt, 19 July 1973. (a male and female collected at the same time in breeding condition but not molting).

Thryothrorus leucotis. Male testes 6 x 4 mm, plumage new, remige molt just finishing, 17 July 1973. (Three collected at the same time; 1 female in final stage of molt and non-breeding, 2 males finished with molt and in breeding condition).

Turdus nudigenis. Male testes 15 x 10 mm; body plumage heavily worn with no molt; remiges and rectrices half old and half new, 18 July 1973. (Molt interrupted for breeding?).

Saltator caerulescens. Male testes 10 x 7 mm; remiges and rectrices new, heavy body molt, 18 July 1973.

Thraupis episcopus. Male testes 11 x 6 mm; heavy body molt throughout, 16 July 1973. Female ovary and oviduct very slightly enlarged, brood patch; moderate molt on breast, back, and wings, 16 July 1973.

Ramphocelus carbo. Male testes 9 x 6 mm; fairly heavy body molt, remiges and rectrices molt half complete, 22 July 1973. (Another taken at the same time with similar molt but not in breeding condition.).

For no species was a large series examined, however indications suggest that *Leptotila rufaxilla*, *Forpus conspicillatus*, *Elaenia flavogaster*, *Thryothorus leucotis*, and *Thraupis episcopus* males tend to show more overlap in molt and breeding condition than females. This may be a result of the tendency for males to enter breeding condition earlier and remain in breeding condition longer than females (Snow and Snow, 1964). Also, the nutrient demands of egg production may require that females segregate molting and breeding more completely. In a few species the interruption of molt for breeding has been reported (Foster, 1975; Payne, 1969). In this collection one *Turdus nudigenis* appeared to have interrupted molt for breeding. Overall, the broad majority of birds examined supported the general rule that molt and breeding do not overlap.

Though great strides have been made in recent years to expand our knowledge of neotropical birds, many gaps in our knowledge persist. Large expanses of land remain unvisited by ornithologists and regions which have been studied often reveal more questions than are answered. Many facinating problems in evolutionary biology can be addressed through studies of neotropical birds. The potential is tremendous.

Unfortunately the face of South America is being rapidly and tragically altered by rampant human population expansion. It is incumbent upon contemporary tropical biologists to gather and preserve as much data as possible before human disruption further modifies natural systems. This paper presents information on the distribution of the poorly known llanos avifauna. Additional information on seasonal movements, breeding, and molt-breeding overlap are presented. This information contributes to filling a large gap in our knowledge of South American birds.

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SUMMARY

This paper lists 231 bird species found in the llanos near Puerto Lopez, Meta, Colombia. The list includes ten species which had not been previously reported in the llanos of eastern Colombia: *Nyctiprogne leucopyga exigua, Phaethornis a. anthophilus, Cranioleuca vulpina alopecias, Polystictus pectoralis brevipennis, Capsiempis flaveolus cerulus, Knipolegus poecilocercus, Hemitriccus s. striaticollis, Cnemotriccus fuscatus subsp. , Dacnis flaviventer, Icterus auricapillus.* Data on seasonal movements of birds, timing of breeding and molt/breeding overlap are presented.

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SAMENVATTING

Dit artikel geeft een opsomming van 231 vogelsoorten die werden aangetroffen in de llanos nabij Puerto Lopez, Meta, Colombia. In deze lijst komen tien soorten voor die nooit voorheen in de llanos van oostelijk Colombia werden gemeld: *Nyctiprogne leucopyga exigua, Phaethornis a. anthophilus, Cranioleuca vulpina alopecias, Polystictus pectoralis brevipennis, Capsiempis flaveolus cerulus, Knipolegus poecilocercus, Hemitriccus s. striaticollis, Cnemotriccus fuscatus* subsp., *Dacnis flaviventer, Icterus auricapillus.* Tevens worden gegevens naar voor gebracht betreffende seizoen verplaatsingen, timing van het broedseizoen en overlap tussen rui en broedseizoen.

RESUME

Cet article énumère les 231 espèces d'oiseaux trouvées dans les llanos près de Puerto Lopez, Meta (Colombie). La liste comprend dix espèces jusqu'à présent inconnues des llanos de Colombie orientale: *Nyctiprogne leucopyga exigua, Phaethornis a. anthophilus, Cranioleuca vulpina alopecias, Polystictus pectoralis brevipennis, Capsiempis flaveolus cerulus, Knipolegus poecilocercus, Hemitriccus s. striaticollis, Cnemotriccus fuscatus* subsp., *Dacnis flaviventer, Icterus auricapillus.* Sont également présentées des données sur les mouvements saisonniers, le déroulement de la reproduction et le recouvrement entre périodes de mue et de nidification.

APPENDIX

SPECIES RECORDED AT THE STROUD RANCH, META, COLOMBIA

An asterisk (*) indicates a specimen; two asterisks (**) indicates capture and examination but no specimen retained; no asterisk indicates a sight record.

Anhinga anhinga
Phalacrocorax olivaceus
Ardea cocoi
Butorides striatus
Egretta caerulea
Egretta ibis
Egretta albus
Egretta thula
Pilherodius pileatus
Nycticorax nycticorax
Cochlearius cochlearius
Botaurus pinnatus
Jabiru mycteria
Mycteria americana
Cercibus oxycerca
*Phimosus infuscatus**
Eudocimus ruber
Eudocimus albus
Mesembrinibus cayennensis
Ajaia ajaja
Anhima cornuta
Dendrocygna viduata
Dendrocygna autumnalis
Cairina moschata
Anas discors
Coragyps atratus
Cathartes aura
Cathartes burrovianus
Sarcoramphus papa
Elanus leucurus
Elanoides forficatus
Rostrhamus sociabilis
Ictinia plumbea
Buteo magnirostris
Buteo nitidus
Buteo albicaudatus
Busarellus nigricollis
Geranospiza caerulescens
Leucopternis schistacea
Heterospizias meridionalis
Circus buffoni
Falco peregrinus
Falco femoralis
Falco sparverius
Falco rufigularis
Colinus cristatus
Porzana flaviventer
Porphyrula flavirostris
Eurypyga helias
Jacana jacana
Vanellus chilensis
Hoploxypterus cayanus
Charadrius collaris
Tringa flavipes
Tringa solitaria
Tringa melanoleuca
Tryngites subruficollis
Actitis macularia
Calidris minutilla
Calidris melanotos
Gallinago gallinago
Gallinago undulata
Himantopus himantopus
Burhinus bistriatus
Phaetusa simplex
Sterna superciliaris
Rynchops nigra
Columba cayennensis
*Columbina minuta***
*Columbina passerina***
*Columbina talpacoti***
*Claravis pretiosa**
Zenaida auriculata
*Leptotila rufaxilla***
Scardafella squammata
Ara severa
Ara manilata
Aratinga leucophthalmus
Aratinga pertinax
*Forpus conspicillatus***
Brotogeris cyanoptera
Amazona ochrocephala

Pandion haliaetus
Herpetotheres cachinnans
Daptrius ater
Milvago chimachima
Polyborus plancus
Tapera naevia
Otus choliba
Speotyto cunicularia
*Chordeiles acutipennis**
*Podager nacunda**
*Caprimulgus maculicaudus**
*Nyctiprogne leucopyga**
*Nyctidromus albicollis**
Chaetura brachyura
Reinarda squamata
Streptoprocne zonaris
Glaucis hirsuta
*Phaethornis anthophilus**
*Polytmus guainumbi**
*Amazilia versicolor***
*Amazilia fimbriata**
*Trogon viridis***
Ceryle torquata
*Chloroceryle inda***
*Chloroceryle americana***
*Chloroceryle amazona***
*Chloroceryle aenea***
*Brachygalba lugubris**
*Momotus momota***
*Galbula tombacea***
*Bucco macrodactylus***
*Hypnelus ruficollis***
*Chelidoptera tenebrosa***
Crotophaga major
*Crotophaga ani***
*Piaya minuta***
Piaya cayana
Coccyzus melacoryphus
Pteroglossus inscriptus
Pteroglossus castanotis
Ramphastos vitellinus
*Picumnus squamalatus**
*Chrysoptilus punctigula***
Melanerpes cruentatus
Veniliornis passerinus
Phloeoceastes melanoleucos
*Xiphorhynchus picus**
Campylorhamphus procurvoides
Synallaxis gujanensis
*Cranioleuca vulpina**
*Taraba major**
*Sakesphorus canadensis**
*Thamnophilus doliatus**
*Thamnophilus nigrocinerus**
Amazonica amazonica
*Camptostoma obsoletum**
*Phaeomyias murina**
*Tyrannulus elatus**
*Elaenia chiriquensis**
*Elaenia flavirostris**
*Elaenia flavogaster**
*Polysticus pectoralis**
*Capsiempis flaveolus**
*Atalotriccus pilaris**
*Hemitriccus striaticollis**
Todirostrum sylvia
Todirostrum cinereum
*Tolmomyias flaviventris**
*Cnemotriccus fuscatus**
*Knipolegus poecilocercus**
Fluvicola leucocephala
*Fluvicola pica***
Myiarchus tuberculifer
*Myiarchus ferox**
Legatus leucophaius
*Pitangus lictor***
*Pitangus sulphuratus***
Megarhynchus pitangua
*Myiozetetes similis***
Machetornis rixosus
Empidonomus varius
*Tyrannus tyrannus***
*Tyrannus melancholicus***
*Pachyramphus polychopterus**
Tityra semifasciata
*Manacus manacus***
Hirundo rustica
Stelgidopterys ruficollis
*Tachycineta albiventer***
Phaeoprogne tapera
Progne chalybea
Anthus lutescens
*Troglodytes aedon***
*Thryothorus leucotis***
*Donacobius atricapillus***
Mimus gilvus
*Turdus leucomelas***
*Turdus nudigenis***

*Myrmotherula surinamensis**
*Cercomacra nigricans**
*Myrmoborus leucophrys**
*Myrmeciza longipes**
Sicalis flaveola
Emberizoides herbicola
Volatinia jacarina
Sporophila luctuosa
*Sporophila intermedia**
*Sporophila minuta***
*Oryzoborus angolensis***
*Arremon taciturnus***
*Arremonops conirsotris***
*Paroaria gularis**
*Saltator maximus***
*Saltator coerulescens***
*Schistochlamys melanopsis***
Tachyphonus rufus
*Ramphocelus carbo***
*Thraupis episcopus***
*Thraupis palmarum***
*Euphonia chrysopasta***
*Euphonia xanthogaster***
Euphonia laniirostris
*Tangara mexicana***
*Dacnis cayana***
*Dacnis flaviventer**
Tersina viridis
Dendroica striata
Dendroica petechia
Seiurus noveboracensis
*Geothlypis aequinoctialis***
*Coereba flaveola***

*Ammodramus aurifrons**
Cyclarhis gujanensis
Vireo olivaceus
*Hylophilus flavipes**
Psarocolius decumanus
Cacicus cela
Icterus nigrogularis
Icterus chrysocephalus
*Icterus auricapillus**
Gymnomystax mexicanus
Leistes militaris
Sturnella magna
Molothrus bonariensis
Scaphidura oryzivora
Cyanocorax violaceus

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