

THE BIOLOGY AND MANAGEMENT OF WILD RUMINANTS

CHAPTER FOUR

ACTIVITIES AND ACTIVITY PATTERNS

by

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CHAPTER 4. ACTIVITIES AND ACTIVITY PATTERNS

Wild ruminant activities may be divided into several categories. One category includes the basic postures of bedding and standing; an animal is either "up or down." Another category includes activities involving locomotion, such as walking, running, jumping, and climbing. Foraging and rumination are a third and very important category as free-ranging wild ruminants are responsible for their own feeding regime. Maintenance activities include such things as grooming, urinating and defecation. Social activities such as playing, fighting, and other activities may be considered as a fifth category.

Since animals are not gear-driven machines, there are gradients and combinations of the activities in these categories. Foraging, for example, involves both standing and walking. Standing often includes grooming, and at intervals during the day, urination and defecation. Playing and fighting involve locomotion, etc.

Routine participation in basic postures and locomotion are a major part of activity-time budgets. Activity patterns may be divided into two main groups--daily and seasonal. Predictable activity patterns over both 24-hour and 365-day periods are related to the light regime, including differences between light intensities through the day and changes in the length of daylight over seasons. Animals that are active during daylight hours are said to be diurnal, those active at night nocturnal, and those active at twilight crepuscular. Wild ruminants are often active at all these times, with differences between species and seasons of the year. It is important to recognize that length of daylight affects behavioral rhythms by causing changes in endocrine glands and hormone balances, linking the overall biochronology of a species to changes in environmental characteristics and range conditions through the year.

Activity-time budgets of wild ruminants often tend to be rather predictable, partly due to an historical environment that is genetically controlled, partly due to learned responses, and partly due to the physical environment, especially the light regime. Visual capabilities discussed in CHAPTER 3, UNIT 1.1, are genetically inherited, and are partial determinants of activity patterns as animals with large numbers of light-sensitive rods tend to be more nocturnal those with fewer rods and more cone cells. Learned responses also occur, however; groups that are disturbed more frequently during the day tend to become more active at night than groups living in more peaceful environs.

Time budgets over the annual cycle are important considerations, not only because of their interesting characteristics, but also because of their importance when evaluating seasonal rhythms in energy metabolism. Females, for example, charged with the responsibility of providing nutrients during the lactation period, spend more time foraging in the summer to meet the high cost of lactation than in the winter when metabolism is depressed.

Descriptions of activities and temporal activity patterns follow in TOPICS 1 and 2 respectively. WORKSHEETS for compiling activity budgets are included, and are used in PART III when estimating the metabolic costs of various activities.

REFERENCES, CHAPTER 4

ACTIVITIES AND ACTIVITY PATTERNS

BOOKS

TYPE	PUBL	CITY	PGES	ANIM	KEY WORDS-----	AUTHORS/EDITORS--	YEAR
aubo	dodo	nyny	1220	----	v 3, lives of game animals	seton,et	1929
aubo	prha	ecnj	171	----	behavio aspects of ecology	klopfer,ph	1962
aubo	olbo	edsc	653	----	animal dispersion, soc beh	wynne-edwards,vc	1962
edbo	jwis	nyny	349	----	maternal behavr in mammals	rheingold,hl	1963
edbo	acpr	nyny	159	----	natural hist of aggression	carthy,jd; ebling	1964
edbo	uchp	chil	307	----	soc behav, organiza, verte	etkin,w	1964
aubo	meth	loen	150	----	soci behav, animals, verte	tinbergen,n	1965
aubo	macm	nyny	118	----	integral animal behavior	davis,d	1966
aubo	jwis	nyny	432	----	patterns animl communities	elton,cs	1966
aubo	mhbc	nyny	534	----	anim behav: ethol, com psy	hinde,ra	1966
aubo	jwis	nyny	771	----	mechanisms of animal behav	marler,p; hamilto	1966
aubo	prha	ecnj	297	----	introdu to animal behavior	klopfer,ph; hailm	1967
aubo	hill	loen	760	----	the chemical senses	moncrieff,rw	1967
edbo	saco	phpa	563	----	abnormal behavr in animals	fox,mw	1968
edbo	botc	loen	647	----	the behav of domestic anim	hafez,ese	1969
edbo	apcc	nyny	412	----	comm, chem sig: advan chem	johnston,jw,jr; /	1970
aubo	uchp	chil	349	----	animal behavior	scott,jp	1972
aubo	whfr	sfca	458	----	wildlife ecology	moen,an	1973
edbo	acpr	nyny	344	----	mamm olfact, reprod, behav	doty,rl	1976
edbo	wiwi	bama	532	----	behavior of domestic anima	hafez,ese	1976
edbo	plpc	nyny	609	----	chemical signals, vertebra	muller-schwarze,/	1977
edbo	jwis	nyny	364	----	quantitative ethology	colgon,pw	1978
aubo	mhbc	nyny	452	----	comparative anim behavior	devisbury,da	1978
edbo	dohr	stpa	369	----	evolution of play behavior	muller-schwarze,d	1978
edbo	wiso	wadc	206	----	animal behavior	teague,rd,ed; moe	1979
aubo	oxup	loen	688	----	animal play behavior	fagen,rm	1981
aubo	fost	nyny	426	cerv	antelope, deer, north amer	caton,jd	1877
edbo	stac	hapa	668	od--	deer of north america	taylor,wp	1956
edbo	nhfg	conh	256	odvi	the white-tailed deer, n h	siegler,hr	1968
edbo	sfes	nate	130	odvi	w-t,southern forest habita	halls,lk	1969
aubo	ucap	beca	567	odhe	a herd of mule deer	linsdale,jm; tomi	1953
edbo	unbp	line	605	odhe	mule, black-tailed, no ame	wallmo,oc	1981
aubo	oxup	loen	215	ceel	herd, red dee, stud, behav	darling,ff	1937
aubo	ucap	beca	209	ceel	tule elk, hist, behav, eco	mccullough,dr	1971
aubo	cite	caen	74	ceel	ecology of red deer	mitchell,b; stai/	1977
edbo	wimi	wadc	ceel	ecology, mngmnt,n amer elk	thomas,jw; towel in pr	
aubo	uwyp	lawy	294	ceel	n amer elk: ecol,behav,mgt	boyce,ms; hayden-	1979
aubo	utop	toon	280	alal	north american moose	peterson,rl	1955

TYPE	PUBL	CITY	PGES	ANIM	KEY WORDS-----	AUTHORS/EDITORS--	YEAR
aubo	stac	hapa	238	anam	prngrhrn antlp & its mngmnt	einarsen,as	1948
aubo	stac	hapa	225	anam	hunting pronghorn antelope	popowski,b	1959
aubo	aakn	nyny	339	bibi	the time of the buffalo	mchugh,t	1972
aubo	uchp	chil	383	ovca	mount sheep: behavi, evolu	geist,v	1971
aubo	qupr	oton	166	obmo	muskoxen,biol,taxon,canada	tener,js	1965
edbo	iucn	mosw	940	many	behav & its relatn to mgmt	geist,v; walther,	1974
edbo	stac	hapa	494	many	big game, n amer, ecol,mgt	schmidt,jl; gilbe	1978
aubo	acpr	nyny	202	ungu	reproductive behavior, ung	fraser,af	1968

SERIALS

CODEN	VO-NU	BEPa	ENPA	ANIM	KEY WORDS-----	AUTHORS-----	YEAR
ZOBEA	12--2	219	250	cerv	ethologi obsrvatns, n amer	geist,v	1966

CODEN	VO-NU	BEPa	ENPA	ANIM	KEY WORDS-----	AUTHORS-----	YEAR
MDCBA	5----	1	64	odvi	w-tailed deer of minnesota	erickson,ab; gunv	1961
MDCRA	14---	1	80	odvi	michigan white-tailed deer	jenkins,dh; bartl	1959
RWLBA	6---2	153	325	odvi	w-t deer of the adirondcks	townsend,mt; smit	933
RWLBA	6---2	327	385	odvi	wntr, spr obsrv, adirndcks	spiker,cj	1933
WCDBA	14---	1	282	odvi	white-tailed deer, wiscons	dahlberg,bl; guet	1956

CODEN	VO-NU	BEPa	ENPA	ANIM	KEY WORDS-----	AUTHORS-----	YEAR
AZWBA	3----	1	109	odhe	in arizona chaparral	swank,wg	1958
CAFGA	26--2	139	166	odhe	calif deer, rcky mt mule d	mclean,dd	1940
CFGGA	8----	1	163	odhe	life hist, managemt, calif	taber,rd; dasmann	1958
CGFPA	4----	1	39	odhe	lit review, movmnts,captur	siglin,rj	1965
CGFPA	7----	1	26	odhe	literature review on behav	dorrance,mj	1967
JOMAA	37--2	143	164	odhe	behavior, populatn ecology	dasmann,rf; taber	1956

CODEN	VO-NU	BEP	ENPA	ANIM	KEY WORDS	AUTHORS	YEAR
UCPZA	88---	1	209	ceel	tule elk: hist, behav, eco	mccullough,dr	1969
WLMOA	16---	1	49	ceel	status, ecol, roosevel elk	harper,ja; harn/	1967
WLMOA	24---	1	66	ceel	the sun river elk herd	knight,rr	1970

CODEN	VO-NU	BEP	ENPA	ANIM	KEY WORDS	AUTHORS	YEAR
AMNAA	52--2	392	399	alal	observ in yellowstone park	mcmillan,jf	1954
BEHAA	20--3	377	416	alal	behavi in british columbia	geist,v	1963
FUNAA	8....	40	43	alal	moose habits and habitat	rush,wm	1946
JOMAA	39--1	128	139	alal	summr obsrvtns, behv,ontar	de vos,a	1958
MUZPA	25---	1	44	alal	the moose of isle royale	murie,a	1934
NCANA	101--	1	436	alal	ecol, proc inter sym, pt 1	bedard,j	1974
NCANA	101--	437	735	alal	ecol, proc inter sym, pt 2	bedard,j	1974
VLUBB	22-15	74	82	alal	[elk behav, leningr, russ]	timofeeva,ek	1967
ZOOLA	41-14	105	118	alal	ecol behav popula dynamics	denniston,rh	1956

CODEN	VO-NU	BEP	ENPA	ANIM	KEY WORDS	AUTHORS	YEAR
BPURD	2----	1	215	rata	ecol, caribou, prudhoe bay	white,rg; thomso/	1975
CWRSB	38---	1	71	rata	biology, kaminuriak popula	dauphine,tc,jr	1976
UABPA	3----	1	44	rata	behav of barren-ground car	pruitt,wo	1960
UABPA	8----	1	82	rata	ecology, managment, sweden	skunke,f	1969
WMBAA	10A--	1	79	rata	prelim investigation, pt 1	banfield,awf	1954
WMBAA	10B--	1	112	rata	prelim investigation, pt 2	banfield,awf	1954
WMBAA	12---	1	148	rata	caribou, continued studies	kelsall,jp	1957
WMBAA	15---	1	145	rata	barrn gr carib, coop study	kelsall,jp	1960

CODEN	VO-NU	BEP	ENPA	ANIM	KEY WORDS	AUTHORS	YEAR
AMNAA	43--2	257	354	anam	life hist, ecol, rng use, tex	buechner,hk	1947
CAFGA	30--4	221	241	anam	prong-hornd antlp in calif	mclean,dd	1944

anam continued on the next page

CODEN	VO-NU	BEP	ENPA	ANIM	KEY WORDS	AUTHORS	YEAR
CGFPA	3----	1	28	anam	litera revi on prong behav	prenzl原因,ej	1965
CGFPA	17----	1	16	anam	some behav patterns of the	prenzl原因,ej; gil/	1968
JOMAA	3----	82	105	anam	the prong-horn	skinner,mp	1922

CODEN	VO-NU	BEP	ENPA	ANIM	KEY WORDS	AUTHORS	YEAR
NPSMD	161--	1	161	bibi	bison, yellowston nat park	meagher,mm	1973

CODEN	VO-NU	BEP	ENPA	ANIM	KEY WORDS	AUTHORS	YEAR
AMNAA	24--3	505	580	ov--	distribut, variat, no amer	cowan,imct	1940
AZWBA	1----	1	153	ov--	desert bighorn	russo,jp	1956
WLMOA	4----	1	174	ov--	united sta, past to future	buechner,hk	1960

CODEN	VO-NU	BEP	ENPA	ANIM	KEY WORDS	AUTHORS	YEAR
AMNAA	56--2	297	324	ovca	ecology of mountain sheep	mccann,lj	1956
CAFNA	77--2	77	94	ovca	behavior of a bighorn herd	blood,da	1963
CJZOA	46--5	899	904	ovca	ovda,delay soc, phys matur	geist,v	1968
IGWBA	1----	1	154	ovca	stat, life hist, mgt, idah	smith,dr	1954
JOMAA	18--2	205	212	ovca	prelim study, yllwstn n pk	mills,hb	1937
JOMAA	20--4	440	455	ovca	bighorn sheep of texas	davis,wb; taylor,	1939
JOMAA	24--1	1	11	ovca	notes on life histor, colo	spencer,cc	1943
SCBUB	35--6	29	76	ovca	survey, sierra nevada high	jones,fl	1950
WGFBA	1----	1	127	ovca	wyoming bighorn study	honest,rf; frost,	1942
WLMOA	4----	1	174	ovca	bighorn sheep in the u s	buechner,hk	1960
XNFSA	6----	1	242	ovca	bighorn of death valley	welles,re; welles	1961

CODEN	VO-NU	BEP	ENPA	ANIM	KEY WORDS	AUTHORS	YEAR
XNFSA	5----	1	238	ovda	the wolves of mt mckinley	murie,a	1944

CODEN	VO-NU	BEP	ANIM	KEY WORDS	AUTHORS	YEAR
WMBAA	9----	1	34	obmo prelim stud,ellesmr is,nwt tener,js		1954

CODEN	VO-NU	BEP	ANIM	KEY WORDS	AUTHORS	YEAR
CAFNA	81--1	1	22	oram obsrvtns,kootenay nt pk,bc holroyd,jc		1967
CGFPA	8----	1	23	oram literature review, ecology hibbs,ld		1966
IGWBA	2----	1	142	oram life history, mgtmt, idaho brandborg,sm		1955

CODEN	VO-NU	BEP	ANIM	KEY WORDS	AUTHORS	YEAR
SCZFA	113--	660	668	caca [obs behav roe dee; germa] eiberle,k		1962
ZEJAA	8---2	61	81	caca behavior of roe bucks hennig,r		1962

CODEN	VO-NU	BEP	ANIM	KEY WORDS	AUTHORS	YEAR
MRLTA	41--3	34	40	dogo feral goats, british colum geist,v		1960

CODEN	VO-NU	BEP	ANIM	KEY WORDS	AUTHORS	YEAR
PZSLA	142-1	129	163	dosh study, feral pop, st kilda boyd,m; doney,jm/		1964

CODEN	VO-NU	BEP	ANIM	KEY WORDS	AUTHORS	YEAR
ZOGAA	33...	65	78	momo behav of moschus moschifer fradich,h		1966

CODEN	VO-NU	BEP	ANIM	KEY WORDS	AUTHORS	YEAR
JTBIA	2---1	63	68	---- environments of anim, plan browning,to		1962
QRBIA	22---	283	314	---- life tabs, natrl pop anim deevey,es		1947

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Proceedings of the Biennial Antelope States Workshop

Transactions of the Interstate Antelope Conference

Transactions of the North American Wild Sheep Conference (Second meeting in 1976)

Transactions of the Desert Bighorn Council (Annual meeting beginning 1957)

Proceedings of the International Mountain Goat Symposium

Proceedings of the Annual Conference of Western Association of State Game & Fish Commissioners (Annual conference beginning 1921)