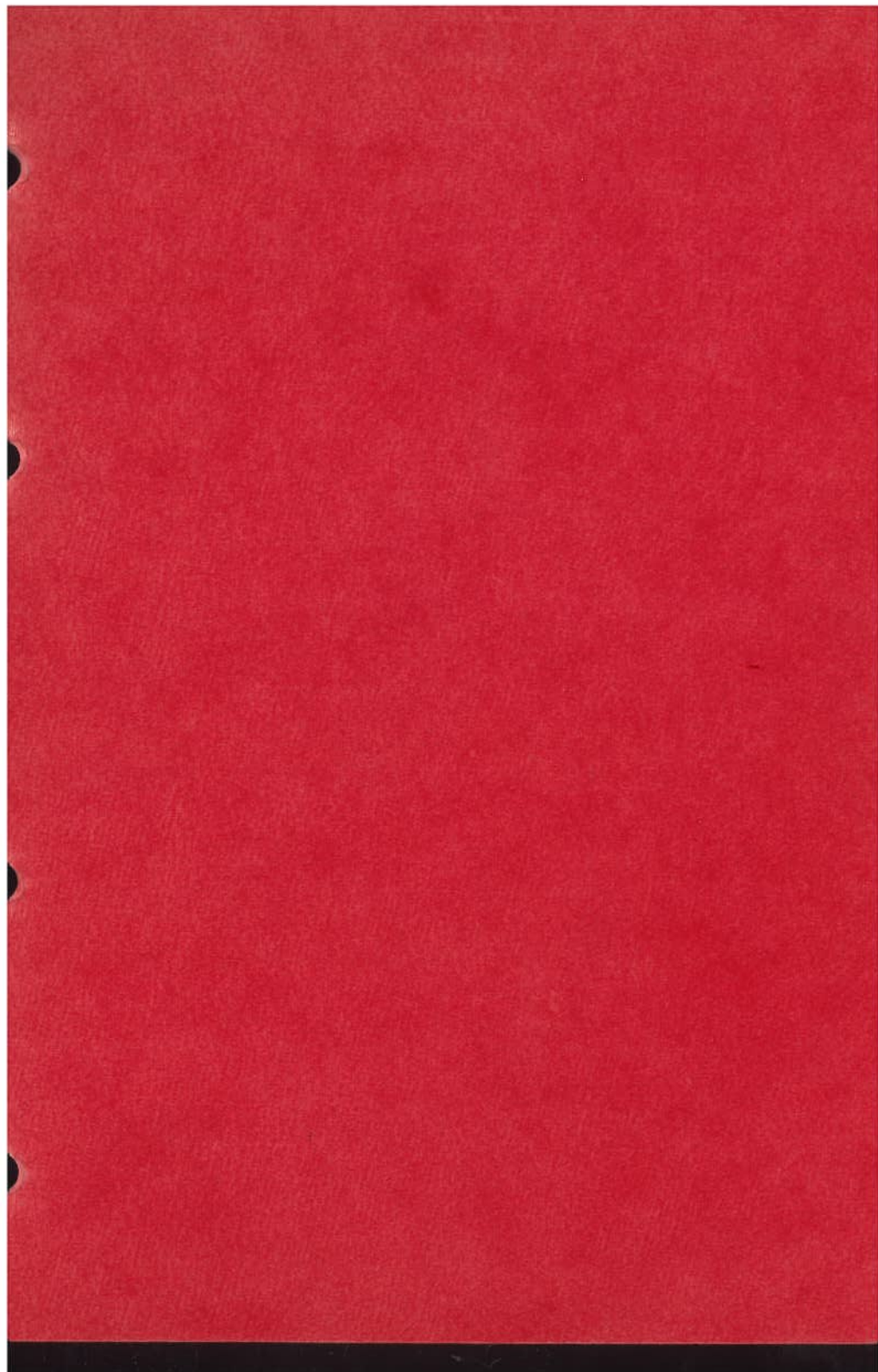
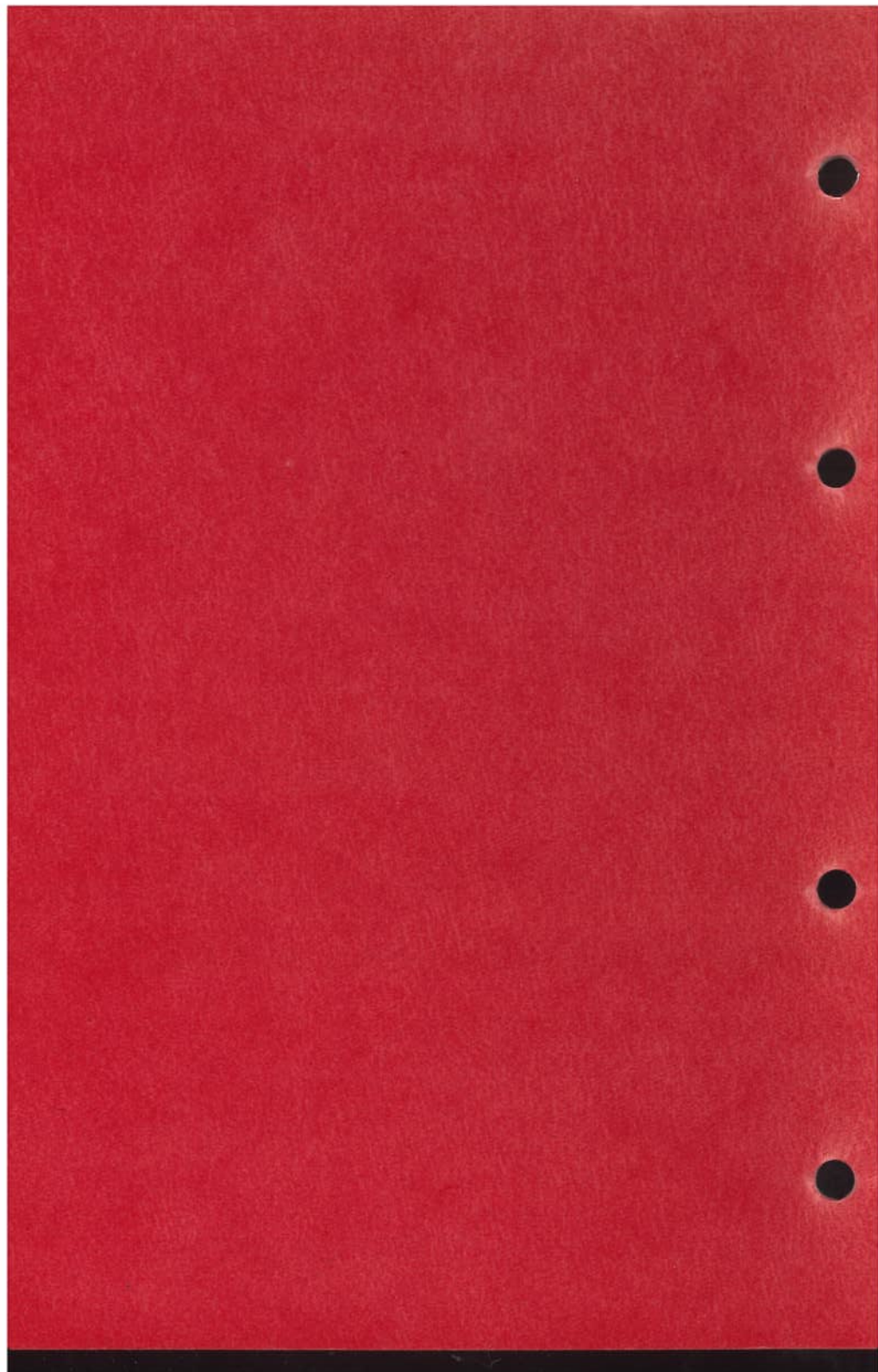


RED DATA BOOK 1





RED DATA BOOK VOLUME I MAMMALIA

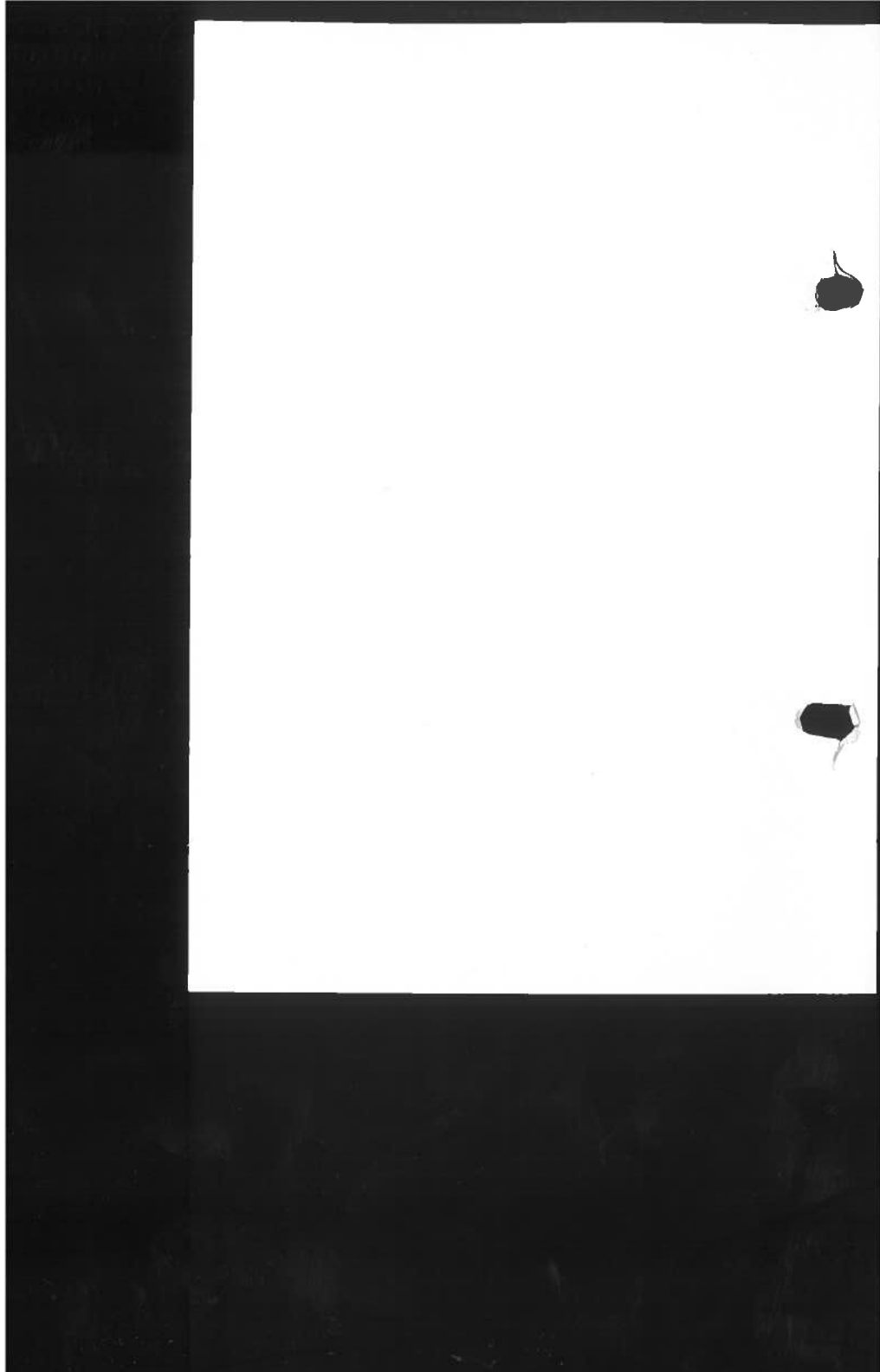
CORRIGENDA

The following amendments all apply to the "References" section of the relevant data sheets:

Code number of sheet

MA/101/HYAEN/BRU	Stevenson-Hamilton: for "1947" substitute "1954". Bateman: for "1964" substitute "1961".
MA/102/FELIS/CON/COR	Cahalane: for "1947" substitute "1961".
MA/102/PANTH/TIG/VIR	Ognev: for "1935" substitute "1962". Lavrenko and Kirikov: for "1958" substitute "1961".
MA/110/TRICH/MAN/MAN	for "Bertram, 1962" substitute "Bertram and Bertram, 1962".
MA/111/EQUUS/HEM/ONA	Lavrenko and Kirikov: for "1958" substitute "1961".
MA/111/EQUUS/HEM/KHU	Gee: for "1962" substitute "1963".
MA/119/CERVU/ELA/BAC	Lavrenko and Kirikov: for "1958" substitute "1961". Flerov: for "1952" substitute "1960".
MA/119/RANGI/TAR/PEA	Flerov: for "1952" substitute "1960".
MA/122/CEPHA/JEN	Walker: for "1965" substitute "1964".
MA/122/DAMAL/DOR/DOR	Bigalke: for "1956" substitute "1955".
MA/122/GAZEL/DOR/SAU	for "Sanborn, 1953" substitute "Sanborn and Hoogstraal, 1953".

June 1966.



INTERNATIONAL UNION
FOR CONSERVATION
OF NATURE AND NATURAL
RESOURCES
SURVIVAL SERVICE COMMISSION
1110 Morges, Switzerland

RED DATA BOOK

VOLUME 1 — MAMMALIA

a compilation
by
NOEL SIMON

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1966
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Introduction

The IUCN Survival Service Commission has been faced with constant difficulties from lack of reliable information on the majority of mammals which qualify as "rare and endangered" species.

To meet the situation the SSC decided to establish a list of mammals falling within this category, and to set up a programme for the acquisition and collation of data on each of the listed species.

In a number of instances where, despite all efforts, reliable information about reputedly rare or endangered species so far remains inadequate, it has been hard to decide whether or not to include them. In many borderline cases, decisions have for the time being had to be taken in an arbitrary manner. The list is therefore intended to be flexible, additions or deletions being made as and when sufficient firm evidence is obtained to enable a more accurate assessment of each animal's status to be made. Adoption of a loose-leaf format allows each report to be replaced whenever new data warrant the publication of a more comprehensive or more up to date sheet.

Purpose of the volume

Material is assembled in the form of short reports, not exceeding two sides of a page, under a series of uniform headings. Each report is therefore an abstract of available data, and this, in combination with the standardized method of presentation, has the advantage of enabling the reader to refer at once to the particular information he requires. It also serves the equally important purpose of showing at a glance what is not known and what gaps need to be filled. It is therefore hoped that the publication of these reports will stimulate interest in filling the gaps as well, of course, as helping to encourage action to remedy the situations described.

Supplementary List

The present column covers mammals believed to be rare and endangered. It excludes the large number which are rare in the sense that they are known only from a type specimen or a type locality, unless there is good reason to believe that they are also endangered. Many rarities may be scarce only in museums or as observed by humans, and these have accordingly been relegated to a Supplementary List, which it is not at present intended to publish.

Subspecific forms

In a number of instances it has been considered appropriate to give each race of a particular species a separate data sheet, especially when dealing with wide-ranging species distributed over several or many different countries, or in some instances over more than one zoogeographical region. For reasons of national pride there is often a better chance that a government will take responsibility for effective action to safeguard a race known to be more or less restricted to its own country than interest itself in a species which occurs over a wide region.

First issue of data sheets

The current list of rare and endangered mammals names 277 species and subspecies. The present volume is being published with 210 data sheets. The remaining 67 will be issued as and when completed, and will be despatched to subscribers at approximately six-monthly intervals, together with any replacement sheets for species on which significant new information becomes available. Thus the number of data sheets in each twice-yearly issue will vary according to circumstances. It is hoped in this way to provide a service, not available elsewhere, which will ensure that subscribers have information that can be relied upon as fully up to date.

Any necessary explanations will be circulated with each fresh consignment of data sheets and, if studied carefully, should obviate queries and correspondence. To avoid confusion it will generally be found advisable to destroy original sheets removed from the volume when replacements are received.

Classification

With few exceptions the system of classification adopted for the data sheets follows the undermentioned authors, details of whose publications are included in the bibliography:

Allen, 1939

Cabrera, 1957-1960

Chasen, 1940

Ellerman and Morrison-Scott, 1951

Ellerman, Morrison-Scott and Hayman, 1953

Hall and Kelson, 1959

Iredale and Troughton, 1934

Laurie and Hill, 1954

Medway, 1965

Morris, 1965

Simpson, 1945

Taylor, 1934

Bibliography

The bibliography is not designed to be comprehensive but includes only those works which have actually been employed in compiling the data sheets. A new issue of the bibliography will be sent to subscribers at irregular intervals whenever sufficient titles have accumulated to justify printing a fresh edition.

Coloured sheets

Pink sheets are used to draw particular attention to those mammals which are believed to be the most gravely endangered.

Green sheets are used for mammals whose survival was at one time in question but which are now regarded as out of danger. They are not included in the index since that is essentially a checklist of rare and endangered forms.

Code number and sequence

Because deletions and additions will periodically be made to the list, numbering of pages would be inappropriate. Instead a "code number" has been given to each sheet to facilitate placing it in the correct sequence. This comprises: the prefix MA = Mammalia; the number in the Index of Families; the first five letters of the generic name, the first three letters of the specific name and, where applicable, the first three letters of the subspecific name. In accordance with this code, therefore, the species will be placed in alphabetical sequence *within the family*. Some subscribers may of course prefer to follow the Systematic order of species used in the Index.

The reference number in the bottom left hand corner of the sheet, set at right angles to the text, should be ignored since it is only for the convenience of the printers.

Measures proposed

In order to avoid any possibility of misunderstanding, it is necessary to explain that proposals under this head are derived from a variety of sources. They are included in the data sheet, without prejudice, to indicate that they have actually been made but not necessarily that they have the considered support of IUCN. Conversely, where no entry is included under this head, IUCN may well have proposals under consideration, but not yet at the stage where they can be published.

Acknowledgements

The collection of the basic information contained in this volume has involved a systematic search of the literature as well as correspondence with zoologists, museums, game departments, national park authorities and many other sources, without whose assistance little progress could have been made. The names of those who have kindly provided information are recorded on the relevant data sheet under "References", and their generous help is gratefully acknowledged. Much more information is required, however, and IUCN would be glad to receive any further data that would help to make the reports as accurate and as comprehensive as possible.

RED DATA BOOK

Volume 1

I N D E X

January 1966

MARSUPIALIA

<u>Planigale tenuirostris</u>	Southern planigale
<u>Planigale subtilissima</u>	Kimberley planigale
<u>Phascogale calura</u>	Red-tailed phascogale
<u>Sminthopsis longicaudata</u>	Long-tailed sminthopsis
<u>Antechinus laniger</u>	Eastern jerboa marsupial
<u>Dasyurus viverrinus</u>	Eastern native cat
<u>Dasyurinus geoffroyi geoffroyi</u>	Western native cat
<u>Thylacinus cynocephalus</u>	Thylacine
<u>Myrmecobius fasciatus rufus</u>	Rusty numbat
<u>Perameles fasciata</u>	Eastern barred-bandicoot
<u>Perameles bougainvillei</u>	Western barred-bandicoot
<u>Macrotis lagotis</u>	Rabbit bandicoot
<u>Chaeropus ecaudatus</u>	Pig-footed bandicoot
<u>Phalanger orientalis peninsulae</u>	Grey cuscus
<u>Gymnobelideus leadbeateri</u>	Leadbeater's possum
<u>Wyulda squamicaudata</u>	Scaly-tailed possum
<u>Pseudocheirus occidentalis</u>	Western ring-tail
<u>Vombatus ursinus ursinus</u>	Flinders Island wombat
<u>Lasiiorhinus latifrons latifrons</u>	Hairy-nosed wombat
<u>Lagorchestes hirsutus</u>	Western hare-wallaby
<u>Lagostrophus fasciatus</u>	Banded hare-wallaby
<u>Petrogale penicillata penicillata</u>	Brush-tailed rock-wallaby
<u>Petrogale xanthopus xanthopus</u>	Ring-tailed rock-wallaby
<u>Onychogalea fraenata</u>	Bridled nail-tail wallaby
<u>Onychogalea lunata</u>	Crescent nail-tail wallaby
<u>Protemnodon parma</u>	White-throated wallaby
<u>Bettongia penicillata penicillata</u>	Brush-tailed rat-kangaroo
<u>Bettongia lesueuri</u>	Lesueur's rat-kangaroo
<u>Bettongia cuniculus</u>	Tasmanian rat-kangaroo
<u>Caloprymnus campestris</u>	Desert rat-kangaroo
<u>Potorous tridactylus tridactylus</u>	Long-nosed rat-kangaroo
<u>Hypsiprymnodon moschatus</u>	Musky rat-kangaroo

INSECTIVORA

Atopogale cubana
Solenodon paradoxus
Podogymnura truei
Galemys pyrenaicus

Cuban solenodon
 Haitian solenodon
 Mindanao gymnure
 Pyrenean desman

PRIMATES

Hapalemur griseus
Hapalemur simus
Lemur macaco macaco
Lemur macaco rufus
Lemur macaco flavifrons
Lemur macaco sanfordi
Lemur mongoz mongoz
Lemur mongoz coronatus
Lepilemur mustelinus ruficaudatus
Lepilemur mustelinus dorsalis
Lepilemur mustelinus leucopus
Cheirogaleus trichotis
Cheirogaleus medius
Microcebus coquereli
Phaner furcifer
Avahi laniger occidentalis
Propithecus diadema perrieri
Propithecus verreauxi verreauxi
Propithecus verreauxi coquereli
Propithecus verreauxi deckenii
Propithecus verreauxi coronatus
Propithecus verreauxi majori
Indri indri
Daubentonia madagascariensis
Arctocebus calabarensis
Euticus elegantulus
Cacajao calvus
Cacajao rubicundus
Cacajao melanocephalus
Chiropotes albinasus
Brachyteles arachnoides

Grey gentle lemur
 Broad-nosed gentle lemur
 Black lemur
 Red-fronted lemur
 Sclater's lemur
 Sanford's lemur
 Mongoose lemur
 Crowned lemur
 Red-tailed weasel lemur
 Nossi-Bé weasel lemur
 White-footed weasel lemur
 Hairy-eared dwarf lemur
 Fat-tailed lemur
 Coquerel's mouse lemur
 Fork-marked mouse lemur
 Western woolly avahi
 Perrier's sifaka
 Verreaux's sifaka
 Coquerel's sifaka
 Decken's sifaka
 Crowned sifaka
 Forsyth-Major's sifaka
 Indris
 Aye-aye
 Angwantibo
 Needle-clawed bushbaby
 Bald uakari
 Red uakari
 Black-headed uakari
 White-nosed saki
 Woolly spider monkey

Callimico goeldii
Leontideus chrysomelas
Leontideus chrysopygus
Cynopithecus niger
Cercocebus galeritus galeritus
Pygathrix nemaeus
Rhinopithecus roxellanae
Simias concolor
Colobus badius kirkii
Colobus badius rufomitatus
Colobus badius gordonorum
Colobus verus
Hylobates klossi
Pongo pygmaeus
Pan paniscus
Gorilla gorilla beringei

Goeldi's tamarin
Golden-headed tamarin
Golden-rumped tamarin
Black ape
Tana River mangabey
Douc langur
Snub-nosed monkey
Pig-tailed langur
Zanzibar red colobus
Tana River red colobus
Uhehe red colobus
Green colobus
Dwarf gibbon
Orang-utan
Pygmy chimpanzee
Mountain gorilla

EDENTATA

Priodontes giganteus
Chlamyphorus truncatus
Burmeisteria retusa

Giant armadillo
Lesser pichiciego
Greater pichiciego

LAGOMORPHA

Pentalagus furnessi
Romerolagus diazi
Caprolagus hispidus
Nesolagus netscheri

Liukiu rabbit
Volcano rabbit
Assam rabbit
Short-eared rabbit

RODENTIA

Sciurus kaibabensis
Sciurus niger cinereus
Sciurus niger vulpinus
Epixerus ebii
Epixerus wilsoni
Lariscus hosei
Cynomys parvidens
Dipodomys elephantinus

Kaibab squirrel
Delmarva Peninsula fox squirrel
Eastern fox squirrel
African palm squirrel
Wilson's palm squirrel
Bornean striped ground squirrel
Utah prairie dog
Big-eared kangaroo rat

Dipodomys elator
Reithrodontomys raviventris
Reithrodon physodes typicus
Phenacomys albipes
Phenacomys silvicola
Microtus pennsylvanicus provectus
Microtus breweri
Microtus xanthognathus
Tokudaia osimensis muenninki
Chinchilla lanigera
Capromys melanurus
Capromys nana
Plagiodontia aedium
Plagiodontia hylaeum
Geocapromys brownii brownii
Geocapromys brownii thoracatus
Geocapromys ingrahami

Texas kangaroo rat
Salt-marsh harvest mouse
Pampas gerbil
White-footed vole
Dusky tree mouse
Block Island meadow vole
Beach meadow vole
Yellow-cheeked vole
Liukiu spiny rat
Chinchilla
Bushy-tailed hutia
Dwarf hutia
Cuvier's hutia
Dominican hutia
Jamaican hutia
Little Swan Island hutia
Ingraham's hutia

CETACEA

Balaenoptera physalus
Balaenoptera musculus musculus
Balaenoptera musculus brevicauda
Megaptera novaeangliae
Balaena mysticetus
Eubalaena glacialis
Eubalaena sieboldii
Eubalaena australis

Fin whale
Blue whale
Pygmy blue whale
Humpback whale
Greenland right whale
North Atlantic right whale
North Pacific right whale
Southern right whale

CARNIVORA

Canis lupus lycaon
Canis niger
Vulpes macrotis nevadensis
Chrysocyon brachyurus
Speothos venaticus
Tremarctos ornatus
Selenarctos thibetanus formosanus
Ursus americanus emmonsii
Ursus nelsoni

Timber wolf
Red wolf
Nevada kit fox
Maned wolf
Bush dog
Spectacled bear
Formosan black bear
Glacier bear
Mexican grizzly bear

Ursus richardsoni
Thalarcos maritimus
Ailuropoda melanoleuca
Mustela nigripes
Martes flavigula chrysospila
Pteronura brasiliensis
Enhydra lutris nereis
Chrotogale owstoni
Diplogale hosei
Cynogale bennetti
Hyaena brunnea
Hyaena hyaena barbara
Felis lynx pardina
Felis concolor cougar
Felis concolor coryi
Neofelis nebulosa brachyurus
Panthera leo persica
Panthera tigris virgata
Panthera tigris sondaica
Panthera tigris amoyensis
Panthera tigris balica
Panthera tigris sumatrae
Panthera pardus panthera
Panthera pardus nimr
Panthera pardus tulliana
Panthera pardus orientalis
Panthera pardus adersi
Panthera pardus jarvisi
Acinonyx jubatus venaticus

Barren Ground grizzly bear
 Polar bear ✕
 Giant panda
 Black-footed ferret
 Formosan yellow-throated marten
 Giant otter
 Southern sea otter
 Owston's banded civet
 Hose's palm civet
 Otter civet
 Brown hyaena
 Barbary hyaena
 Spanish lynx
 Eastern panther
 Florida cougar
 Formosan clouded leopard
 Asiatic lion
 Caspian tiger
 Javan tiger
 Chinese tiger
 Bali tiger
 Sumatran tiger
 Barbary leopard
 Arabian leopard
 Transcaucasian leopard
 Korean leopard
 Zanzibar leopard
 Sinai leopard
 Asiatic cheetah

PINNIPEDIA

Arctocephalus a. galapagoensis
Arctocephalus philippii
Zalophus californianus japonicus
Odobenus rosmarus rosmarus
Phoca kurilensis
Histriophoca fasciata
Ommatophoca rossi
Monachus monachus

Galapagos fur seal
 Guadalupe fur seal
 Japanese sea lion
 Atlantic walrus
 Kurile harbour seal
 Ribbon seal
 Ross seal
 Mediterranean monk seal

Monachus tropicalis
Monachus schauinslandi

Caribbean monk seal
Hawaiian monk seal

PROBOSCIDEA

Elephas maximus maximus

Ceylon elephant

SIRENIA

Dugong dugon
Hydrodamalis stelleri
Trichechus manatus manatus
Trichechus manatus latirostris
Trichechus inunguis
Trichechus senegalensis

Dugong
Steller's sea-cow
West Indian manatee
Florida manatee
Amazonian manatee
West African manatee

PERISSODACTYLA

Equus przewalski
Equus hemionus hemionus
Equus hemionus onager
Equus hemionus khur
Equus hemionus kiang
Equus hemionus hemippus
Equus asinus africanus
Equus asinus somalicus
Equus zebra zebra
Equus zebra hartmannae
Tapirus pinchaque
Tapirus bairdii
Rhinoceros unicornis
Rhinoceros sondaicus
Didermoceros sumatrensis
Ceratotherium simum cottoni
Diceros bicornis

Przewalski's horse
Mongolian wild ass
Persian onager
Indian wild ass
Tibetan wild ass
Syrian wild ass
Nubian wild ass
Somali wild ass
Cape mountain zebra
Hartmann's mountain zebra
Mountain tapir
Central American tapir
Great Indian rhinoceros
Javan rhinoceros
Sumatran rhinoceros
Northern square-lipped rhinoceros
Black rhinoceros

ARTIODACTYLA

Sus salvanus
Choeropsis liberiensis

Pygmy hog
Pygmy hippopotamus

<u>Camelus bactrianus ferus</u>	Wild Bactrian camel
<u>Muntiacus reevesi micrurus</u>	Formosan muntjac
<u>Muntiacus crinifrons</u>	Black muntjac
<u>Muntiacus feae</u>	Fea's muntjac
<u>Dama mesopotamica</u>	Persian fallow deer
<u>Cervus duvauceli</u>	Swamp deer
<u>Cervus eldi eldi</u>	Manipur brow-antlered deer
<u>Cervus eldi siamensis</u>	Thailand brow-antlered deer
<u>Cervus nippon taiouanus</u>	Formosan sika
<u>Cervus nippon mandarinus</u>	North China sika
<u>Cervus nippon kopschi</u>	South China sika
<u>Cervus nippon grassianus</u>	Shansi sika
<u>Cervus nippon keramae</u>	Riu Kiu sika
<u>Cervus albirostris</u>	Thorold's deer
<u>Cervus elaphus corsicanus</u>	Corsican deer
<u>Cervus elaphus barbarus</u>	Barbary stag
<u>Cervus elaphus hanglu</u>	Kashmir stag
<u>Cervus elaphus yarkandensis</u>	Yarkand stag
<u>Cervus elaphus bactrianus</u>	Bactrian wapiti
<u>Cervus elaphus macneilli</u>	M'Neill's deer
<u>Cervus nannodes</u>	Tule Elk
<u>Elaphurus davidianus</u>	Père David's deer
<u>Odocoileus virginianus clavium</u>	Key deer
<u>Odocoileus virginianus leucurus</u>	Columbia white-tailed deer
<u>Ozotoceros bezoarticus</u>	Pampas deer
<u>Pudu pudu</u>	Chilean pudu
<u>Rangifer tarandus pearsoni</u>	Novaya Zemlya reindeer
<u>Antilocapra americana mexicana</u>	Mexican pronghorn
<u>Antilocapra americana peninsularis</u>	Lower California pronghorn
<u>Antilocapra americana sonoriensis</u>	Sonora pronghorn
<u>Tragelaphus buxtoni</u>	Mountain nyala
<u>Taurotragus derbianus derbianus</u>	Western giant eland
<u>Bubalus bubalis</u>	Asiatic buffalo
<u>Anoa mindorensis</u>	Tamarau
<u>Anoa depressicornis depressicornis</u>	Lowland anoa
<u>Anoa depressicornis fergusoni</u>	Mountain anoa
<u>Anoa depressicornis quarlesi</u>	Quarle's anoa
<u>Bos gaurus hubbacki</u>	Seladang
<u>Bos sauveli</u>	Kouprey
<u>Bos grunniens mutus</u>	Wild yak

<u>Bison bonasus</u>	European bison
<u>Bison bison athabasca</u>	Wood bison
<u>Cephalophus jentinki</u>	Jentink's duiker
<u>Hippotragus niger variani</u>	Giant sable antelope
<u>Oryx leucoryx</u>	Arabian oryx
<u>Oryx tao</u>	Scimitar-horned oryx
<u>Addax nasomaculatus</u>	Addax
<u>Damaliscus dorcas dorcas</u>	Bontebok
<u>Alcelaphus buselaphus tora</u>	Tora hartebeest
<u>Alcelaphus buselaphus swaynei</u>	Swayne's hartebeest
<u>Nesotragus moschatus moschatus</u>	Zanzibar suni
<u>Dorcatragus megalotis</u>	Beira antelope
<u>Aepyceros melampus petersi</u>	Black-faced impala
<u>Gazella dorcas neglecta</u>	Algerian dorcas gazelle
<u>Gazella dorcas massaesyla</u>	Moroccan dorcas gazelle
<u>Gazella dorcas saudiya</u>	Saudi Arabian dorcas gazelle
<u>Gazella gazella arabica</u>	Arabian gazelle
<u>Gazella gazella cuvieri</u>	Cuvier's gazelle
<u>Gazella leptocerus leptocerus</u>	Slender-horned gazelle
<u>Gazella leptocerus marica</u>	Sand gazelle
<u>Gazella pelzelni</u>	Pelzel's gazelle
<u>Gazella dama mhorri</u>	Mhorri gazelle
<u>Gazella dama lozanoi</u>	Rio de Oro dama gazelle
<u>Nemorhaedus cranbrooki</u>	Red goral
<u>Capricornis sumatraensis sumatraensis</u>	Sumatran serow
<u>Capricornis crispus crispus</u>	Japanese serow
<u>Capricornis crispus swinhoi</u>	Formosan serow
<u>Budorcas taxicolor tibetana</u>	Szechwan takin
<u>Budorcas taxicolor bedfordi</u>	Golden takin
<u>Hemitragus jayakari</u>	Arabian tahr
<u>Hemitragus hylocrius</u>	Nilgiri tahr
<u>Capra walia</u>	Walia ibex
<u>Capra pyrenaica pyrenaica</u>	Pyrenean ibex
<u>Capra falconeri falconeri</u>	Astor markhor
<u>Capra falconeri megaceros</u>	Kabul markhor
<u>Capra falconeri jerdoni</u>	Suleman markhor
<u>Capra falconeri cashmiriensis</u>	Pir Panjal markhor
<u>Capra falconeri chialtanensis</u>	Chiltan markhor
<u>Capra falconeri heptneri</u>	Tadjikistan markhor
<u>Ovis orientalis ophion</u>	Cyprian mouflon

CLASSIFICATION OF RARE FORMS

Categories:

- 1 Very rare and believed to be decreasing in numbers.
- 2 Less rare but believed to be threatened - requires watching.
- 3 Very rare but believed to be stable or increasing.
- 4 Status inadequately known - survey required or data sought.

Symbols:

- (a) Full species.
- (b) Subspecies.
- E Exotic, introduced or captive populations believed more numerous than indigenous stock.
- M Under active management in a national park or other reserve.
- P Legally protected, at least in some parts of its range.
- R Included because of its restricted range.
- S Secrecy still desirable.
- T Subject to substantial export trade.

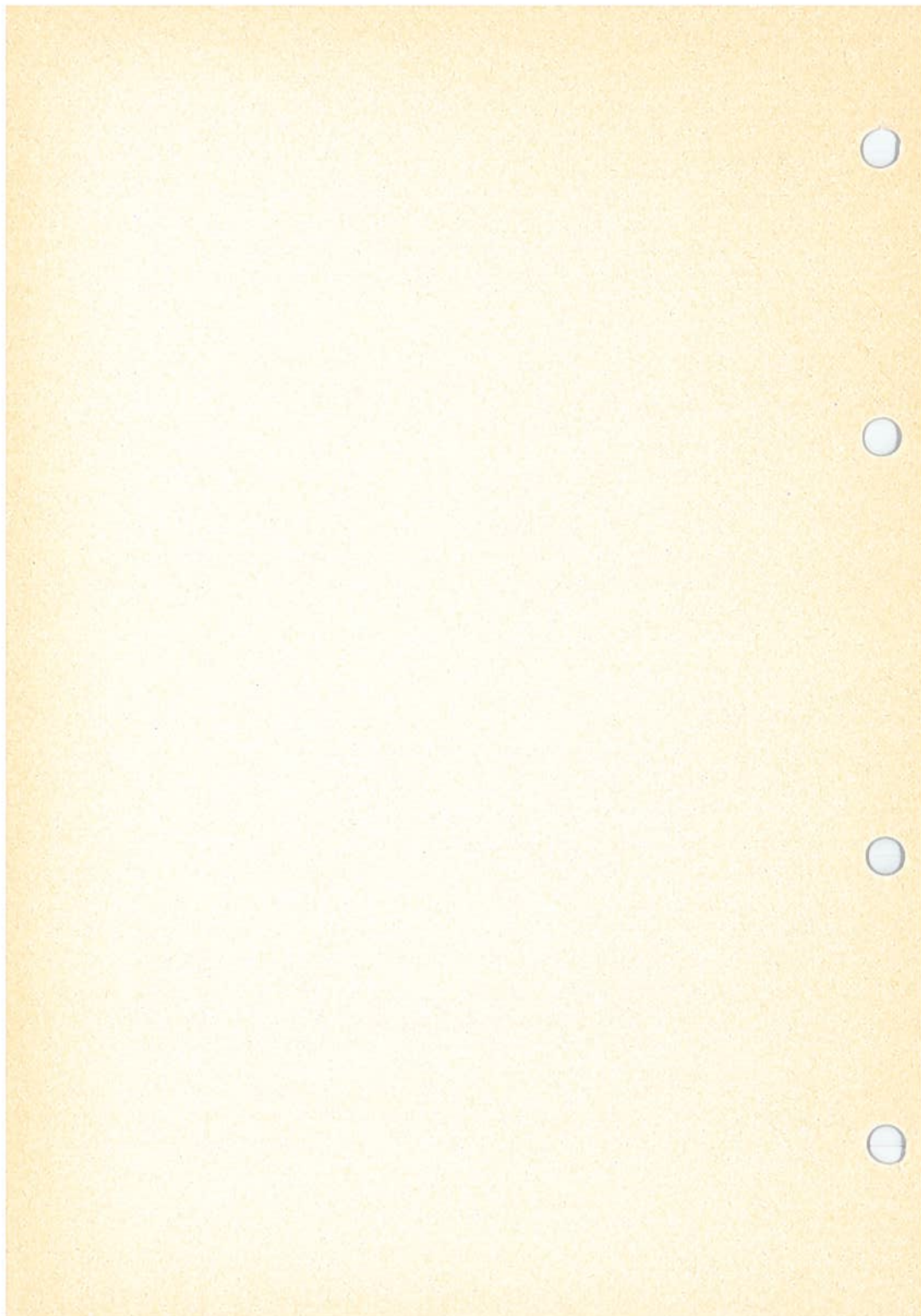
'Star' listing:

Species or subspecies of special importance:

- *** Giving cause for very grave anxiety.
- ** Giving cause for considerable anxiety.
- * Giving cause for some anxiety.

N.B.

- (i) Information concerning 'three-star' (***) forms is shown on pink sheets.
- (ii) These forms which were formerly rare but have now recovered, to an extent that they are no longer endangered, are shown on green sheets.



INDEX OF MAMMALIAN FAMILIES

MONOTREMATA	1	TACHYGLOSSIDAE	Echidnas
	2	ORNITHORHYNCHIDAE	Platypus
MARSUPIALIA	3	DIDELPHIDAE	Opossums
	4	DASYURIDAE	Marsupial mice, dasyures, etc.
	5	NOTORYCTIDAE	Marsupial moles
	6	PERAMELIDAE	Bandicoots
	7	CAENOLESTIDAE	Rat opossums
	8	PHALANGERIDAE	Phalangers, cuscuses, etc.
	9	VOMBATIDAE	Wombats
	10	MACROPODIDAE	Kangaroos and wallabies
INSECTIVORA	11	SOLENDONTIDAE	Solenodons
	12	TENRECIDAE	Tenrecs
	13	POTAMOGALIDAE	Otter shrews
	14	CHRYSOCHLORIDAE	Golden moles
	15	ERINACEIDAE	Hedgehogs
	16	MACROSCHELIDIDAE	Elephant shrews
	17	SORICIDAE	Shrews
	18	TALPIDAE	Moles and desmans
DERMOPTERA	19	CYNOCEPHALIDAE	Flying lemurs
CHIROPTERA	20	PTEROPIDAE	Fruit-bats
	21	RHINOPOMATIDAE	Mouse-tailed bats
	22	EMBALLONURIDAE	Sac-winged bats
	23	NOCTILIONIDAE	Bulldog bats
	24	NYCTERIDAE	Slit-faced bats
	25	MEGADERMATIDAE	False vampires
	26	RHINOLOPHIDAE	Horseshoe bats
	27	HIPPOSIDERIDAE	Leaf-nosed bats, etc.
	28	PHYLLOSTOMATIDAE	Spear-nosed bats, etc.
	29	DESMODONTIDAE	True vampires
	30	NATALIDAE	Funnel-eared bats
	31	FURIPTERIDAE	Furies, smoky bats
	32	THYROPTERIDAE	Disc-winged bats
	33	MYZOPODIDAE	Golden bat
	34	VESPERTILIONIDAE	Common bats
	35	MYSTACINIDAE	New Zealand short-tailed bat
	36	MOLOSSIDAE	Free-tailed bats

PRIMATES	37	TUPAIIDAE	Tree-shrews
	38	LEMURIDAE	Lemurs
	39	INDRIIDAE	Avahis, sifakas, indri
	40	DAUBENTONIIDAE	Aye-aye
	41	LORISIDAE	Loris, potto, etc.
	42	TARSIIDAE	Tarsiers
	43	CEBIDAE	New World monkeys
	44	CALLITHRICIDAE	Marmosets and tamarins
	45	CERCOPITHECIDAE	Old World monkeys
	46	PONGIDAE	Gibbons and great apes
	47	HOMINIDAE	Man
EDENTATA	48	MYRMECOPHAGIDAE	Anteaters
	49	BRADYPODIDAE	Sloths
	50	DASYPODIDAE	Armadillos
PHOLIDOTA	51	MANIDAE	Pangolins
LAGOMORPHA	52	OCHOTONIDAE	Pikas
	53	LEPORIDAE	Hares, rabbits
RODENTIA	54	APLODONTIDAE	Mountain beaver
	55	SCIURIDAE	Squirrels
	56	GEOMYIDAE	Pocket gophers
	57	HETEROMYIDAE	Pocket mice, kangaroo rats
	58	CASTORIDAE	Beavers
	59	ANOMALURIDAE	Scaly-tailed squirrels
	60	PEDETIDAE	Springhaas
	61	CRICETIDAE	Lemmings, hamsters, voles, etc.
	62	SPALACIDAE	Palaearctic mole rats
	63	RHIZOMYIDAE	Bamboo rats
	64	MURIDAE	Old World rats, etc.
	65	GLIRIDAE	Dormice
	66	PLATACANTHOMYIDAE	Spiny dormice
	67	SELEVINIIDAE	Selevinia
	68	ZAPODIDAE	Jumping mice
	69	DIPODIDAE	Jerboas
	70	HYSTRICIDAE	Old World porcupines
	71	ERETHIZONTIDAE	New World porcupines
	72	CAVIIDAE	Cavies, guinea pigs
	73	HYDROCHOERIDAE	Capybara
	74	DINOMYIDAE	Pacarana
	75	DASYPROCTIDAE	Agoutis, pacas

RODENTIA (Cont.)	76	CHINCHILLIDAE	Chinchillas, etc.
	77	CAPROMYIDAE	Hutias, etc.
	78	OCTODONTIDAE	South American bush rats, etc.
	79	CTENOMYIDAE	Tucotucos
	80	ABROCOMIDAE	Rat chinchillas
	81	ECHIMYIDAE	Spiny rats, etc.
	82	THRYONOMYIDAE	African cane rats
	83	PETROMYIDAE	Rock rat
	84	BATHYERGIDAE	African mole rats
	85	CTENODACTYLIDAE	Gundis
CETACEA	86	PLATANISTIDAE	River dolphins
	87	ZIPHIIDAE	Beaked whales
	88	PHYSETERIDAE	Sperm whales
	89	MONODONTIDAE	Narwhal, etc.
	90	STENIDAE	White dolphins, etc.
	91	DELPHINIDAE	Dolphins
	92	PHOCAENIDAE	Porpoises
	93	ESCHRICHTIDAE	Gray whale
	94	BALAENOPTERIDAE	Rorquals
	95	BALAENIDAE	Right whales
CARNIVORA	96	CANIDAE	Dogs, wolves, foxes
	97	URSIDAE	Bears
	98	PROCYONIDAE	Raccoons, coatis, pandas, etc.
	99	MUSTELIDAE	Weasels, martens, otters, etc.
	100	VIVERRIDAE	Genets, civets, mongooses, etc.
	101	HYAENIDAE	Hyaenas
	102	FELIDAE	Cats
PINNIPEDIA	103	OTARIIDAE	Eared seals
	104	ODOBENIDAE	Walrus
	105	PHOCIDAE	Seals
TUBULIDENTATA	106	ORYCTEROPODIDAE	Aardvarks
PROBOSCIDEA	107	ELEPHANTIDAE	Elephants
HYRACOIDEA	108	PROCAVIIDAE	Hyraxes
SIRENIA	109	DUGONGIDAE	Dugongs
	110	TRICHECHIDAE	Manatees

PERISSODACTYLA	111	EQUIDAE	Horses, asses, zebras
	112	TAPIRIDAE	Tapirs
	113	RHINOCEROTIDAE	Rhinoceroses
ARTIODACTYLA	114	SUIDAE	Old World pigs
	115	TAYASSUIDAE	Peccaries
	116	HIPPOPOTAMIDAE	Hippopotamuses
	117	CAMELIDAE	Llamas, camels, etc.
	118	TRAGULIDAE	Chevrotains
	119	CERVIDAE	Deer
	120	GIRAFFIDAE	Giraffe, okapi
	121	ANTILOCAPRIDAE	Pronghorn
	122	BOVIDAE	Cattle, antelopes, sheep, etc.

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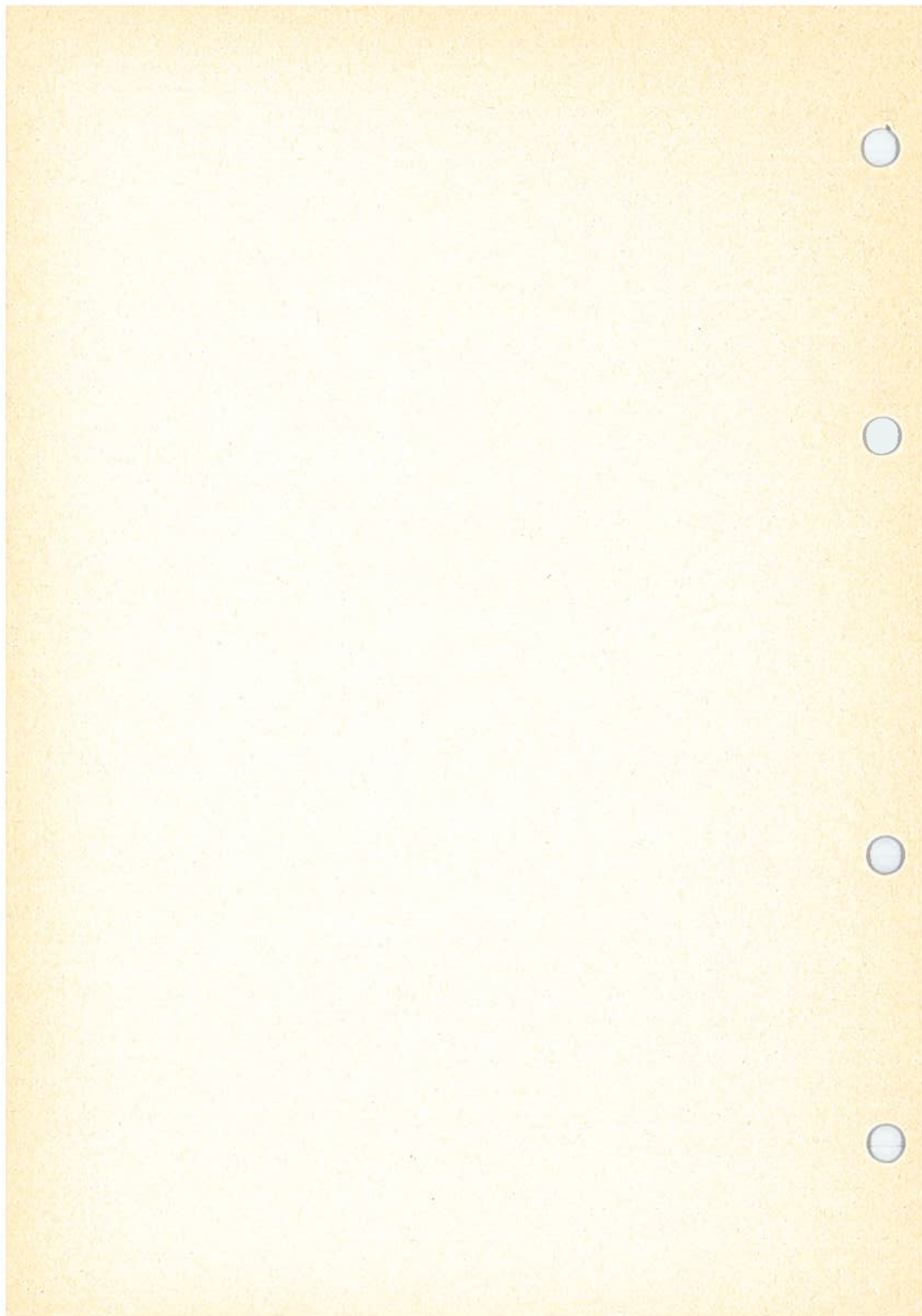
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SOUTHERN PLANIGALE

Planigale tenuirostris Troughton, 1928

Order MARSUPIALIA

Family DASYURIDAE

Distinguishing characteristics: "Distinguished from ingrahami by the dusky brown and more speckled back, different foot-pads, and the more elongated muzzle. Head and body length about $2\frac{1}{2}$ in., and the tail barely 2 in.; the tail thus relatively shorter than in ingrahami." (2:30)

Present distribution: Known only from the western plains of northern New South Wales between Wilcannia and Moree. (1:82)

Former distribution: Not known whether it formerly occupied a wider range. (3)

Status: Known from "only seven specimens recorded from four localities", one collected in 1890, the remainder between 1944 and 1953. (1:82) "It is not known whether the animal is increasing or decreasing." (3)

Estimated numbers: Unknown. This tiny mammal is usually seen only when collected by domestic cats. (3)

Breeding rate in wild: Nothing is known of its biology. (3)

Reasons for decline: Unknown. (3)

Protective measures already taken: Gazetted as 'Rare Fauna' in New South Wales. (3)

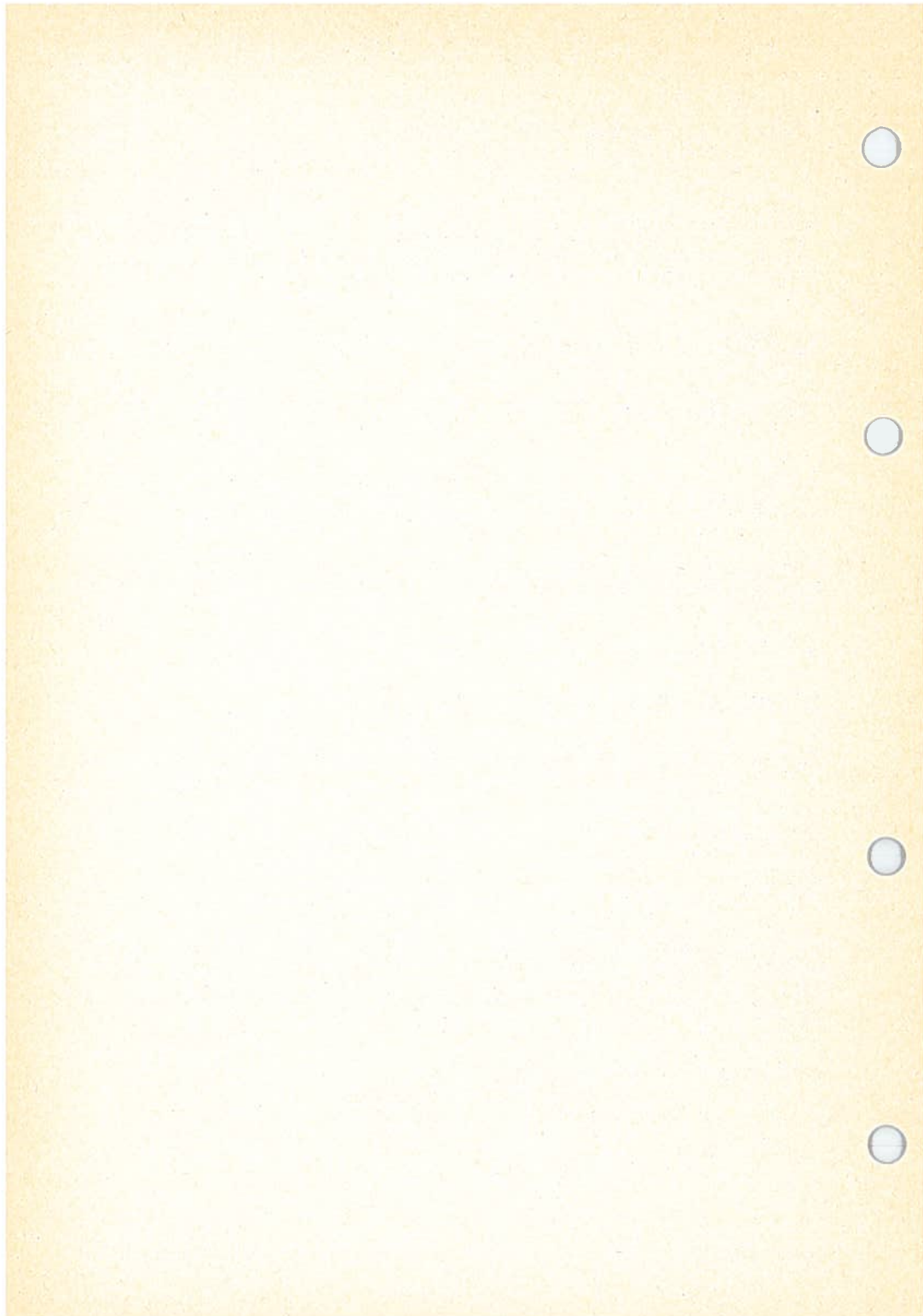
Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: "A difficult family to breed in captivity. Some species are very aggressive and losses of young may be high. The adults in some species also have a strong tendency to kill and eat each other. In most, if not all, species the male has to be separated from the female after mating." (3)

References:

1. Marlow, 1958
2. Troughton, 1962
3. J. H. Calaby, in litt. 30/1/63



KIMBERLEY PLANIGALE

Planigale subtilissima (Lonnberg, 1913)

Order MARSUPIALIA

Family DASYURIDAE

Distinguishing characteristics: A small mouse-like marsupial "with a characteristically flattened head, little more than $\frac{1}{2}$ in. from base to crown ... The general colouring of the body is greyish, the hairs being tipped with yellow near the sides of the body, the colour becoming much lighter on the ventral surface. The ears are covered only with short hairs, and appear quite transparent in strong light. The eyes, situated about midway between the ears and snout, are black, and bulge when the animals are frightened. Tactile vibrissae ("whiskers") are a feature of the snout, projecting to the width of the body ... The nostrils are set almost at the extreme tip of the snout in the same fashion as those of a dog, a division extending back to the mouth. The mouth, set back from the snout, opens to about half the length of the head and contains sharply pointed sets of teeth, top and bottom. ... The ears are specialised in that they can be folded or extended in the same way as those of a bat - and for the same reason in that they are nocturnal animals, although without any form of "bat radar" ... The head and body of an adult P. subtilissima measure about $1\frac{1}{2}$ to 2 inches in length, with the tail about $2\frac{1}{2}$ inches in length - another feature shared only by members of this genus. The tail tapers evenly from the root to tip and has a uniform covering of hairs with a very small tuft at the tip." (1:10)

Present distribution: Apparently confined to the Kimberley Division, northern Western Australia. The single type specimen was collected by Lonnberg in 1913 at Noonkambah on the Fitzroy River, north of the St. George Range, West Kimberley. In 1949 Rudeforth collected 6 specimens near Wyndham, Western Australia, some 300 miles from the type locality. (2)

Former distribution: Unknown.

Status: "It is possible that this species may not be rare, but little collecting has been done in its area of distribution." (2)

Estimated numbers: Unknown.

Breeding rate in wild:

Reasons for decline:

Protective measures already taken: Fully protected by law. (2)

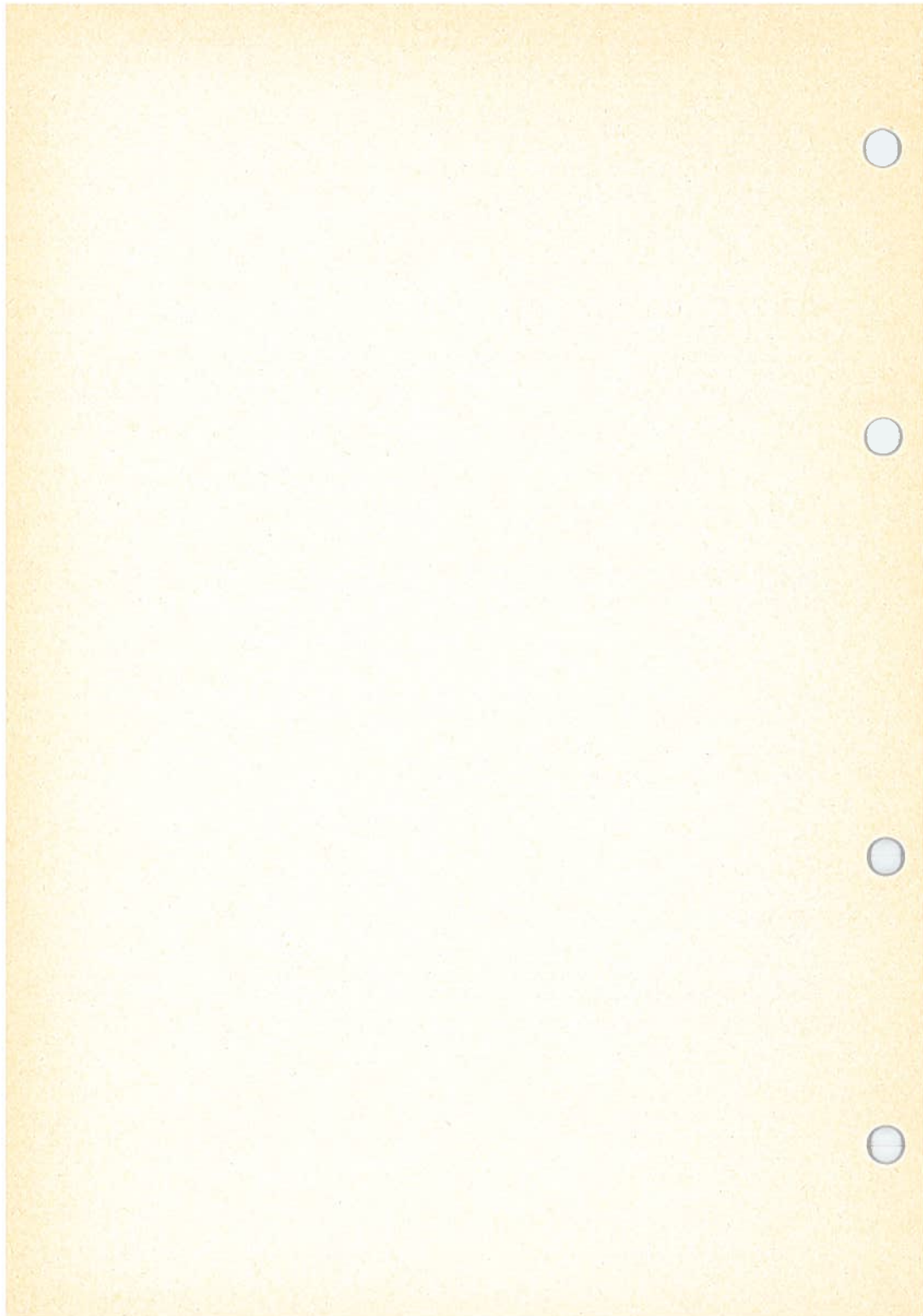
Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: Rudeforth kept four in captivity for several months but they did not breed. (1:10)

Remarks: "Members of this species are thought to be the smallest existing marsupials, so small that they are close to the lower limits of size postulated to exist for warm-blooded (or homoiothermic) animals." (1:10)

References: 1. Rudeforth, 1950
2. J.H. Calaby, in litt. 30/1/63 to 21/6/65



RED-TAILED PHASCOGALE

Phascogale calura Gould, 1844

Order MARSUPIALIA

Family DASYURIDAE

Distinguishing characteristics: "General color ashy gray; under parts creamy white; ears large, nearly naked except at base, where there are some yellow hairs; basal half of tail rusty red above, black below; terminal half bushy, black (Gould, 1844, p. 105). Head and body, 125 mm.; tail, 147 mm. (Thomas, 1888, p. 297)" (2:28)

Present distribution: Still occurs in the inland part of south-western Australia in the Narrogin-Kojonup-Pingrup area, where specimens are occasionally collected by house cats. (5)

Former distribution: "Today it is impossible to define its former range in the State [of South Australia], or, unfortunately, even to attest to its present existence." (1:102) "Kreffft states (1871, p. 40) that the animal occurs in New South Wales, near the Darling River, and Iredale and Troughton (1934, p. 8) include Victoria in the range." (2:29)

Status: "Presumably extinct in New South Wales, but still occurs in Western Australia." (3:83) "It is still of regular occurrence in the area defined under "Present distribution" and is occasionally seen by naturalists. In common with many Australian marsupials its ground density is low and probably always has been so. This does not necessarily mean that it is vanishing." (6)

Estimated numbers: Unknown.

Breeding rate in wild:

Reasons for decline: Finlayson considers that "long term climatic changes involving increased aridity and adverse vegetative changes" were probably the principal causes of decline. (4:149)

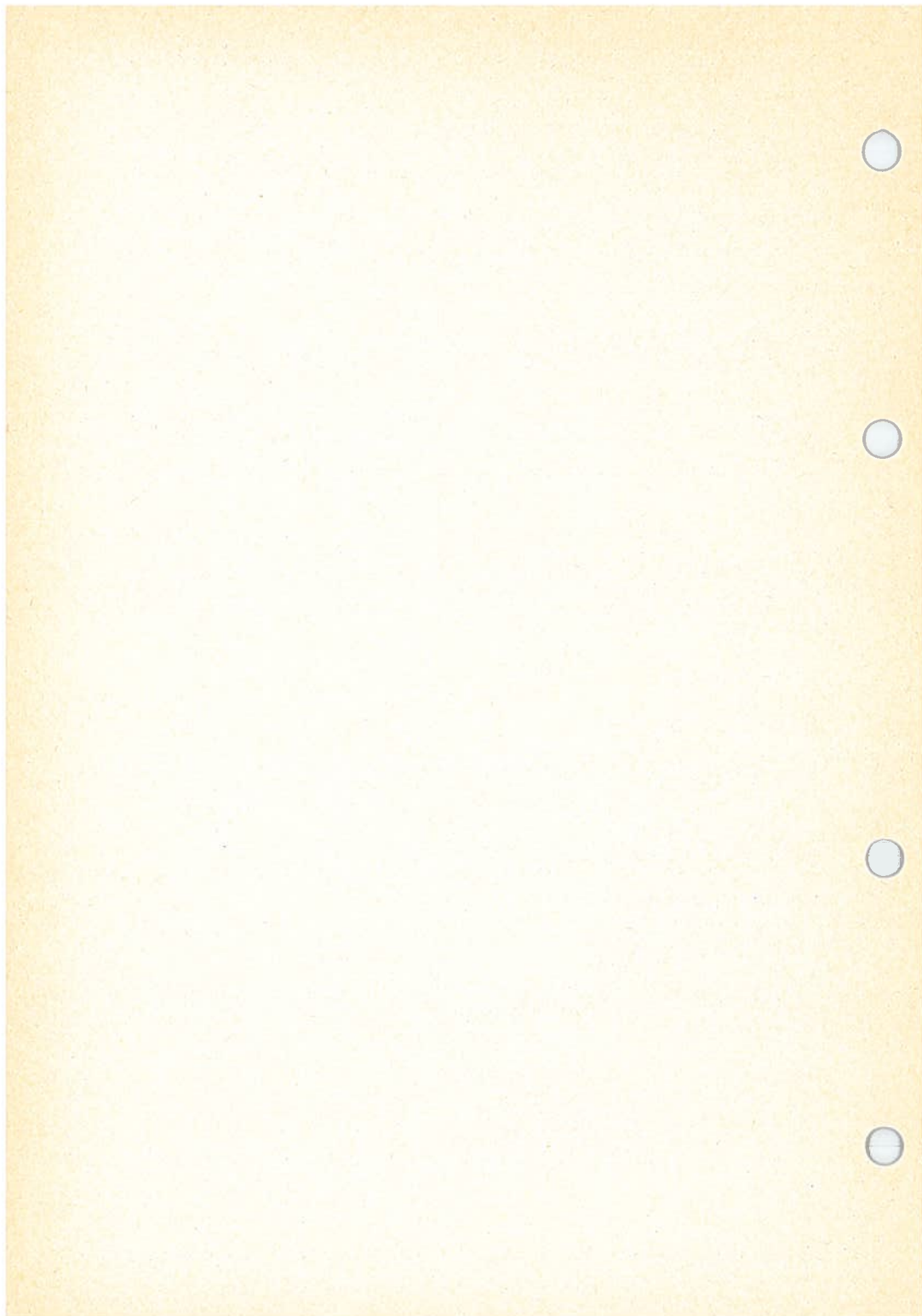
Protective measures already taken: Fully protected by law. (6)

Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: "Members of this family are difficult to breed in captivity. Some specimens are extremely aggressive and losses among young may be heavy." (6)

- References:
1. Wood Jones, 1923-25
 2. Harper, 1945
 3. Marlow, 1958
 4. Finlayson, 1961
 5. Troughton, 1962
 6. J. H. Calaby, in litt. 30/1/63 to 21/6/65



LONG-TAILED SMINTHOPSIS

Sminthopsis longicaudata Spencer, 1909

Order MARSUPIALIA

Family DASYURIDAE

Distinguishing characteristics: "General body color gray, tinged with rufous in parts; a darkish line through the eye; lips, chin, and feet white; tail scaly, with short stiff hairs. Head and body, 100 mm.; tail, 202 mm. (Spencer, 1909, pp. 449-450)." (1:31)

Present distribution: "The apparently total lack of additional information concerning the species, during 30 years past, does not augur well for its present status, although there is always a possibility that it may have survived in some out-of-the-way corner of Western Australia." (1:32)

Former distribution: "This species formerly inhabited north-western Australia and central Australia." (2)

Status: Extremely rare, if not extinct. "Other than the type specimen labelled 'West Australia' there is a specimen in the Western Australian Museum from the Marble Bar district, which has been recorded in the literature. In the National Museum of Victoria there is an undated specimen labelled 'Central Australia'. This specimen has not been recorded in the literature." (2)

Estimated numbers: Unknown.

Breeding rate in wild:

Reasons for decline:

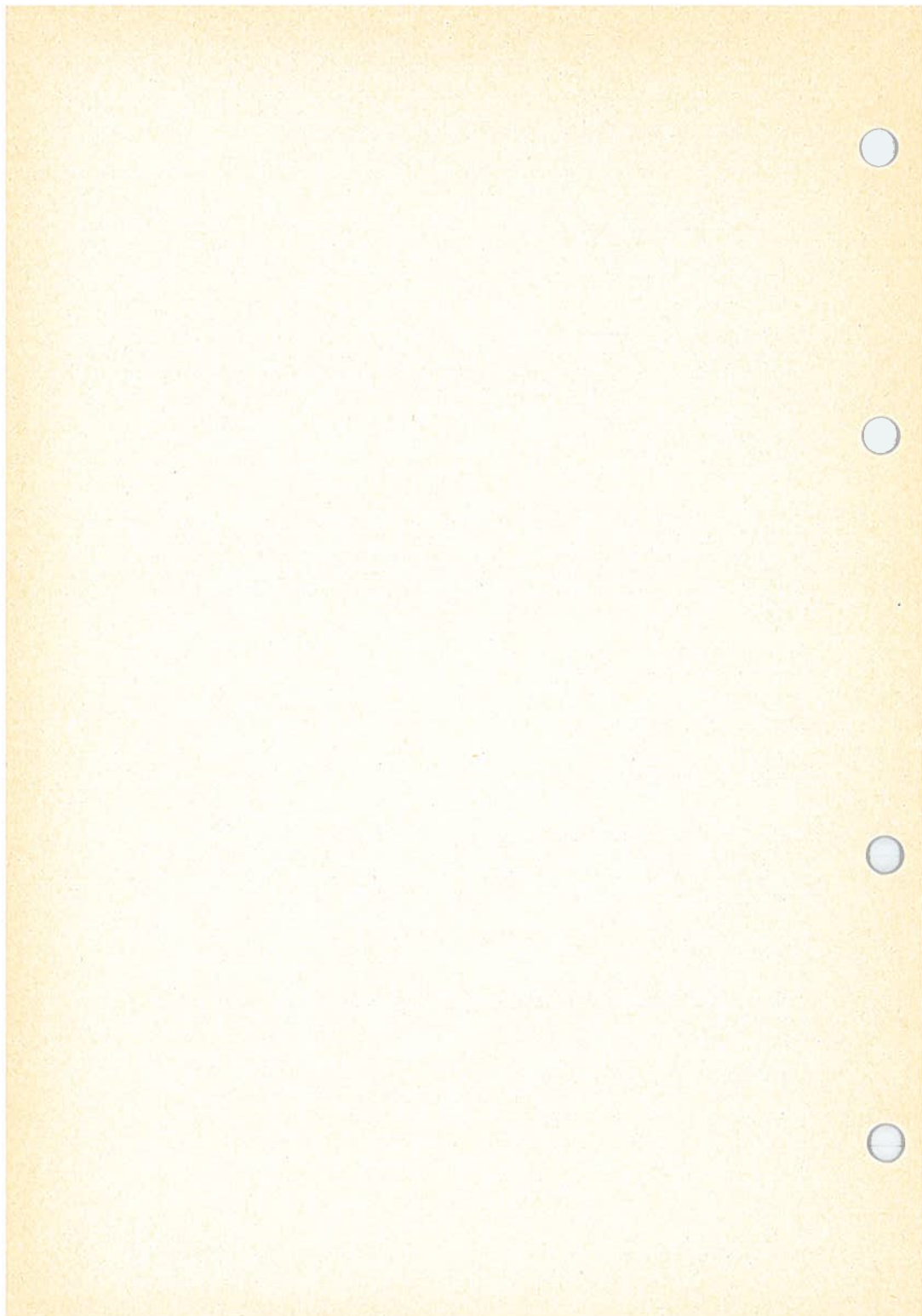
Protective measures already taken: Protected by law. (2)

Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: "A difficult family to breed in captivity." (2)

References: 1. Harper, 1945
2. J. H. Calaby, in litt. 30/1/63 to 21/6/65



EASTERN JERBOA MARSUPIAL

Antechinomys laniger (Gould, 1856)

Order MARSUPIALIA

Family DASYURIDAE

Distinguishing characteristics: "Small, mouse-like with grey head and body, belly white; long tail terminated with pencil of black hairs; hind limbs elongate, hallux absent; head and body 84 mm, tail 212 mm." (1:85)

Present distribution: "Woodland, now confined to the western plains between 30°S. and 33°S. and between 146°E. and 148°E., where it has been recorded from about ten localities including Byrock (30° 40'S., 146° 23'E.), Girilambone (31° 17'S., 146° 52'E.), and Nyngan (31° 34'S., 147° 0'E.). ... the most recent record is Miandetta (31° 34'S., 146° 58'E.) 1948; ... also found in Queensland and Victoria." (1:85-6) Lidicker (1965) records the capture of a young adult male specimen on 28 February 1964, 25 miles west of Cunnamulla. "This specimen represents the first known record since 1893" and raises the total number of specimens from Queensland to three. (3:328)

Former distribution: "Specimens collected between 1867 and 1890 indicate that it formerly occurred as far south as the Murray River and westward through Deniliquin (35° 32'S., 144° 58'E.) ... to the junction of the Murray and Darling Rivers." (1:86)

Status: "Rare in New South Wales." (1:86) "Nothing is known of its biology, habitat requirements, etc." (4)

Breeding rate in wild: Unknown. In 1865 Krefft recorded two specimens obtained on the Lower Murray, one being a female with ten teats and seven young. (2:41)

Reasons for decline: Unknown.

Protective measures already taken: "Legally gazetted 'Rare Fauna' in New South Wales." (4)

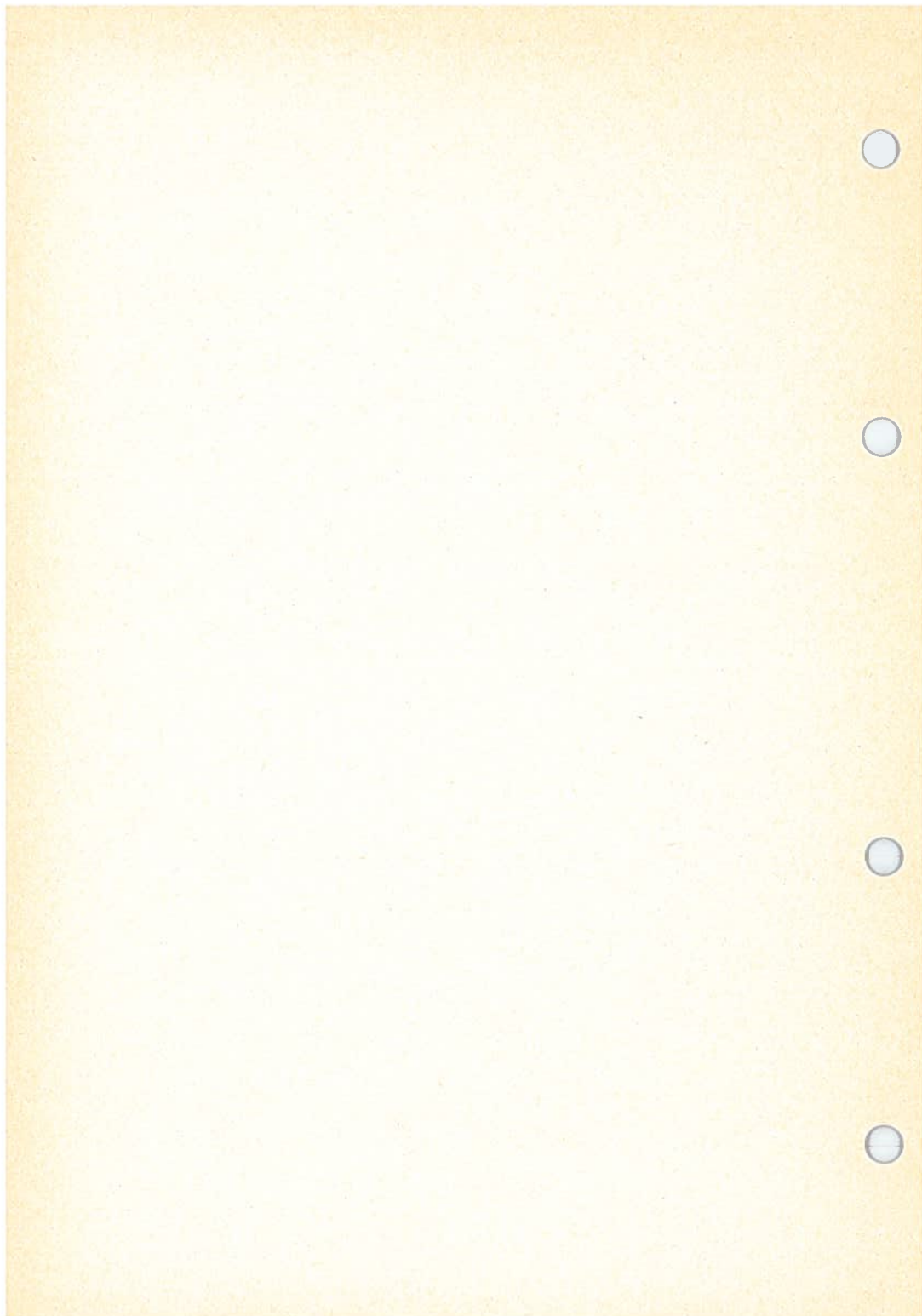
Measures proposed: None.

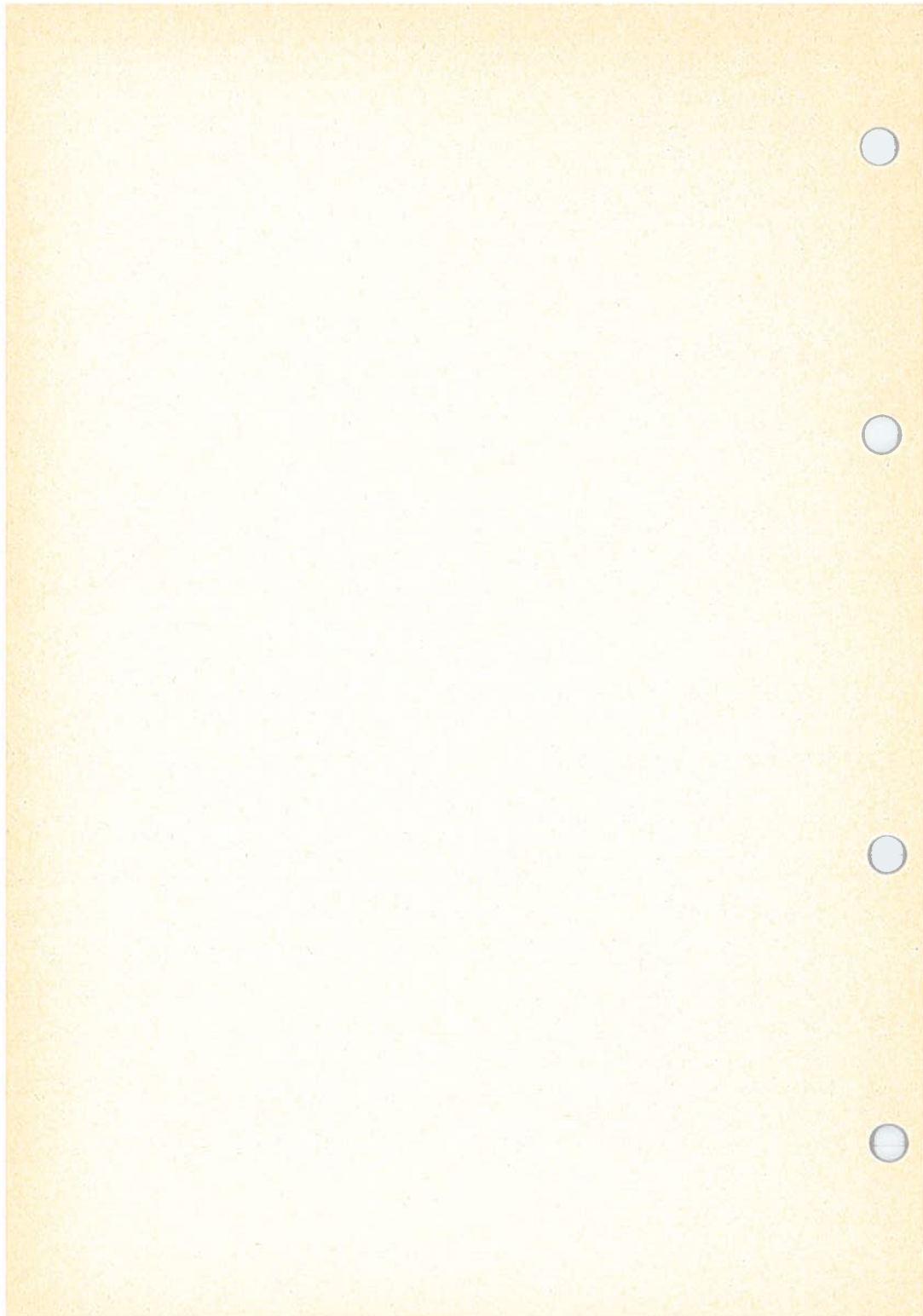
Number in captivity: None.

Breeding potential in captivity: "In general it is a difficult family to breed in captivity and losses of young may be high." (4)

References:

1. Marlow, 1958
2. Troughton, 1962
3. Lidicker, 1965
4. J. H. Calaby, in litt. 30/1/'63 to 21/6/'65





WESTERN NATIVE CAT

Dasyurus geoffroyi geoffroyi (Gould, 1841)

Order MARSUPIALIA

Family DASYURIDAE

Distinguishing characteristics: "Medium sized; olive-grey with white spots on body; distinguished from D. maculatus by unspotted tail and from D. quoll by black tail tip and presence of hallux; head and body 360-400 mm., tail 270-310 mm." (2:86)

Present distribution: "I doubt that this species survives in New South Wales or Queensland, but there may be a surviving remnant in central Australia." (4)

Former distribution: "The former range of this animal extended from Victoria and South Australia through New South Wales to Queensland but apparently did not include the coast region of the southeast or the extreme north." (1:35) "Recorded from only two localities in New South Wales, Liverpool Plains (31°20'S., 150°5'E.) (Gould, 1863) and at the junction of the Murray and Darling Rivers in 1867." (2:86)

Status: "Formerly widely distributed and plentiful over a large part, or possibly over the whole of the central area [of Central Australia] but now a rare and apparently vanishing form." (3:152) "Presumably extinct in New South Wales ... Brazenor (1950) states that it is extinct in Victoria." (2:86)

Estimated numbers:

Breeding rate in wild:

Reasons for decline: "The eastern subspecies has very likely suffered in the same way as the western, which was 'killed off as much as possible in the agricultural and more thickly populated districts on account of being so destructive to poultry' (Shortridge, 1910, pp. 838-839) ... Other possible causes underlying the sudden fluctuations in numbers of the species and its general disappearance over most of its range, have not been definitely explained." (1:35)

Protective measures already taken: None.

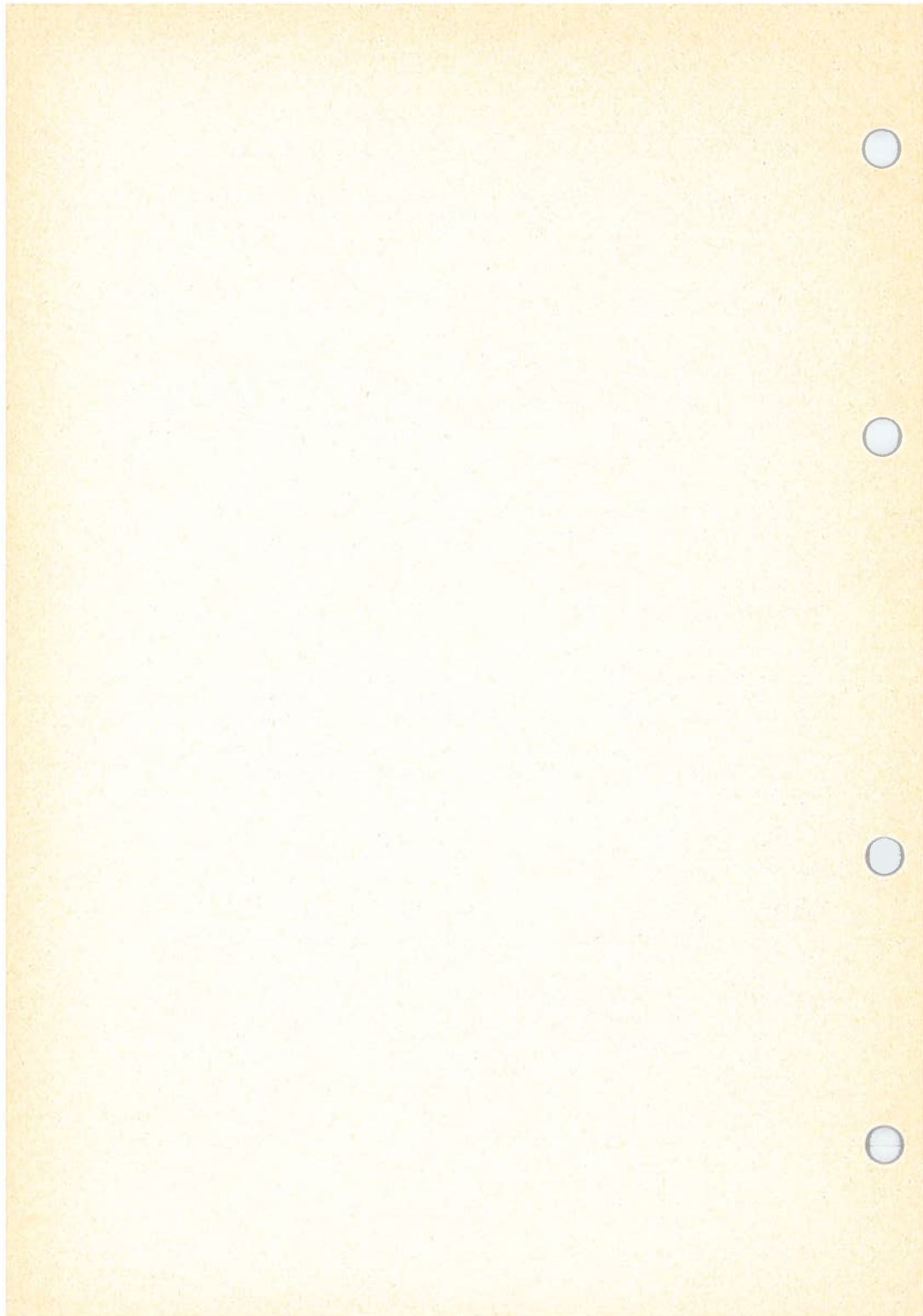
Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: "A difficult family to breed in captivity." (4)

References:

1. Harper, 1945
2. Marlow, 1958
3. Finlayson, 1961
4. J.H. Calaby in litt. 30/1/63 to 21/6/65



THYLACINE

Thylacinus cynocephalus (Harris, 1808)

Order MARSUPIALIA

Family DASYURIDAE

Distinguishing characteristics: Length of head and body 100 to 130 cm.; tail 50 to 65 cm. "The upper parts are tawny gray or yellowish brown, with 13 to 19 blackish-brown transverse bands across the back, rump, and base of the tail; the under parts are paler. The face is gray with some indistinct, white markings around the eyes and ears. The fur is short, dense, and coarse. ... The jaws are remarkable because of their very wide gape. Long canines, shearing premolars, and grinding molars show similarity with the dentition of the dog family. The general build is also dog-like, but the hind end tapers gradually, rather than abruptly, to the rigid tail. The feet, too, are somewhat dog-like, and, like the canids, these marsupials walk on their toes. The pads are granulated, not striated. The pouch is a crescent-shaped flap of skin enclosing the four mammae, and it opens to the rear." (7:45)

Present distribution: Reasonably reliable sightings have been made in widely scattered localities such as the Cardigan River on the Queenstown Highway, the far North West Coast, the Tooms Lake region and the Cradle Mountain - Lake St. Clair National Park [520 sq. miles]. They may also occur in Frenchman's Cap National Park [25,380 acres]. (9)

Former distribution: "The thylacine was once widely spread on the mainland of Australia (Gill, 1953) but in Recent times has become extinct on the continent and is now confined to Tasmania. It does not occur on the Bass Strait Islands and has never been recorded there in historic times." (6:207)

Status: "While, up to half a century ago, it was fairly plentiful in the grazing country of the central plateau [of Tasmania], and was known also to inhabit parts of the eastern tiers and other mountain forest areas adjacent to settlement, it has now practically disappeared from these districts, to make its last stand in the western section of the State." (2:36) Authentic reports of sightings appear to have become slightly more frequent in recent years. (9)

Estimated numbers: Unknown.

Breeding rate in wild: "Details of all aspects of reproduction ... are incomplete and based on hearsay rather than fact. It is known that three or four young are carried in the pouch but beyond this the literature is vague and contradictory ... it may be concluded that an extended breeding season of four months takes place, or else there are two periods of activity separated from each other by two months." (5:396-397)

Reasons for decline: "The mainland Thylacine is presumed to have succumbed as a consequence of the advent of the Dingo during the Pleistocene, for it probably could not compete successfully with that more highly organized animal." (3:40) "The damage which it inflicts on the flocks of the settlers has ... given rise to a relentless war of extermination, which has resulted in the almost complete extinction of this, the largest of the Australasian carnivores, in the more settled portions of the country." (1:152) From 1888 to 1909 the animal was subject to a Government bounty of £ 1 for each adult and Sh 10 for each sub-adult. Between 1888 and 1914, 2,268 thylacines were known to have been killed. "It must be emphasized that this total is

substantially below the number of thylacines killed." Disease may have been an important contributory factor since reports indicate a sudden, rapid decline about 1910 for which a disease such as distemper may have been responsible. "The importance of habitat alteration should not be disregarded in assessing the decline of the species but the view that hunting was the sole factor cannot be accepted." (6:208-210)

Protective measures already taken: "It is fully protected by law and there is an especially heavy penalty for killing it under any circumstances." (8) Early in 1966 approval was given to the proclamation of a game reserve of 1,600,000 acres in the vast South West of Tasmania, extending from Low Rocky Cape to Sprent to Kallista and thence to South West Cape, an area in which thylacine are known to occur. Cats, dogs and guns are now prohibited in the region. (9)

Measures proposed:

Number in captivity: None. "Many specimens were kept from time to time in zoos in Melbourne, Sydney and Hobart. The last one died in Hobart Zoo in 1933." (8) "The [London] Zoo has had at least a dozen Thylacines - the last having been purchased from Mr. C. Bruce Chapman on 26th January, 1926. This specimen died on 9th August, 1931." (4:88)

Breeding potential in captivity: "The thylacine has never bred in captivity." (8)

Remarks: "A very interesting fact about the Thylacine is that when hard pressed, or chasing a fast prey, it will often spring along on its hind legs, after the manner of a Kangaroo or Wallaby. This peculiarity was recorded as long ago as 1839, when the animal was quite common." (4:87)

- References:
1. Lydekker, 1894
 2. Sharland, 1939
 3. Harper, 1945
 4. Harman, 1949
 5. Guiler, 1961a
 6. Guiler, 1961b
 7. Walker, 1964
 8. J.H. Calaby in litt. 30/1/63
 9. Animals and Birds Protection Board, Hobart in litt. 13/9/65 and 14/1/66

RUSTY NUMBAT

Myrmecobius fasciatus rufus Wood Jones, 1923

Order MARSUPIALIA

Family DASYURIDAE

Distinguishing characteristics: "... the main body color is rich brick red [with] six or seven white bars between the mid-back and the base of the tail, producing an effect of transverse light and dark stripes. Numbats have a dark cheek stripe that runs through the eye, with the white line above and below. The body pelage is short and coarse, and both the head and hind-quarters are remarkably flattened above. The body is larger posteriorly than anteriorly. The tail is long, somewhat bushy, and non-prehensile. It is covered with long, stiff hairs which are sometimes bristly and form a brush. The snout is long and tapering, with a small mouth; the slender tongue can be extended for at least 100 mm. ..." (6:46)

Present distribution: "Probably still exists in inland western South Australia and the adjacent part of Western Australia." (?)

Former distribution: "Ranged from western New South Wales through South Australia to inland eastern Western Australia." (?)

Status: Extremely rare. The last specimen known to have been collected was taken in 1950 in the Warburton Ranges, Western Australia, (?) "near the common meeting point of the States of South Australia and Western Australia and the Northern Territory." (4:186) Presumed extinct in New South Wales. (3:87)

Estimated numbers: Unknown. Density is known to be low, even in ideal habitat. (4:188)

Breeding rate in wild: Referring to M.f.fasciatus, Calaby states that "it appears that the numbat has a definite breeding season, and that copulation must take place from mid-summer to early autumn (December to perhaps April) and the young are born in summer to autumn or early winter (January to April or May). The young are carried or nursed by the mother through the winter and some young at least are foraging on their own account in October. The only statement in the literature on the breeding of the numbat is Wood Jones' (1923) remark. 'The breeding season in Western Australia is in June and July, and four young constitute the normal litter.' ... pouch life is at least of four months duration, and the total nursing period probably as long as six months. This is a long pouch life and slow development when compared with marsupials of comparable size. ... The numbat's growth after detachment from the teat is probably rapid and it probably breeds in its first year." (4:200-201)

Reasons for decline: "The chief reasons that have been advanced for the decline include clearing of land, bush fires, and the introduced predators - domestic dog, cat, and particularly the fox ... It is [Calaby's] belief that the role of the predators in the numbat's decline has been much over-rated ... the fox is probably not important as it hunts mostly at night when the numbat is not active and is confined to its hollow-log shelters. Foxes and cats are abundant in all areas where the numbat [M.f. fasciatus which is not endangered] is still fairly common. Wild fires would certainly clear the numbat from the burnt area, but such fires are so rare nowadays in the woodland where the numbat lives as to be of little importance. Slow controlled burning, as it is performed in normal forestry practice, appears to be of little practical significance. It is done on small areas and mostly burns the sticks, grass, and litter and does not harm the trees or sound hollow logs. Numbats have been seen foraging on areas where sticks and animal dung were still smouldering. The termite populations in the soil are also largely unharmed by controlled burning of the woodland floor." (4:204-205)

Protective measures already taken: The entire known range of M.f. rufus is covered by the Woomera Rocket Range and some aboriginal reserves. Entry into these areas is very strictly controlled by the Security Authorities or the Aboriginal Welfare Departments. The animal is also protected by law. (7)

Measures proposed:

Number in captivity: None. (7)

Breeding potential in captivity: "Myrmecobius [but not this species] has been kept in captivity for short periods on three occasions, and would probably survive satisfactorily for indefinite periods providing that its natural food (termites) was given. No attempt has been made to breed it in captivity." (7)

- References:
1. Finlayson, 1933
 2. Tate, 1951
 3. Marlow, 1958
 4. Calaby, 1960
 5. Finlayson, 1961
 6. Walker, 1964
 7. J.H. Calaby in litt. 30/1/63 to 21/6/65

EASTERN BARRED-BANDICOOT

Perameles fasciata Gray, 1841

Order MARSUPIALIA

Family PERAMELIDAE

Distinguishing characteristics: "... a body length of about 12 inches. It is more slenderly built than the other bandicoots, and its soft fur is not spiny. It is grizzled, yellowish-brown on the upper surface, with four rather ill-defined dark stripes on each flank." (1:32) "Similar to P. nasuta except for dark transverse bars on orange-brown rump; head and body 216-222 mm., tail 106-108 mm." (2:88)

Present distribution: "Many authorities claim that it probably still exists in western Victoria. It seems clear however that the species never occurred in Victoria, at least in historical times, and the alleged Victorian specimens are misidentified Perameles gunnii." (4)

Former distribution: "Western slopes and plains of the Great Dividing Range", New South Wales, where according to Krefft (1866) it was formerly common. (2:88)

Status: There does not appear to be any definite record since 1867 and the species is probably extinct. (2:88)

Estimated numbers: Unknown.

Breeding rate in wild: "During the months of May to August females having eight teats were caught by the natives with from two to four young." (3:68)

Reasons for decline:

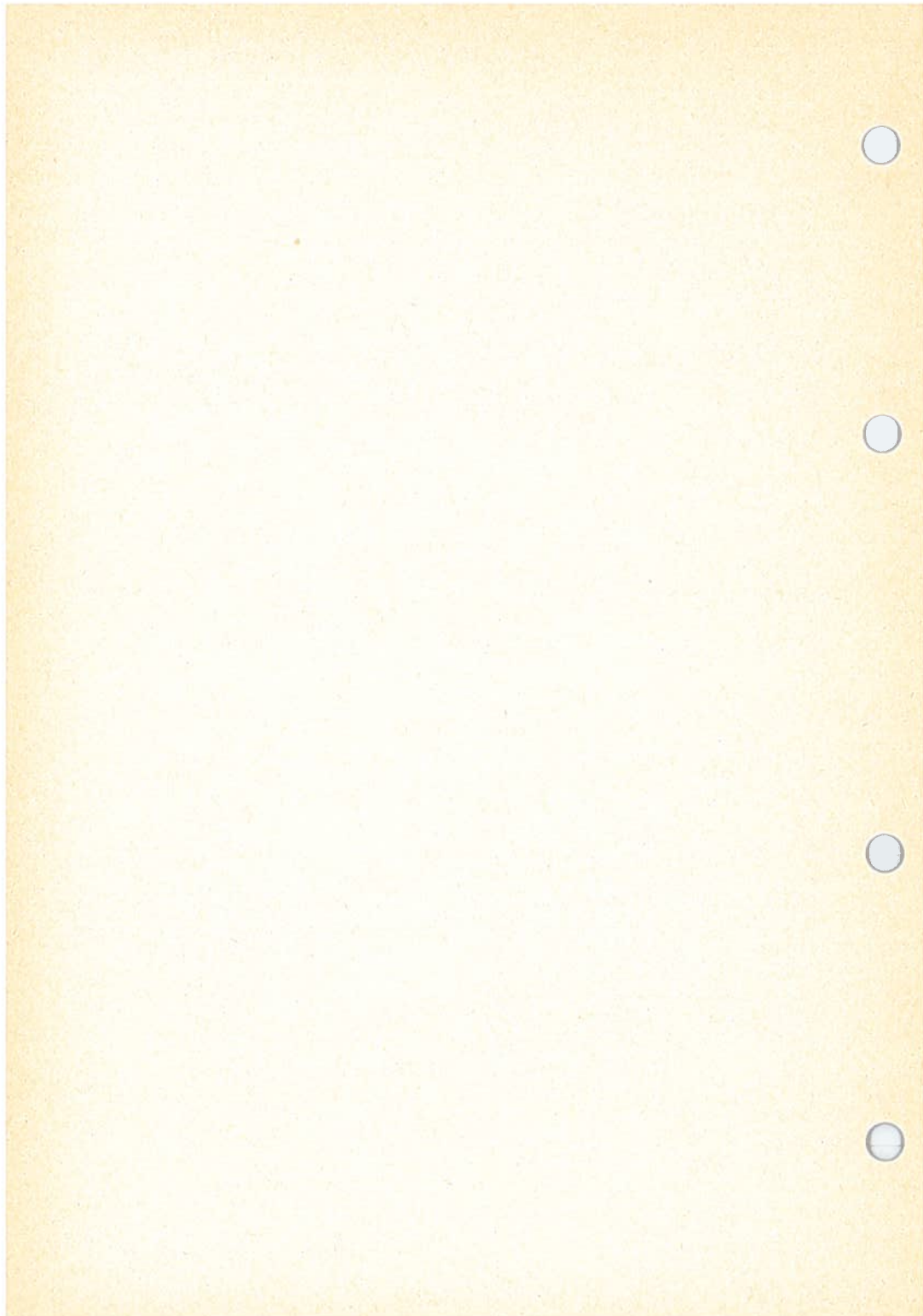
Protective measures already taken: None.

Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: "Bandicoots will mate and produce young in captivity fairly readily but the young appear to be eaten by the mothers. Bandicoots resemble many dasyurids in that they are solitary animals and are aggressive towards their own kind, irrespective of sex, and readily kill each other in captivity." (4)

- References:
1. Brazenor, 1950
 2. Marlow, 1958
 3. Troughton, 1962
 4. J. H. Calaby, in litt. 30/1/63 to 21/6/65



WESTERN BARRED-BANDICOOT

Perameles bougainvillei Quoy & Gaimard, 1824

Order MARSUPIALIA

Family PERAMELIDAE

Distinguishing characteristics: "This is the smallest of the barred bandicoots and is said to be even less distinctly marked than the south-western race of myosura." (1:69)

Present distribution: P.b. bougainvillei is known with certainty only from Bernier and Dorre Islands. (3) "Today, it seems that the species is confined to the islands of Shark Bay, but a proper search of Peron Peninsula has not been made in recent times." (2:69)

Former distribution: "Formerly occurred from Onslow, northwestern Australia, through southwestern Australia (P.b. myosura) across into southern South Australia (P.b. notina)." (3)

Status: "P.b. bougainvillei is abundant at the present time on Bernier and Dorre Islands, Shark Bay, Western Australia. P.b. myosura is apparently extinct and has not been collected since 1906. There are also no recent records of P.b. notina." (3)

Estimated numbers: No data. "The populations on Bernier and Dorre Islands appear to fluctuate in numbers." (3)

Breeding rate in wild: "The females have four teats in the pouch and in the female carrying two very young joeys the unoccupied pair of teats were elongated. One is tempted to think that this indicates loss of a previous litter, perhaps jettisoned when the mother was frightened, and then development of a second litter, possibly from quiescent blastocysts as described for macropods and the pigmy possum Cercaetus concinnus (Bowley, 1938)." (2:70)

Reasons for decline:

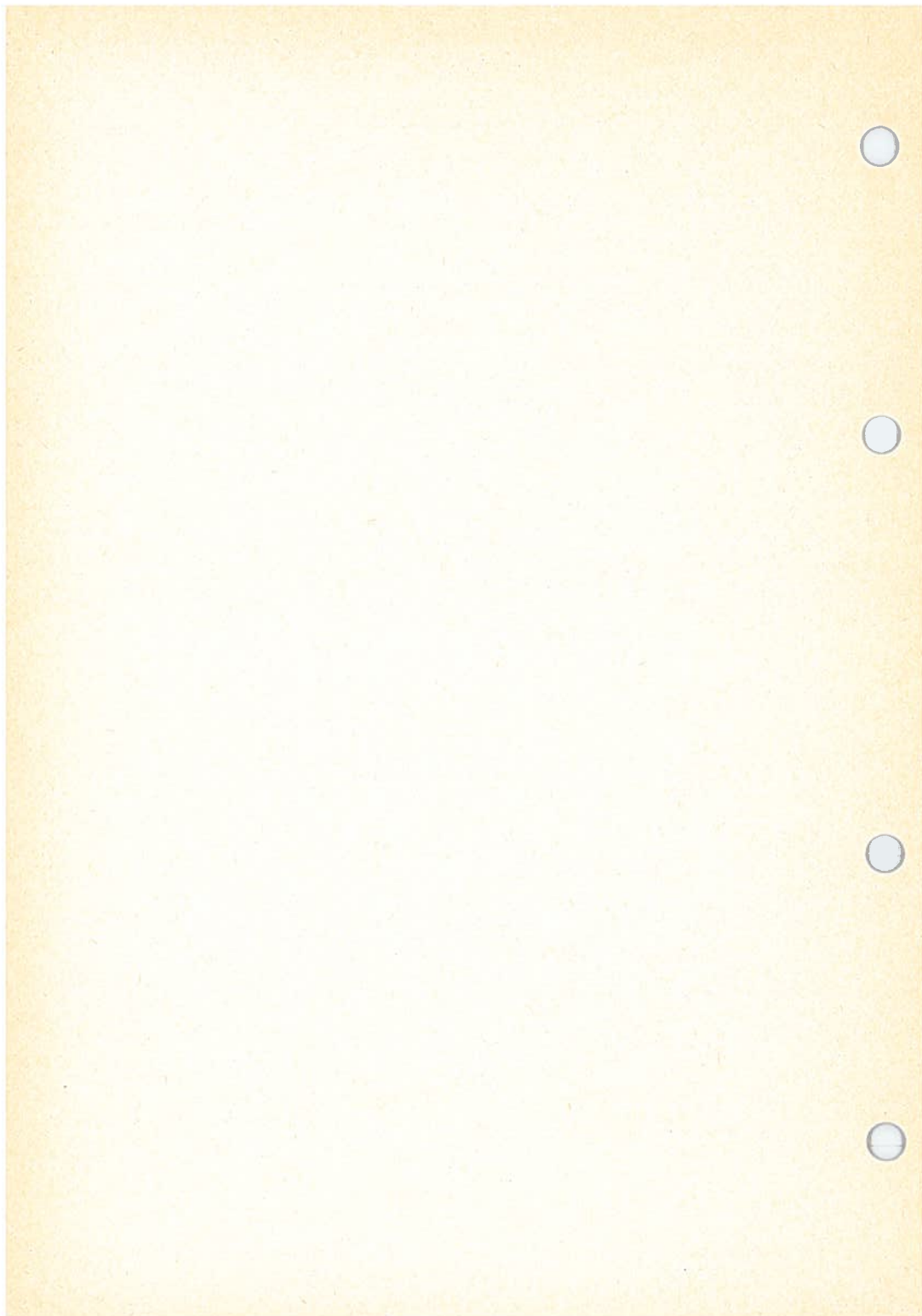
Protective measures already taken: "Bernier and Dorre Islands are "A" Class reserves for the preservation of fauna." (3)

Measures proposed:

Number in captivity: None.

Breeding potential in captivity: "Wood Jones bred P.b. notina but gave few details and it is not clear whether he reared the young to adulthood. ... Bandicoots will mate and produce young in captivity fairly readily but the young appear to be eaten by the mothers. Bandicoots resemble many dasyurids in that they are solitary animals and are aggressive towards their own kind, irrespective of sex, and readily kill each other in captivity." (3)

- References:
1. Troughton, 1962
 2. Ride & Tyndale-Biscoe, 1962
 3. J. H. Calaby, in litt. 13/3/63 & 21/6/65



RABBIT BANDICOOT

Macrotis lagotis (Reid, 1837)

Order MARSUPIALIA

Family PERAMELIDAE

Distinguishing characteristics: "Cat-sized; fawn-grey head and body, pure white belly; proximal third of tail fawn-grey, central third black, and distal third white with pronounced white crest; ears long and rabbit-like; hallux absent; head and body 400-440 mm.; tail, 205 mm." (3:89)

Present distribution: "At the present time isolated colonies occur in Western Australia, Northern Territory and south-western Queensland. It is probable that colonies still exist in the arid northern part of South Australia." (4)

Former distribution: "The species formerly occurred over the greater part of Western Australia, Central Australia, South Australia, south-western Queensland and western New South Wales." (4)

Status: "The several subspecies of this Australian animal (lagotis, cambrica, grandis, interjecta, nigripes, and sagitta) seem to be more or less seriously reduced in numbers; one is apparently on the verge of extinction, and another quite extinct." (2:51) In New South Wales the most recent record is 1912. (3:89)

Estimated numbers: Unknown.

Breeding rate in wild: "Troughton remarks (1932, p. 221): 'According to Wood Jones, one or two constitutes the usual litter [in members of this genus], although there are eight teats, and it seems possible that a reduced rate of breeding, in the less hospitable regions to which settlement is forcing them, ... must ultimately lead to the extinction of this harmless, picturesque, and pest-destroying marsupial.'" (2:51)

Reasons for decline: "The reason for the rapid decrease in numbers of the Bilby is not quite obvious. Certainly these useful animals have been ruthlessly slaughtered in all districts within reach of the more settled areas. Their pelts have been marketed in the skin sales in Adelaide in very large numbers; and they have been more wantonly killed for "sport". Large numbers have been killed or maimed in steel traps set for rabbits, and possibly many have fallen victims to poison baits. ... But in the Centre, where the fox is still absent, or rare, and where the Bilby is but little molested by man, it seems that some other factor must be invoked; and this is probably the extraordinary abundance of rabbits, and the consequent struggle for breeding burrows." (1:164-67)

Protective measures already taken: The species is legally protected. (4)

Measures proposed: None.

Number in captivity: No data.

Breeding potential in captivity: "In captivity the species survives well but has never bred." (4)

- References:
1. Wood Jones, 1923-25
 2. Harper, 1945
 3. Marlow, 1958
 4. J. H. Calaby, in litt. 30/1/63

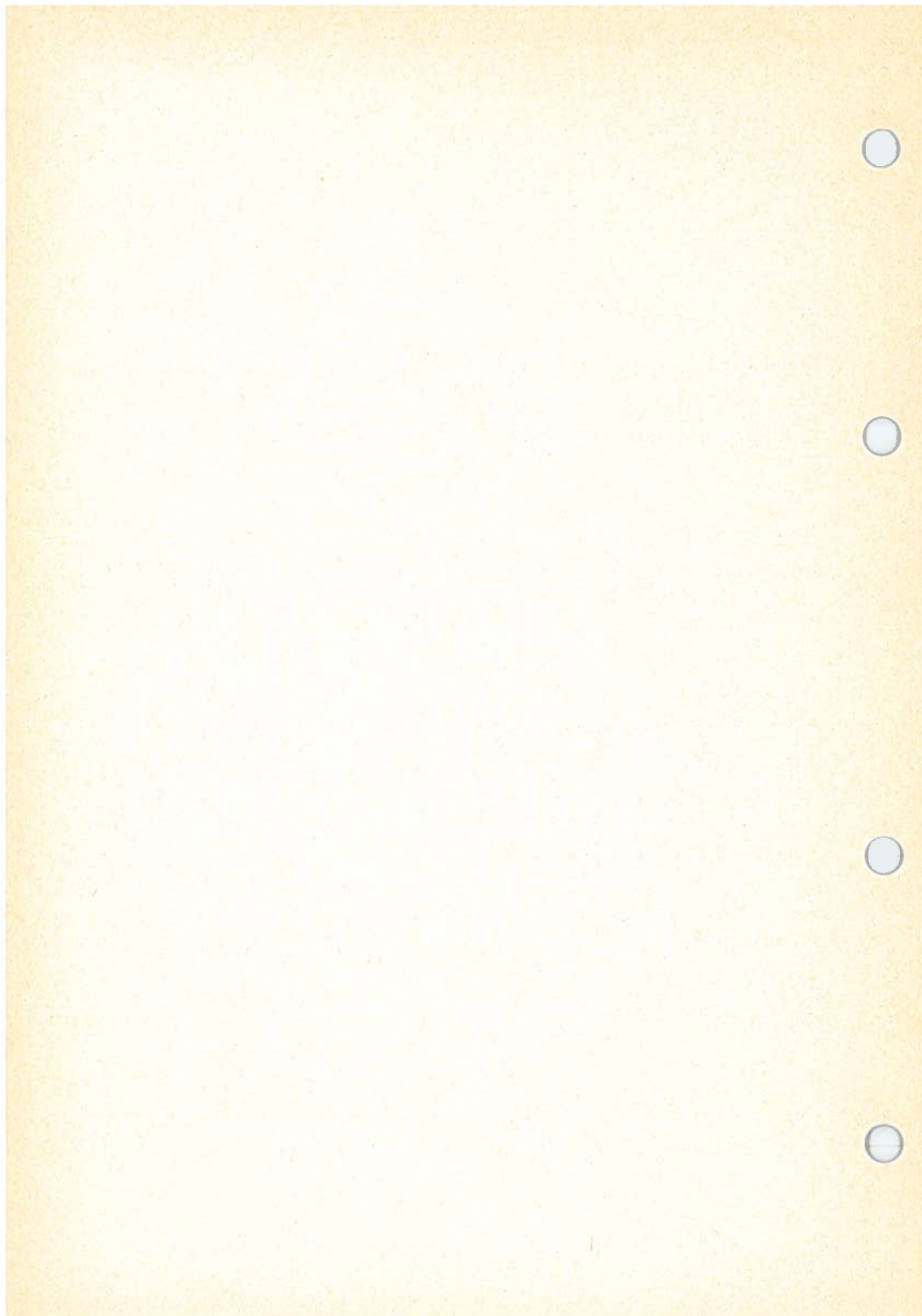


FIG-FOOTED BANDICOOT

Chaeropus ecaudatus (Ogilby, 1838)

Order MARSUPIALIA

Family PERAMELIDAE

Distinguishing characteristics: "Rat-sized; dorsal surface grey tinged with fawn, belly white, ears long and narrow, tail black with crest of short black hairs; only second and third digits of manus fully developed and fourth digit of the pes, hallux absent; head and body 250 mm., tail 100 mm." (4:89) "The western subspecies differs from the eastern one chiefly in its orange-brown rather than grey coloration." (3:59)

Present distribution: "One or other of the two subspecies may still maintain a slight foothold in Central Australia." (3:58)

Former distribution: In New South Wales it was "recorded only from the junction of the Murray and Darling Rivers, and the junction of the Murray and Murrumbidgee Rivers ... also occurred in South Australia, Western Australia, and the Northern Territory." (4:89)

Status: "Since the most recent specimen was collected in 1880 ... it is presumably extinct in New South Wales. ... Appears to have been always rare." (4:89) "If the animal still exists [in Central Australia] it must now be excessively rare." (5:160)

Estimated numbers: Unknown.

Breeding rate in wild: "Young in the pouch never exceed two, and the breeding season was estimated to be in May or June." (6:77)

Reasons for decline: Various reasons have been advanced for the decline of this species. Lydekker believed that it was due to grazing and trampling caused by increasing numbers of cattle and sheep. (1:148) Troughton considered that it was a victim of bush-fires and settlement (6:78); Wood Jones stated that its fate was sealed by the introduction of the fox. (2:171) However, none of these statements is supported by any evidence. (7)

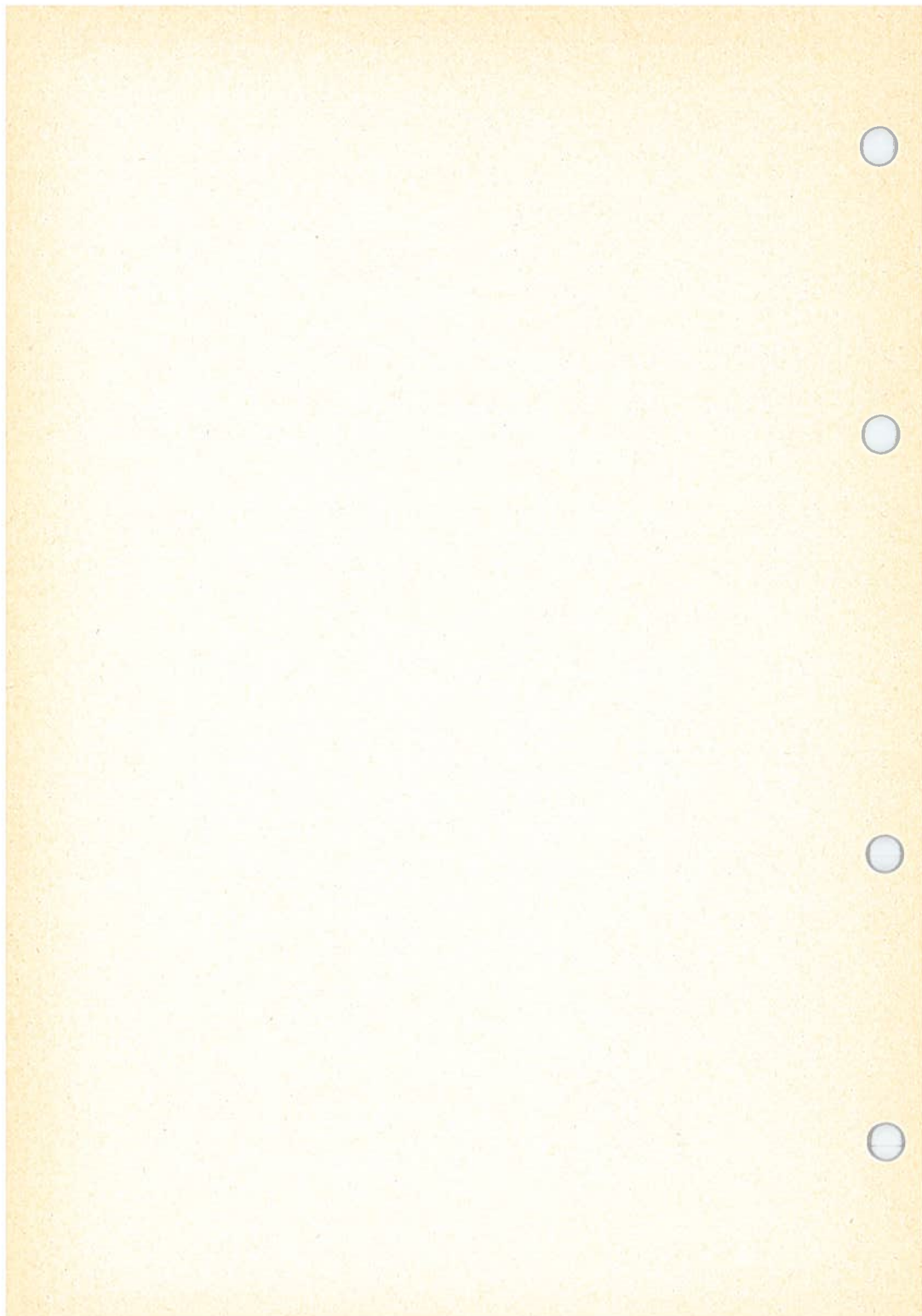
Protective measures already taken: None.

Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity:

- References:
1. Lydekker, 1894
 2. Wood Jones, 1923-35
 3. Harper, 1945
 4. Marlow, 1958
 5. Finlayson, 1961
 6. Troughton, 1962
 7. J. H. Calaby, in litt. 30/1/'63 to 21/6/'65



GREY CUSCUS

Phalanger orientalis peninsulae Tate, 1945

Order MARSUPIALIA

Family PHALANGERIDAE

Distinguishing characteristics: "General color light grayish brown, the bases of the hairs whitish, the rump and legs paler, approximately drab. Dorsal line from between ears to lumbar region fuscous. Underparts dirty white. Skull with general characters of the other races of orientalis but skull and teeth considerably smaller." (1:3) "The coloring is found to be rather variable, as suggested by the type and paratype. Females are fairly uniform dark gray-brown. Males may be dark, or quite pale ashy brown. Their under parts are pale, often curiously mottled with a slightly darker tint." (2:585)

Present distribution: "It is known from the rainforests of the Iron Range and McIlwraith Range of Cape York Peninsula." (4)

Former distribution: Unknown. "I described it originally from two specimens collected at Peach River by Darlington. We ourselves obtained more from the same place and others from the Iron Range farther north." (2:585)

Status: "This rainforest form may not be particularly rare although its geographical limits are rather restricted." (4)

Estimated numbers: Unknown. The type specimens were collected in 1932 and described in 1945. In 1948 Tate's party collected a further seven specimens. (3)

Breeding rate in wild: "Nothing is known of its biology in Australia." (3)

Reasons for decline:

Protective measures already taken: None.

Measures proposed: None.

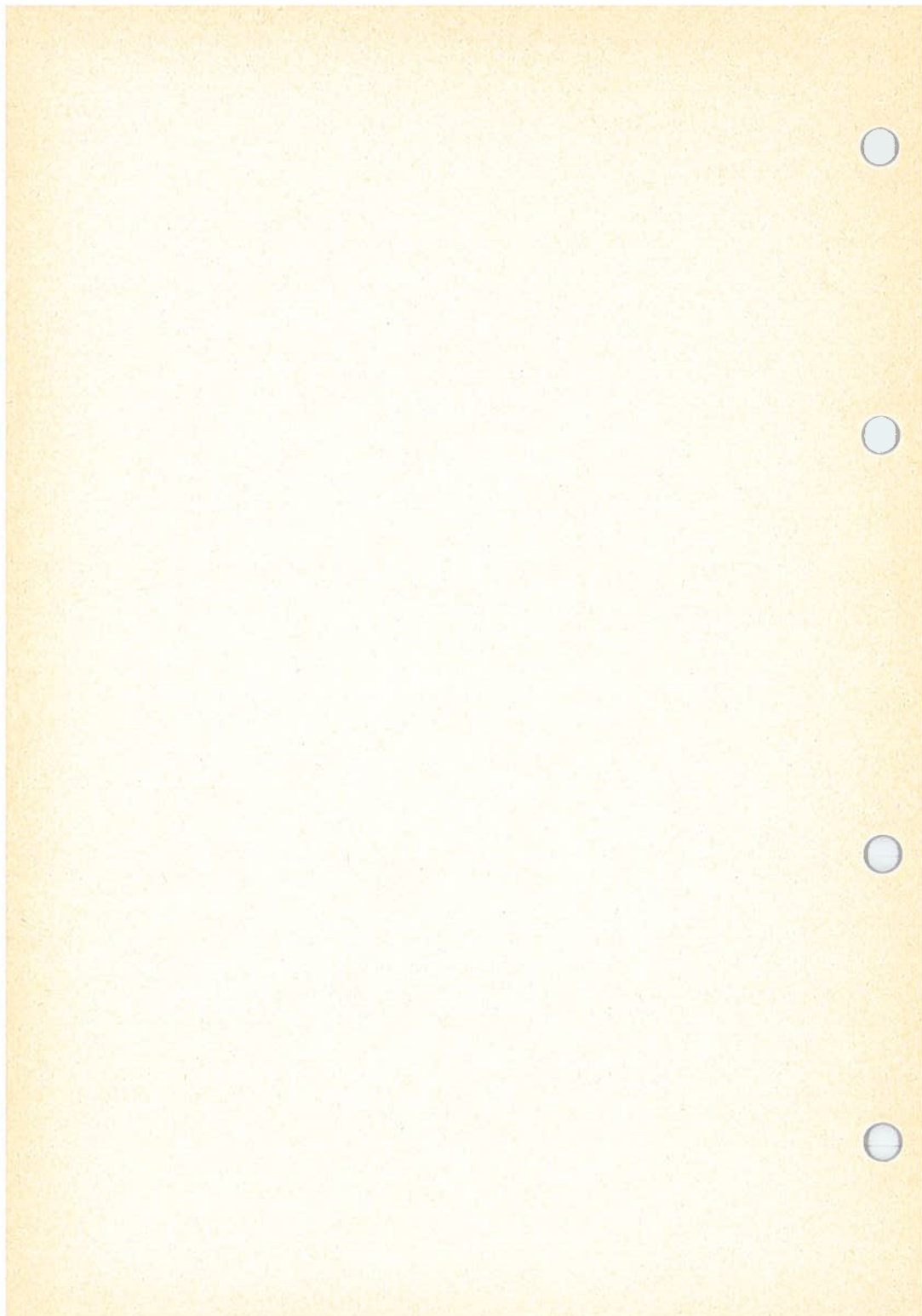
Number in captivity: None.

Breeding potential in captivity: Unknown.

Remarks: "Other subspecies of this cuscus are widely distributed in the islands to the north of Australia from the Moluccas, New Guinea and adjacent islands, eastwards to San Christoval in the Solomons." (3:131)

References:

1. Tate, 1945
2. Tate, 1952
3. Troughton, 1962
3. J. H. Calaby in litt. 30/1/63



LEADBEATER'S POSSUM

Gymnobelideus leadbeateri M'Coy, 1867

Order MARSUPIALIA

Family PHALANGERIDAE

Distinguishing characteristics: "The sexes are equal in size. The length of the head and body of four recent specimens is 152 to 168 mm., and the length of the tail is 190 to 199 mm. The fur is soft, but neither as long nor as silky as in Petaurus. The upper parts are gray or brownish gray, with a dark, mid-dorsal stripe that extends from the forehead to the base of the tail. The fur of the ventral surface and the inner surface of the limbs is a dull creamy yellow at the tips, and light gray beneath. The markings about the ears and the eyes are very similar to those of the sugar glider Petaurus." (4:70)

Present distribution: Known from only four localities in Victoria. (a) Tommy's Bend, 6 miles east of Marysville, alt. 3,200 ft. (1961): (b) Cumberland Valley, 11 miles east of Marysville (April, 1961): (c) slopes of Ben Cairn, 8 miles E.S.E. of Healesville, alt. 3,000 ft., in Shining Gum, Eucalyptus nitens, (July, 1962): (d) Black's Spur Road, northeast of Healesville, in Mountain Ash, Eucalyptus regnans, (October, 1962). (3:1) "On March 11th 1963 a dead female was found at Warbuton, Victoria (37°46'S., 145°41'E.). On March 16th Mr. E. Wilkinson visited the locality and observed a live specimen at Cement Creek, about 5 miles north of Warbuton." (5)

Former distribution: Type specimens found in the vicinity of the Bass River valley, South Gippsland, Victoria (1867). Further specimens were obtained from Mount Wills (1909); Koo-Wee-Rup swamp near Tynong (1910). The few locality records appear to indicate a wide former range in Victoria. (2:530-531)

Status: Until recently regarded as extinct. In 1961 a small colony was re-discovered by Mr. H.E. Wilkinson in the Cumberland Valley area. (2:531) "The increasing number of locality records of this species supports my contention that it has built up in numbers and has spread from refuge areas left untouched in the devastating bushfires of 1939." (5)

Estimated numbers: Impossible to estimate. At present Gymnobelideus is known from one undefined colony by four specimens and numerous sightings in an area approximately 100 miles square, and three additional sightings in three other areas. (3:13)

Breeding rate in wild: Believed to nest in hollow trees: mating is thought to occur about September in the Tommy's Bend area but probably varies according to environment: gestation period is probably 2 - 3 weeks: no data on duration of pouch life: four mammae: the usual number of young is thought to be two. (3:8)

Reasons for decline: "When considering the possible reasons for the decline of Leadbeater's possum it must be remembered that it was rare by the time it was discovered in 1867, only thirty-three years after the first successful settlement in Victoria was established. Suggestions that

predation by the introduced cat or that bushfires caused by Man were responsible for the rarity of the species are not acceptable. The reasons are much more fundamental. ... Extensive changes in the climate and flora occurred in the Pliocene and Pleistocene and the concurrent alterations of ecological conditions provided many new opportunities for faunal change. During this period the dense conifer-beech forests of the Tertiary gave way to a Eucalyptus - Acacia association which was better suited to the new conditions. The more open nature of the eucalypt dominated forests was probably a telling factor in the evolution and spread of the volant marsupials. ... In contrast to [certain other] pairs of allied genera, Gymnobelideus and Petaurus have not diverged in habit yet still occur sympatrically. This has resulted in competition for the ecological niche which both species G. leadbeateri and P. breviceps, appear to occupy. ... [and] the glider appears to have been highly successful. It is significant that only in areas of particularly dense forest is the possum able to hold its own. The gliding membrane of P. breviceps is of no advantage under these conditions." (3:14-15)

Protective measures already taken: "The species is fully protected by Victorian legislation, under the Game Act 1958 (No. 6258) ... A study of the species has been undertaken by the Fisheries and Wildlife Department ... The precise locations of the colony and recent sightings are being withheld from the public to guard against disturbance." (3:16)

Measures proposed: The future of the thriving colony at Tommy's Bend is dependent on the preservation of the habitat. Part of the area is designated Permanent State Forest under the control of the Forests Commission of Victoria and part is specifically reserved intact as a catchment area by the Melbourne and Metropolitan Board of Works, and is virtually inviolate. It is considered unlikely that any interference will occur in this area for some years to come. By then it is anticipated that there will be sufficient data concerning the possum to enable strong recommendations for the preservation of the whole area to be made. (3:16)

Number in captivity: 2 males and 1 female have been captured and are maintained in the Wildlife Laboratory for observation and breeding studies and in the hope of establishing a breeding colony. (3:16-17)

Breeding potential in captivity: Unknown.

References:

1. Wakefield, 1960
2. Brazenor, 1962
3. Warneke, 1963
4. Walker, 1964
5. R.M. Warneke in litt. 10/5/63

SCALY-TAILED POSSUM

Wyulda squamicaudata Alexander, 1919

Order MARSUPIALIA

Family PHALANGERIDAE

Distinguishing characteristics: In the adult female described by Calaby "the hair is short, soft, fine, and dense. ... The general dorsal color is pale grey but the black tips to the longer hairs give it a somewhat darker and mottled appearance. ... A fairly well defined dark stripe on the mid-dorsal line runs from the shoulders to the rump. The sides are paler than the back and the sides of the face are a pale grey. The demarcation from the grey sides to the ventral fur is not very abrupt. Ventrally the fur is a creamy white, slightly yellowish in places, particularly under the throat and inside the fore-limbs ..." (1:187) "The tail is densely furred at the base and has non-overlapping thick scales for the remainder of its length. Short bristly hairs are present around the scales. This is the only member of the family Phalangeridae with a tail of this type. The head is short and wide. The claws are short and not strongly curved." (2:74)

Present distribution: "All known specimens have come from the Kimberley Division of Western Australia, the two furthest localities being approximately 300 miles apart." (3) "The type, a female, was described by Alexander in 1919. It ... came originally from Violet Valley Station. The second specimen, a male, was collected at Kunmunya Mission by the Rev. J.R.B. Love, and described by Finlayson in 1942 ..." Two further specimens, a female and pouch young, recorded and described by Calaby, were collected by Mr. K. Buller at Wotjulum Mission on June 30, 1954. (1:186-187)

Former distribution: Unknown.

Status: The species is known only from the three adult specimens and single pouch young mentioned above. None has been seen since 1954. (3) "The animal is apparently excessively rare at Wotjulum. Only the old aborigines had seen the species previously. Mr. Buller spent about a month in the area in June and July, 1954, but saw only this one, and although large monetary rewards were offered to the aborigines for another specimen, none was obtained. Mr. A.M. Douglas spent five weeks in the area in September and October, 1955, and also offered substantial rewards, but without result. He personally searched for many hours at night in every type of habitat and camped out often, but did not see the animal." (1:191)

Estimated numbers: Unknown.

Breeding rate in wild: Unknown. The female described by Calaby had a single pouch young. (1:186)

Reasons for decline:

Protective measures already taken: Fully protected by law. (3)

Measures proposed:

Number in captivity: None.

Breeding potential in captivity: Unknown.

Remarks: "Mr Buller asked several old Worora independently for the native name and all knew it as "Illungalya". The old people stated that the animal lived deep in rocks during the day and came out at night to feed on the bloodwood flats. They said it left the rocks and climbed the nearest tree, and then crossed from tree to tree without coming to the ground. It always returned to its home in the rocks well before dawn." (1:191)

References: 1. Calaby, 1957
 2. Walker, 1964
 3. J. H. Calaby, in litt. 30/1/63

WESTERN RING-TAIL

Pseudocheirus occidentalis (Thomas, 1888)

Order MARSUPIALIA

Family PHALANGERIDAE

Distinguishing characteristics: "Color above deep smoky gray; limbs like back, but hands and feet darker; under parts white; basal part of tail dark brown, terminal two-fifths white, naked part below tip smooth. Head and body, 335 mm.; tail, 310 mm. (Thomas, 1888, pp. 174-175)." (2:63)

Present distribution: "The species is now restricted to the lower region of south Western Australia where it occurs in small isolated colonies, chiefly on the banks of rivers and the edges of swamps." (3:112)

Former distribution: Harper cites records which "suggest that the animal was practically confined to the South-West Division of Western Australia, from Perth southward." (2:63-64)

Status: Extremely rare. Troughton "suggests that it is now on the verge of extinction." (3:112) Calaby considers that "it will probably continue to survive." (4)

Estimated numbers: Unknown.

Breeding rate in wild: No data. Probably similar to the related species, P. laniginosus which, according to Wood Jones, "breed only once a year, and two young are produced at a time." (1:179) "Four nipples are present, but only the posterior pair is fully developed and functional." (1:177)

Reasons for decline: "... another instance of an interesting native animal nearing extinction as the result of settlement; the habit of living on the ground must have helped in the reduction." (3:113)

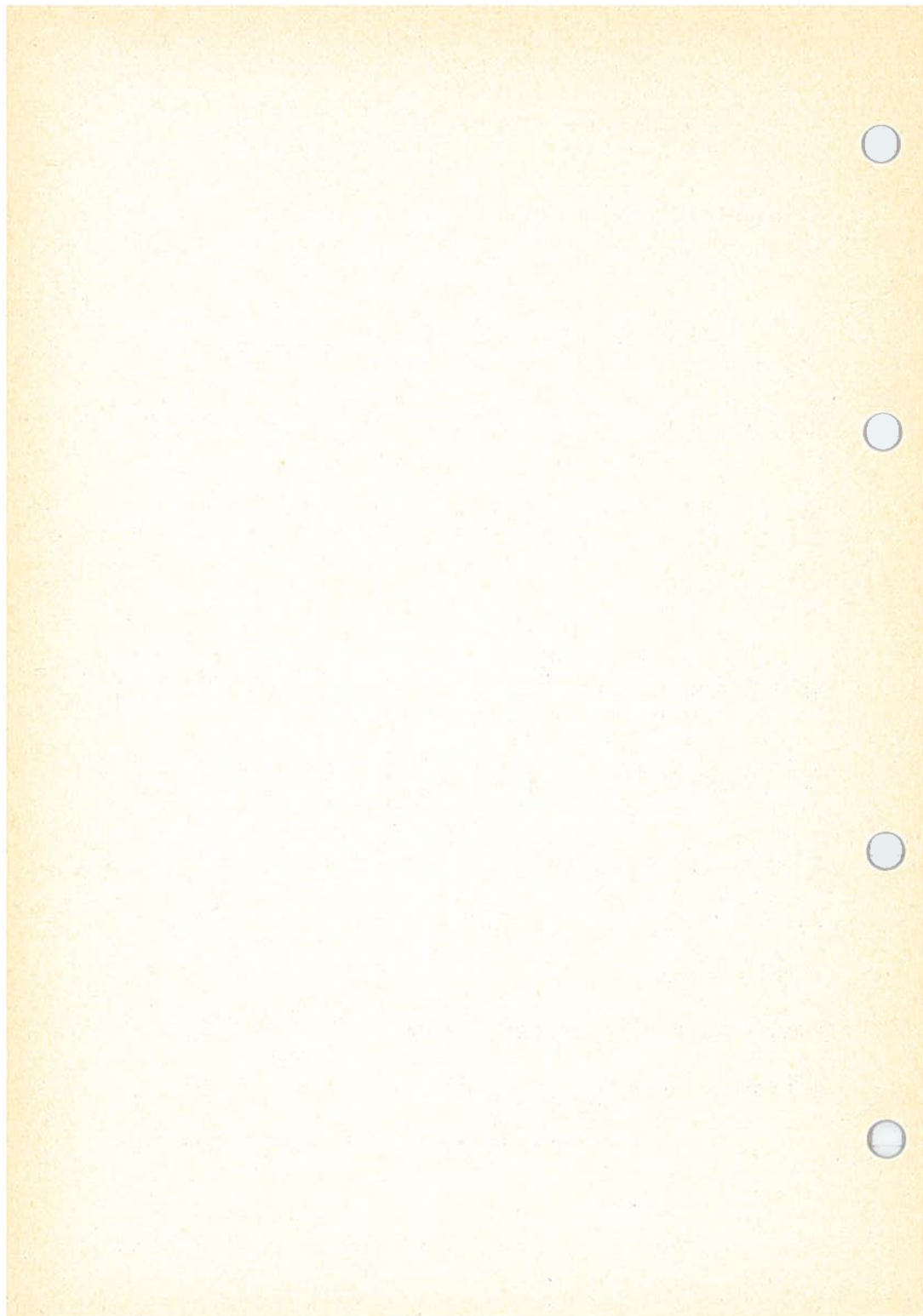
Protective measures already taken: "Fully protected by law." (4)

Measures proposed: None.

Number in captivity:

Breeding potential in captivity: "Does not breed readily in captivity." (4)

- References:
1. Wood Jones, 1923-25
 2. Harper, 1945
 3. Troughton, 1962
 4. J.H. Calaby in litt. 30/1/63 to 21/6/65



FLINDERS ISLAND WOMBAT

Vombatus ursinus ursinus (Shaw, 1800)

Order MARSUPIALIA

Family VOMBATIDAE

Distinguishing characteristics: "This is the smallest of the Wombats; hair coarse, varying from light sandy brown to blackish; rhinarium naked. Head and body, 775 mm. Weight, 25-30 pounds (Spencer and Kershaw, 1910, p.29)." (1:72)

Present distribution: "Colonies exist on Flinders Island. ... I doubt that this race occurs in Tasmania. If any were liberated there they have probably disappeared or lost their identity by interbreeding with P.u. tasmaniensis." (4)

Former distribution: "Formerly an inhabitant of several of the larger islands of Bass Strait ..." (1:72) including Clarke, King, Deal and Flinders. (2:5)

Status: "It is extinct on all islands except Flinders ..." (2:5) Calaby considers that the Flinders Island colonies "will probably continue to survive." (4)

Estimated numbers:

Breeding rate in wild: "The pouch contains two teats and opens posteriorly. The normal litter size is one." (3:82)

Reasons for decline: "The island wombats declined and became extinct on all but Flinders Island partly through killing (for food or for other reasons) and partly through clearing and habitat alteration." (4)

Protective measures already taken:

Measures proposed:

Number in captivity:

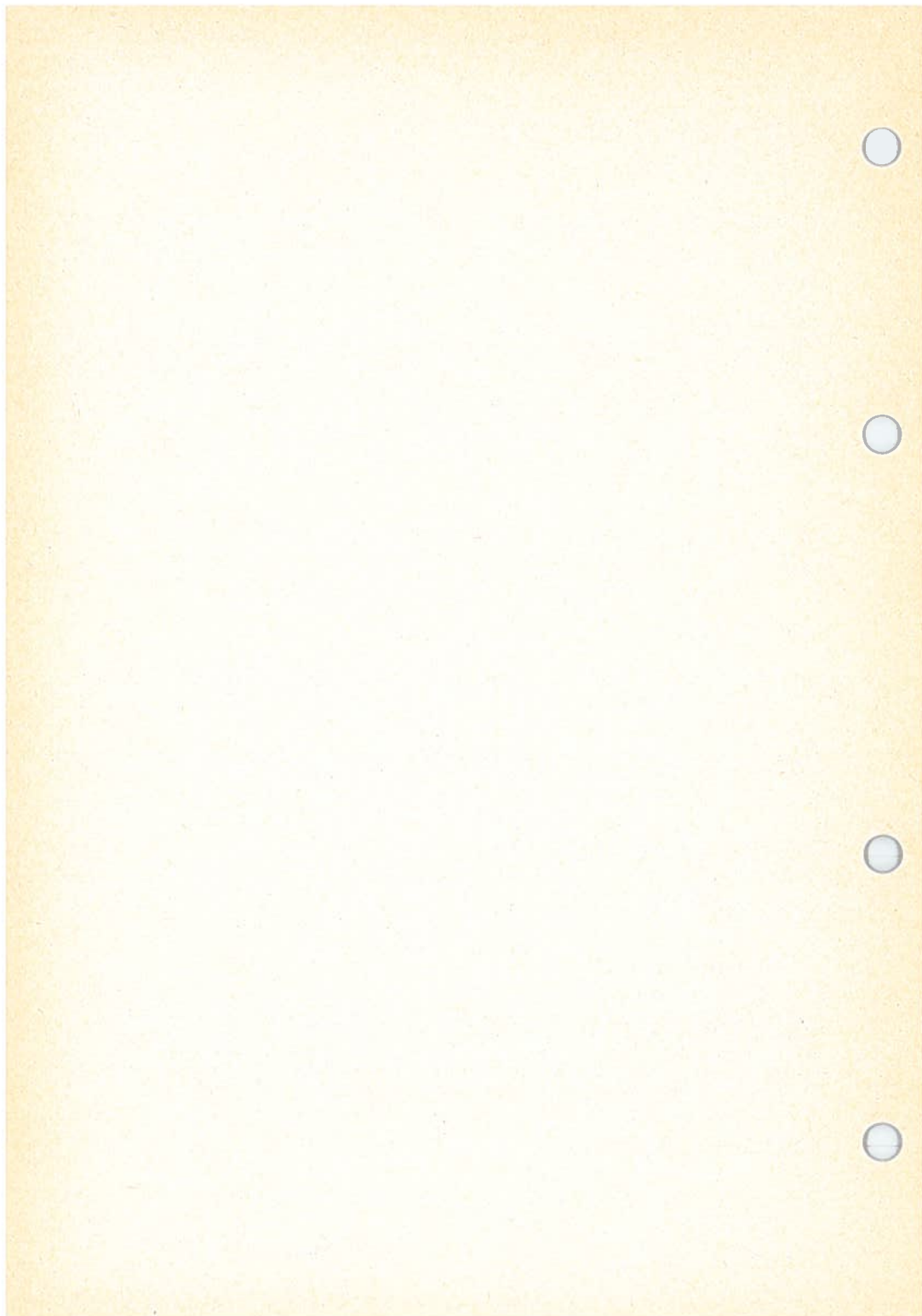
Breeding potential in captivity: "There seems to be no difficulty in keeping wombats in captivity and most large zoos in Australia and abroad have specimens of one form or another. They make good pets. However, they do not appear to breed readily in captivity and I know only one published record of a young born in captivity (London, 1858; Flower, 1929)." (4)

References:

1. Harper, 1945
2. Tate, 1951
3. Walker, 1964
4. J. H. Calaby, in litt. 30/1/63 to 21/6/65

Status category: 4(b)

Code number: MA/9/VOMBA/URS/URS



HAIRY-NOSED WOMBAT

Lasiorhinus latifrons latifrons (Owen, 1845)

Order MARSUPIALIA

Family VOMBATIDAE

Distinguishing characteristics: "Apart from the characteristic hairy muzzle to which the generic name refers, this animal is distinguished from the naked-nosed species by its softer, rather silky fur, and longer and more acutely pointed ears. The extraordinary breadth and shortness of the nasal region of the skull distinguishes it from both the Queensland hairy-nosed and the naked-nosed species. The general colour is described as grizzled-grey, but the animal is not so uniformly coloured as are the naked-nosed species. The size is also said to average somewhat smaller, the maximum total length recorded being just under 3 ft., as opposed to a maximum of 3 ft. 9 in." (4:148)

Present distribution: "Occurs at the present time on the Nullarbor Plain around the head of the Great Australian Bight and in scattered colonies eastward to the Murray River near Blanchetown. This is only a remnant of its former range." (7)

Former distribution: "From eastern Western Australia to western New South Wales. Other subspecies formerly occurred in limited areas in Queensland." (7) In New South Wales it has been "recorded from the Riverina only in the vicinity of Deniliquin (35°31'S., 144°58'E.)." (3:90)

Status: "It continues to survive in good numbers in its present range in spite of persecution." (7) "Presumably extinct in New South Wales since the most recent record is 1909." (3:90)

Estimated numbers: Unknown.

Breeding rate in wild: "The breeding season begins in April and usually continues through June. The marsupial pouch is well developed and opens to the front, as in the kangaroos, and there are two mammae. The single young normally remains in the pouch until December, when it is weaned. The sexes live apart until the arrival of the breeding season. Soon after mating, the females drive the males away again." (5:83)

Reasons for decline: "According to Le Souef and Burrell the species was at one time fairly plentiful in the Riverina but was killed out as part of the campaign against the rabbits which used the wombat burrows." (4:149)

Protective measures already taken: "It is not protected in most of this country and is persecuted as it is considered a pest because of the enormous burrows it digs and the large holes it digs under fences." Some years ago the Fauna and Flora Board attempted to acclimatise the wallaby on Kangaroo Island, but the experiment was unsuccessful and was abandoned. (7)

Measures proposed: "The wombat is an excessively powerful animal, its perfection of muscular development being one of the wonders of comparative anatomy. It is this extraordinary muscular power which enables it to dig its large tunnels into the very hardest sort of ground. It also possesses a good tough skin, and so it could probably hold its own under present day conditions, and with existing introduced enemies, if only it had adequate protection from man ... South Australia possesses vast tracts where wombats might burrow and live without detriment to any human enterprise. In these areas they need protection from man alone." (1:270)

Number in captivity: 8 ♂♂ and 4 ♀♀ in 6 zoos: (race not specified). (6:372)

Breeding potential in captivity: There are records of this animal having lived as a domestic pet, "but they do not appear to breed readily in captivity." (7)

- References:
1. Wood Jones, 1923-25
 2. Harper, 1945
 3. Marlow, 1958
 4. Troughton, 1962
 5. Walker, 1964
 6. Jarvis, 1965
 7. J.H. Calaby in litt. 30/1/63 to 21/6/65

WESTERN HARE-WALLABY

Lagorchestes hirsutus Gould, 1844

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "General color of fur, especially on hind quarters and under parts, rich sandy buff; head and back grizzled with grayish white; body beset, especially posteriorly, with numerous long, rich rufous hairs; space about eye reddish buff; ears large, grayish brown externally; feet yellowish buff. Total length, 698 mm.; tail, 266 mm. (Gould, 1844, p. 32)." (1:95)

Present distribution: "This species still survives but is rare on both Bernier and Dorre Islands, Shark Bay, Western Australia. These two island populations have been described as different subspecies, both differing somewhat from L.h. hirsutus. The species probably still survives in inland western South Australia and in the inland desert areas of Western Australia!" (6)

Former distribution: "Interior of Western Australia, and islands of Sharks Bay; long disappeared from the York district ... of the south-west where it was once abundant." (4:171) "It is not known with certainty whether it reached the Queensland border, and its southern limit in South Australian territory was never determined and is now indeterminable." (3:167)

Status: Tate states that the species is "virtually extinct." (2:279) "The mode of occurrence of this hare wallaby is fluctuating and discontinuous and with isolated colonies widely sundered - circumstances which always add to the difficulties of estimating status. But there seems no doubt that a major collapse in its numbers in the south-west has occurred in the last 25 years. In 1956 the testimony of natives who still hunt yearly in the sand tracts south of the Musgrave, Mann and Tomkinson Ranges (where it was one of their chief food supplies in 1932-35), was that it was "finished". It is certainly a comparatively rare animal in any part of Central Australia today, and in the districts where it lives sympatrically with L. conspicillatus, is much scarcer than that species." (3:168) "Lagorchestes hirsutus is rare today in Western Australia, but it has a wide distribution and was probably never very common anywhere. A series was obtained by Lipfert, during 1930 and 1931, on the Canning Stock Route between Wiluna and Halls Creek, and it certainly occurs in Central Australia. In 1906 this wallaby was plentiful on Bernier Island, and Shortridge obtained 24 specimens but we found that at present it is rare. More time was spent by the expedition searching for this animal than for Lagostrophus, and, even so, only two specimens were obtained, a male on Dorre Island and a female on Bernier." "The apparent rarity of the species at the present day is supported by the fact that of the 66 skulls of Macropodidae picked up on both Islands, only one was of Lagorchestes and that a juvenile." (5:62-63)

Estimated numbers: Unknown.

Breeding rate in wild: No data on breeding have been recorded in the literature.

Reasons for decline: "The decline of Lagorchestes since 1906 is the most significant change which emerges from the account, [of the insular races] and it is tempting to correlate this with the introduction of sheep and goats which first occurred around the turn of the century. But, as far as

we know, this occurred only on Bernier. However, the "crash" was only witnessed on Bernier and from Lipfert's results it was on Bernier that Lagorchestes suffered most. Shortridge considered that the "crash" was the normal result of high numbers but we are inclined to believe that it may have been the first effects of interference in the habitat by men. The populations were thinned out to some extent by the use of the Wallabies as a main article of food by aborigines between 1907 and 1918 but it seems unlikely that this would have compensated for the widespread destruction of their habitat by introduced mammals and fires. ... Lagostrophus and Lagorchestes seem to overlap in habits and food requirements more than either does with Bettongia, and it may be that interference with the island habitat has upset an 8,000-year balance between the two species in favour of Lagostrophus. Another factor which may have affected Lagorchestes on Bernier is the apparent absence of large areas of Triodia on this island." (5:89-90)

Protective measures already taken: Fully protected by law. (6) Bernier and Dorre Islands are a Class A Reserve. (5:3)

Measures proposed:

Number in captivity: None.

Breeding potential in captivity: Probably breeds as readily in captivity as other members of this family. (6)

Remarks: "Two island forms, bernieri Thomas and dorreae Thomas, respectively from the adjacent Bernier and Dorre Islands, have been recognized" (2:279) but these have been described as "doubtfully distinct." (1:96)

References:

1. Harper, 1945
2. Tate, 1948
3. Finlayson, 1961
4. Troughton, 1962
5. Ride & Tyndale-Biscoe, 1962
6. J. H. Calaby, in litt. 30/1/63 to 21/6/65

BANDED HARE-WALLABY

Lagostrophus fasciatus (Péron and Lesueur, 1807)

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "The animal is about the size of the Common Hare of Europe; fur very long and soft, brown-gray, variegated with rusty, black, and white; space about eye bright rusty; numerous narrow dark cross bands on the back, most conspicuous posteriorly; on the upper parts and sides are very long interspersed white hairs; under parts dirty white; hind feet with long, harsh, brownish-white hairs springing from sides of two larger toes. Head and body, 444 mm.; tail, 279-305 mm. (Waterhouse, 1846, vol. 1, pp. 87, 90)." (1:96-7)

Present distribution: Bernier and Dorre Islands (in Shark Bay) Western Australia. (5)

Former distribution: "It formerly had a wide distribution in south-western Australia but has not been certainly reported there since 1906." (5)

Status: "The species is probably extinct on the Australian mainland." (5)
"Our observations indicate that Bernier and Dorre possess large and stable populations of Lagostrophus; all mature females were breeding but there was no predominance of juveniles as there would be in a rapidly growing population, or one in which there is heavy predation of adults." (4:61)
"Lagostrophus appears to have suffered considerable fluctuations in number during our knowledge of the islands, but it has recovered from a well documented "crash" and appears to be secure under its present environmental conditions. It appears unlikely that these conditions will persist in the presence of the goat population on Bernier Island." (4:89)

Estimated numbers: No data.

Breeding rate in wild: A single pouch young. (3:170) "There is little indication of a breeding season since joeys of all ages were obtained by this and previous expeditions. There is a heavy mortality among juveniles (in part due to predation) and following this, death is rare until dental progression stage M3-4." (4:61) "Shortridge recorded that "in the case of Lagostrophus I have never seen any animal, not even rabbits, in such numbers ... they breed to such an extent that the island will carry no more." (4:88-9)

Reasons for decline: "The most curious part of the problems raised by the persistence of the three macropod species on Bernier and Dorre is that it is precisely the species which is rare on the islands (Lagorchestes) that persists on the mainland, whereas the two most successful island species are either possibly extinct (Lagostrophus) or exist in very diminished range and possibly close to extinction (Bettongia). Lagostrophus fasciatus was declining in South-west Australia when Shortridge collected it in 1906 near Pingelly and no other specimens have been recorded since. The clearing of scrub for agriculture, thus destroying the main habitat of this gregarious animal, was possibly the primary factor in its demise, but rabbits, foxes and stock no doubt played their part." (4:90)

Protective measures already taken: "Bernier and Dorre Islands are Class A reserves for the protection of fauna. It is fully protected by law in Western Australia." (5)

Measures proposed: "... it would certainly be most desirable to remove the goats from Bernier Island as soon as possible to prevent further alteration to its natural environment but this alone will not be enough; we must also prevent man-caused fires and rigorously protect the islands against the thoughtless liberation of further alien species. In these ways alone can we hope to ensure that Bernier and Dorre will retain their faunas - faunas which make them biologically unique and a living and irreplaceable part of the "old" Australia." (4:90)

Number in captivity:

Breeding potential in captivity: "The species probably could be established in captivity with the precautions of supplying protection from dogs and artificial warmth for the initial acclimatisation. Being timid creatures they are easily frightened and damage themselves on the netting fences." (4:62)

- References:
1. Harper, 1945
 2. Tate, 1948
 3. Troughton, 1962
 4. Ride & Tyndale-Biscoe, 1962
 5. J. H. Calaby, in litt. 30/1/63

BRUSH-TAILED ROCK-WALLABY

Petrogale penicillata penicillata (Griffith, Smith & Pidgeon, 1827)

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "Small wallaby with dull grey-brown head and body, belly pale grey, face dark grey-brown with light cheek stripe, tail bushy and of uniform diameter to tip, rufous at base, black distally, distinguished from P. xanthopus by unbanded tail; head and body 720mm.; tail 560mm." (2:100)

Present distribution: "The range of the nominate race is greatly reduced but it still occurs in scattered colonies from eastern Victoria to southern Queensland." (6) In New South Wales it still persists near Armidale and in the Blue Mountains. (2:101)

Former distribution: "Former wide distribution in the eastern part of the State [of New South Wales] on both sides of the Great Dividing Range from Queensland to Victoria, and extending as far west as Deniliquin (35°32'S., 144°58'E.) in the south and Coombe (32°48'S., 145°27'E.) in the centre." (2:100-101)

Status: An assessment of the status of the species and subspecies of Petrogale must await a taxonomic revision of the genus, which is being undertaken by Dr. W.D.L. Ride. (6)

Estimated numbers: "At least some hundreds in the areas I studied." (6)

Breeding rate in wild: "The litter size is usually one." (4:88)

Reasons for decline: Troughton ascribes the decline of this species to "the ravages of fox and gun" (3:178); Harper also quotes various authors to the effect that "despite protective laws, shooters, foxes and hounds leave little chance of survival." (1:104) However, it is doubtful if these were the main causes of decline; destruction or alteration of the habitat was probably the principal reason. (6)

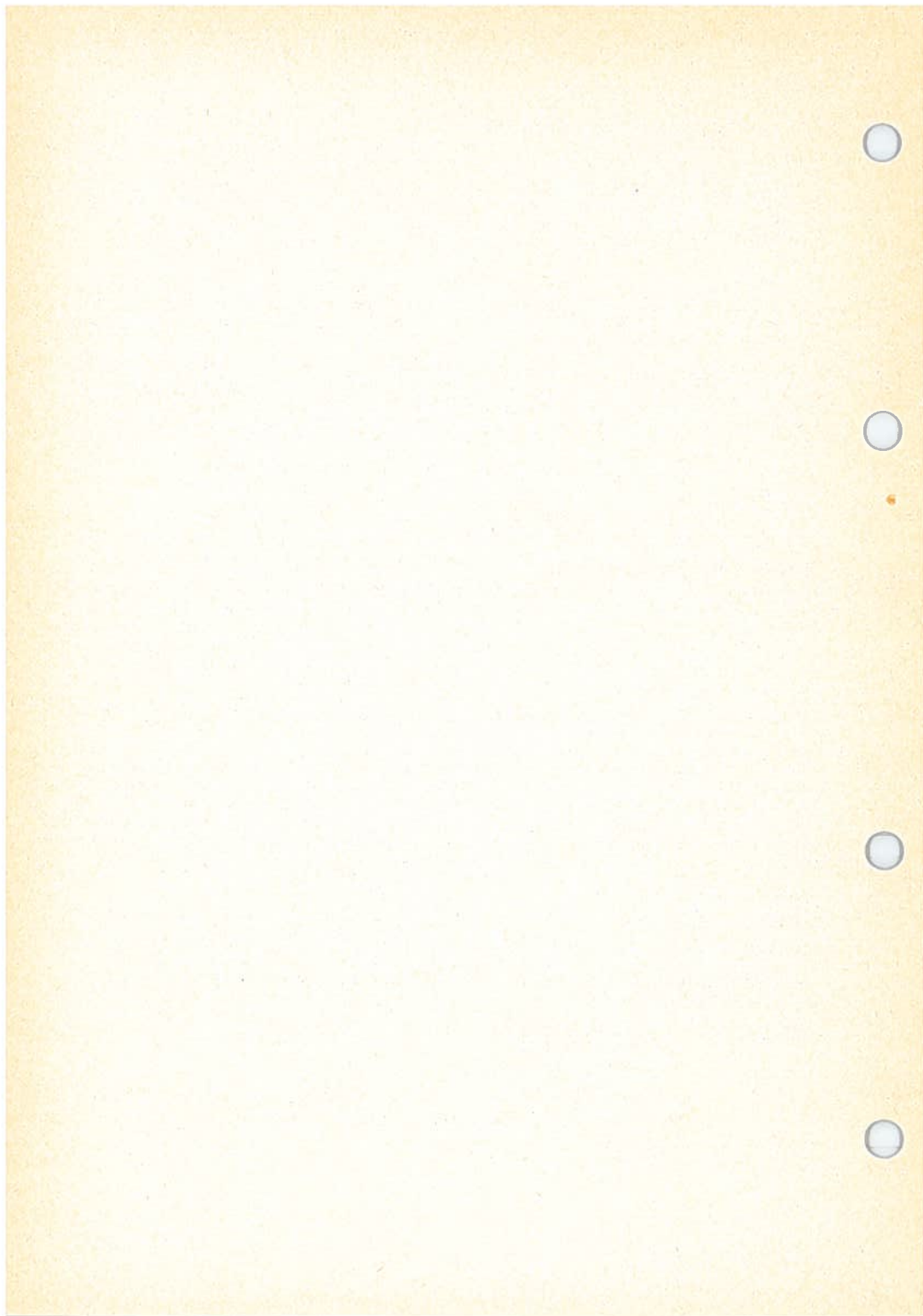
Protective measures already taken: "The species has been acclimatized on Kawan Island, New Zealand, where it was introduced about 1870 and now exhibits some alteration of coloration (Le Souef, 1930, p. 111)." (1:104) "This form has also become established in the wild on one of the Hawaiian islands." (6) "The Victorian Government has established a reserve to assist the survival of this form in that State. It occurs in some reserves in New South Wales. This species is gazetted 'Rare Fauna' in New South Wales, which means that the penalty for killing or interfering with it is much more severe than it is with other protected species not so gazetted." (6)

Measures proposed:

Number in captivity: Adelaide, 1 ♂ and 3 ♀; Auckland, 3 ♂♂ and 3 ♀♀. (5:372)

Breeding potential in captivity: "In general the kangaroo family are easy to keep in captivity and breed readily; in fact there are no exceptions to this rule among those species of macropodids which have been regularly kept in captivity." (6)

- References:
1. Harper, 1945
 2. Marlow, 1958
 3. Troughton, 1962
 4. Walker, 1964
 5. Jarvis, 1965
 6. J.H. Calaby in litt. 30/1/63 to 21/6/65



RING-TAILED ROCK-WALLABY

Petrogale xanthopus xanthopus Gray, 1855

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "Small wallaby with grey head and body, white belly, prominent white cheek stripe and white hip stripe, limbs rich yellow, tail with alternating bands of brown and yellow which distinguish it from P. penicillata. Head and body 680-800 mm.; tail 600 mm." (2:101) "The brownish yellow feet, the barred base of the tail, and strong shoulder marks are highly distinctive." (1:275)

Present distribution: "Still occurs in reasonable numbers in the Flinders Range of South Australia, and probably also in the extreme west of New South Wales and south-western Queensland." (6)

Former distribution: "The rocky country from the Gawler to the Flinders Range in South Australia, extending to the eastern boundary of the State at Bimbowrie and Cookburn." (3:185) In New South Wales it "has been recorded only from Cookburn (32°5'S., 141°0'E.) on the South Australian border ... the most recent record is 1924." (2:101)

Status: "It was stated to be fairly abundant in certain parts in 1924, but had already completely disappeared from many of its old haunts." (3:185) Still reasonably secure in the Flinders Range. (6)

Estimated numbers:

Breeding rate in wild: "The litter size is usually one." (4:88)

Reasons for decline: "According to Wood Jones in 1924, the species would almost certainly disappear from the eastern part of the State in a few years, since the soft-furred and brilliantly coloured pelt is far too attractive to permit survival near man, so long as the fur trade exists. Although it is a totally protected animal in South Australia, such protection is not extended by all bordering States and it is therefore not surprising to find that pelts are being disposed of in markets of other States, though illegally taken within the boundaries of South Australia." (3:185)

Protective measures already taken: "It has been fully protected over its entire range for many years." (6)

Measures proposed:

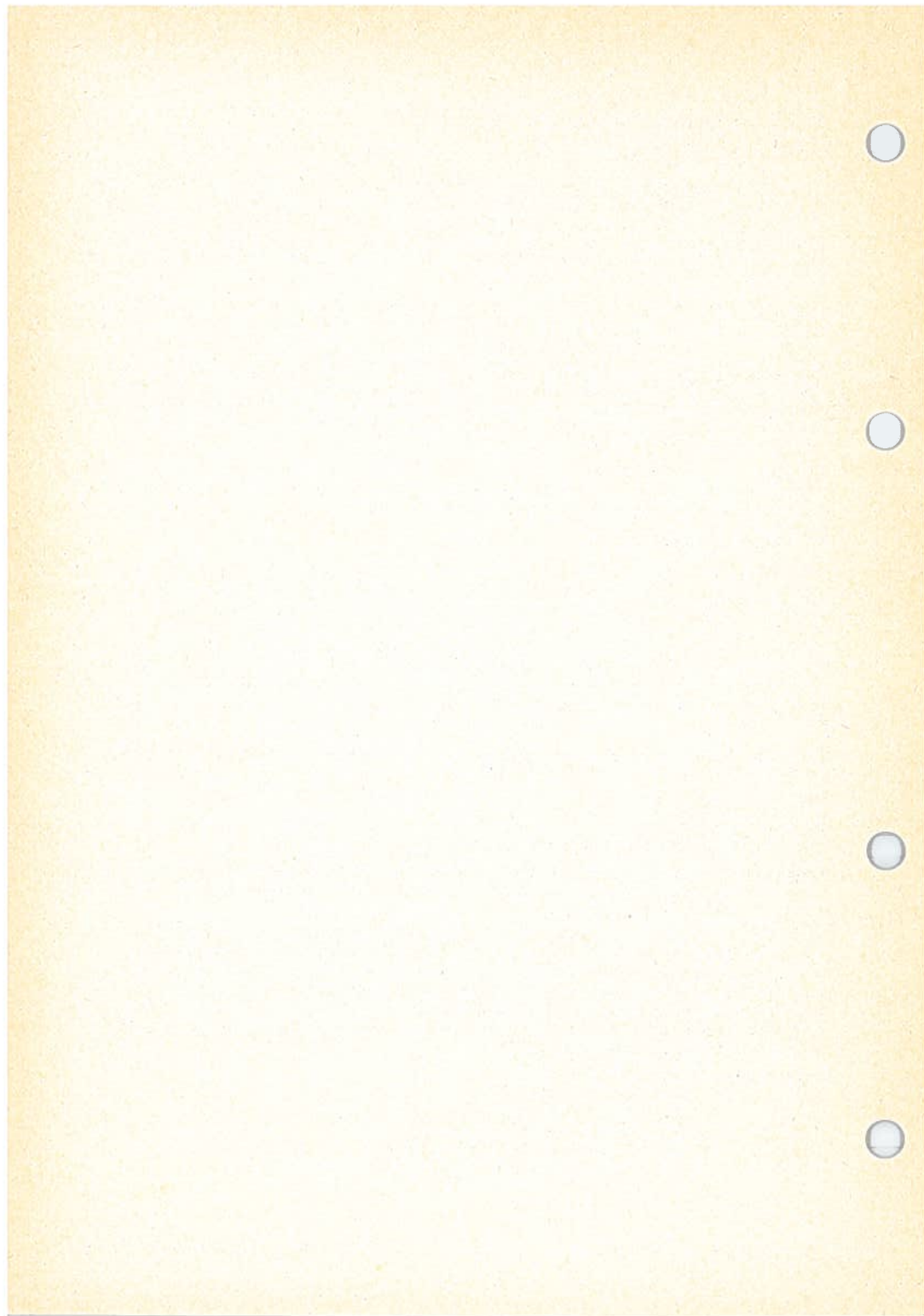
Number in captivity: 16 ♂♂ and 32 ♀♀ + 4, of which the majority are at the Adelaide Zoo and the remainder at the Perth Zoo. (5)

Breeding potential in captivity: All the 48 specimens at the Adelaide Zoo were born in captivity. The last two wild caught specimens were obtained in 1937 and 1940 respectively. (5)

Remarks: "A smaller geographical race (P. xanthopus celeris Le Souef) is based on specimens from Terachy Station, near Adavale, south-western Queensland, where it inhabits ranges in the vicinity of the Bulloo River. The animal is of a generally browner, less contrasted coloration: the white markings are washed with buff, the colour of the ears and feet is darker, and the tail shows only faint traces of the rings characteristic of the typical South Australian race." (3:186)

References:

1. Tate, 1948
2. Marlow, 1958
3. Troughton, 1962
4. Walker, 1964
5. C. Jarvis in litt. 5/6/63
6. J.H. Calaby in litt. 30/1/63 to 21/6/65



BRIDLED NAIL-TAIL WALLABY

Onychogalea fraenata (Gould, 1841)

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "Medium-sized wallaby; clear grey head and body, pale grey belly, tail grey with black tip and terminated by small horny spur; broad white stripe edged with black extends from axilla along side of neck to base of ear; black stripe through eye, faint white hip stripe; rhinarium hairy; head and body 460 - 650 mm., tail 380 - 450 mm." (3:99)

Present distribution: "I do not know of any existing colonies, but there may well be a remnant left." (5)

Former distribution: "It formerly occurred from central Queensland through inland New South Wales and perhaps into adjacent areas of South Australia." (5)

Status: "Either rare or absent over the entire range." (4:188) "Rare in New South Wales; the most recent record is 1924 at Manilla (30°45'S., 150°34'E.)." (3:100)

Estimated numbers: Unknown.

Breeding rate in wild: "Of this species Krefft writes (1865, p. 19), ... 'female producing one young at a time, generally in the beginning of May; pouch containing four teats.'" (2:278)

Reasons for decline: "Habitat alteration by European man and his domestic animals, and long-term environmental changes." (5)

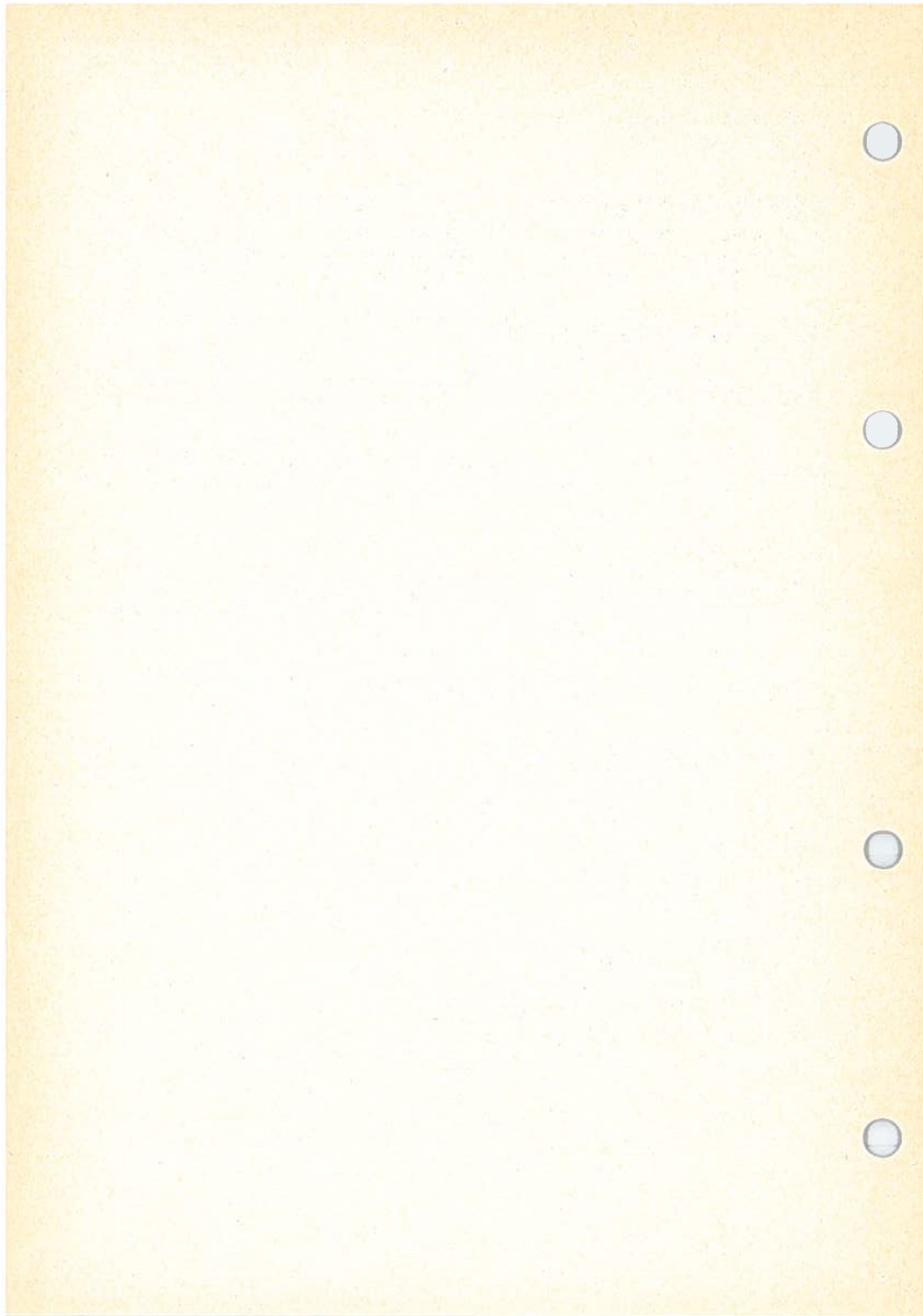
Protective measures already taken: Troughton states that a colony has been established on Bulba Island, near Newcastle (4:189), and such sanctuaries "probably represent the only means of preventing extermination." (1:100) The species is gazetted 'Rare Fauna' in New South Wales. (5)

Measures proposed: None.

Number in captivity:

Breeding potential in captivity:

- References:
1. Harper, 1945
 2. Tate, 1948
 3. Marlow, 1958
 4. Troughton, 1962
 5. J.H. Galaby in litt. 30/1/63 to 21/6/65



CRESCENT NAIL-TAIL WALLABY

Onychogalea lunata (Gould, 1841)

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "In general appearance it is very similar to the Bridled Nail-tailed Wallaby but is slightly smaller; general color dark gray; face gray, a mark over eye and cheek stripe slightly paler; a prominent white crescent-shaped shoulder stripe, not encroaching on the neck; back and sides of neck rich rufous; a whitish hip stripe and another stripe just above it; under parts whitish; tail uniform gray, its terminal nail as in O. fraenata. Male: head and body, 500 mm.; tail, 332 mm. (Thomas, 1888, pp. 77-78)." (1:100)

Present distribution: May still be found on the Nullarbor Plain. May also still exist "in the more desert-like conditions between the Great Victoria Desert and Trans-Railway, to the eastward." (1:102)

Former distribution: Southern parts of Western Australia and eastern and central South Australia. (3:189)

Status: "At the present time this is one of the rarest of Central Australian macropods ... one was killed between the Tarlton and Jervois Range as late as 1956. In 1932-35 it was still being reported and occasionally obtained by natives in the south-west sector, but I have personal knowledge of only two specimens taken in that period." (2:166) "It has disappeared from the settled parts of Australia. I know of no recent records of the living animal." (4)

Estimated numbers: Unknown.

Breeding rate in wild:

Reasons for decline: "Doubtless settlement and the concomitant imported pests have accounted for the decline of this lovely wallaby." (1:102)

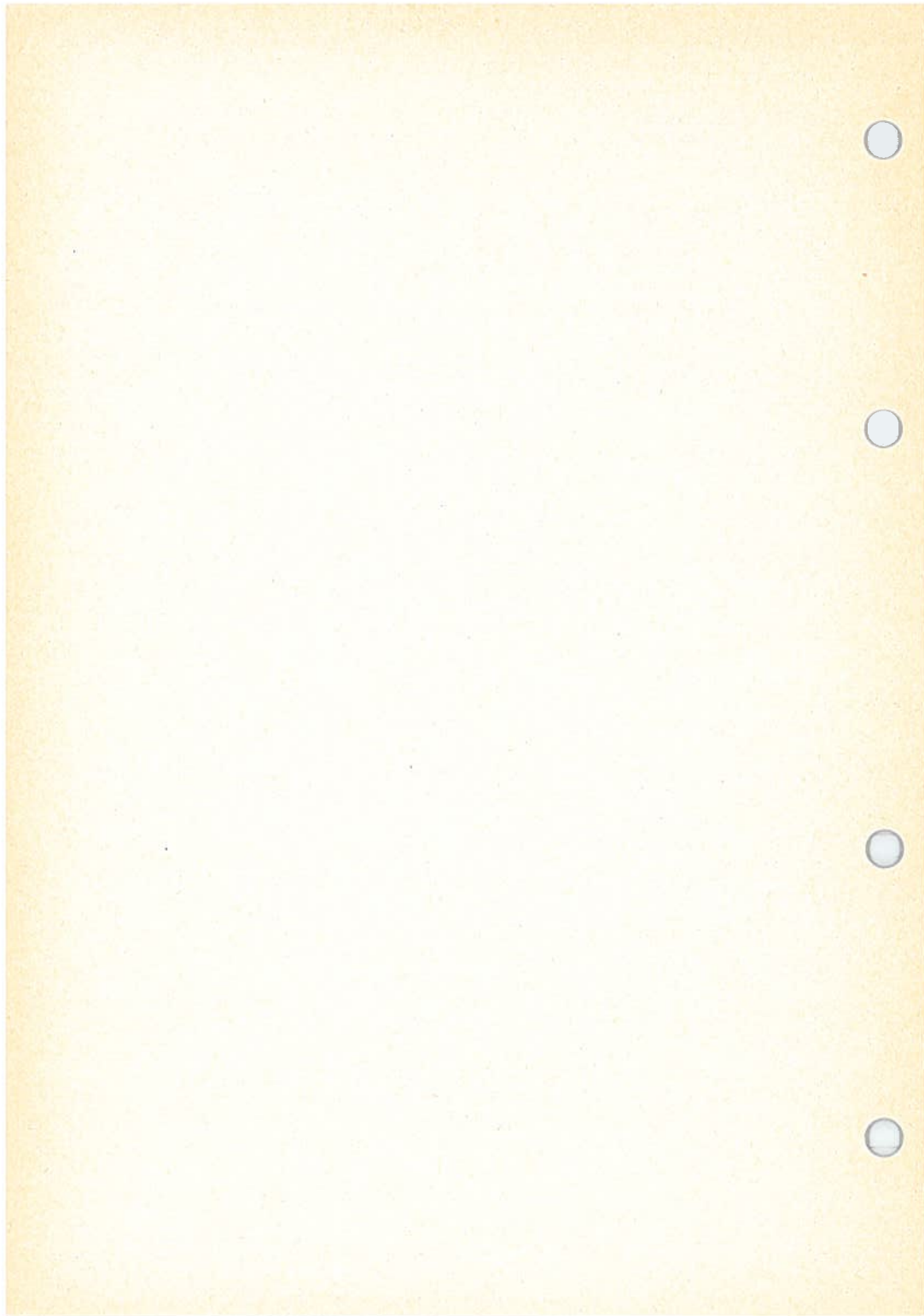
Protective measures already taken: None.

Measures proposed: Troughton recommended the establishment of a suitable island sanctuary, as was done for the eastern species, but this proposal does not appear to have been adopted. (3:190)

Number in captivity: None.

Breeding potential in captivity: Unknown. Probably good.

References: 1. Harper, 1945
 2. Finlayson, 1961
 3. Troughton, 1962
 4. J. H. Calaby, in litt. 30/1/63



WHITE-THROATED WALLABY

Protemnodon parma (Waterhouse, 1846)

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "Smallest species of Protemnodon with rufous-brown head and body, belly pale grey or white. Distinct dark dorsal stripe present; similar to P. dorsalis but distinguished by lack of white hip stripe, and smaller size; head and body 590-640 mm., tail 410 mm." (3:101)

Present distribution: It conceivably still occurs in the Dorriggo area, New South Wales. (4)

Former distribution: "It was known to occur in two discrete areas of New South Wales - the Illawarra District extending southwards to Nowra and Sassafras, and the Dorriggo area of northeastern New South Wales. These localities are roughly 300 miles apart. It was never collected in the intervening country." (4)

Status: "Rare and possibly extinct ... P. parma seems always to have been rare." (2:344) "Unknown. No specimens have been taken in the southern locality during the present century and it is presumed to be extinct there. Two specimens were taken in the Dorriggo area in 1932. These were not reported in the literature until 1948 (Tate). No one has looked for it since then." (4)

Estimated numbers: Unknown. "About sixteen specimens of this rare wallaby are known to have been collected although some of these are apparently not now in existence." (4)

Breeding rate in wild:

Reasons for decline: "The Illawarra was an extensive rain forest area and this has been virtually destroyed and cleared for agricultural purposes. The destruction of the rain forest probably accounts for the disappearance of the wallaby in the Illawarra area." (4)

Protective measures already taken: Gazetted 'Rare Fauna' in New South Wales. (4)

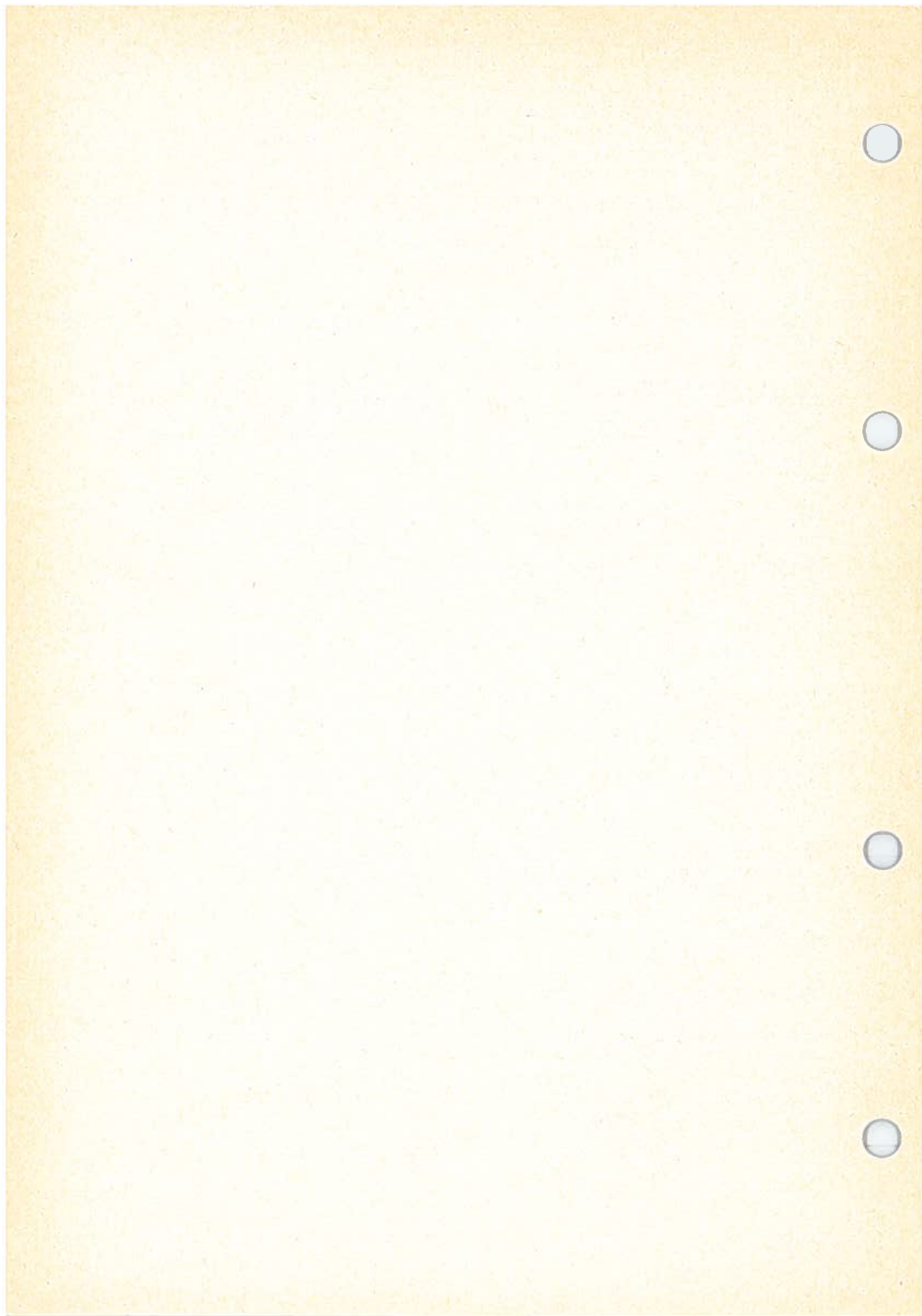
Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: It would probably breed as readily in captivity as other members of this family. (4)

References:

1. Tate, 1948
2. Ride, 1957
3. Marlow, 1958
4. J. H. Calaby, in litt. 30/1/'63 to 21/6/'65



BRUSH-TAILED RAT-KANGAROO

Bettongia penicillata penicillata Gray, 1837

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "The general color is ashy brown, penciled with white and brownish black; cheeks and throat faintly tinged with yellowish; under parts dirty white; hands and feet pale brown; tail brown above, pale brown below, the apical third with a black dorsal crest. Head and body, 343 mm.; tail, 285 mm. (Waterhouse, 1846, vol. 1, p. 213)." (1:82)

Present distribution: "A remnant colony which probably exists on Cape York Peninsula, Queensland is probably of the subspecies B.p. penicillata." (4)

Former distribution: "This subspecies formerly occurred from Cape York Peninsula to Victoria." (4)

Status: "The status of the species is even more insecure than that of B. lesueuri. Probably 9/10ths of its former range is now empty of it and it survives only in three widely separated localities of North Queensland, the Western Centre, and the south-west of Western Australia. Its hold in the two former is slight and in the latter alone does there seem much hope of perpetuating it." (2:273)

Estimated numbers: Unknown.

Breeding rate in wild: "Data on reproduction in the field is scanty; a female in my collection taken in July at Augusta in the extreme south-west of Western Australia, had a large furred pouch young of head and body length 210 mm. D. L. Serventy (1953-55), records large pouch young at the end of March. These two records seem to indicate that the very rapid increase of its populations, which used to occur in Western Australia, were due to the species breeding several times in the year as Krefft (1862) suggested was the case with B. lesueuri. Krefft observed only single young in the pouch in New South Wales." (2:275)

Reasons for decline: Finlayson considers that "long term climatic changes involving increased aridity and adverse vegetative changes" were probably the principal causes of decline. Aboriginal hunting "may have hurried along the exterminating process... Some of the hunting methods of the blacks, especially the "fire-trap" technique, in which large areas of vegetation are burnt out, must have borne very hard on non-burrowing species, like Bettongia penicillata." (3:149-50)

Protective measures already taken: None.

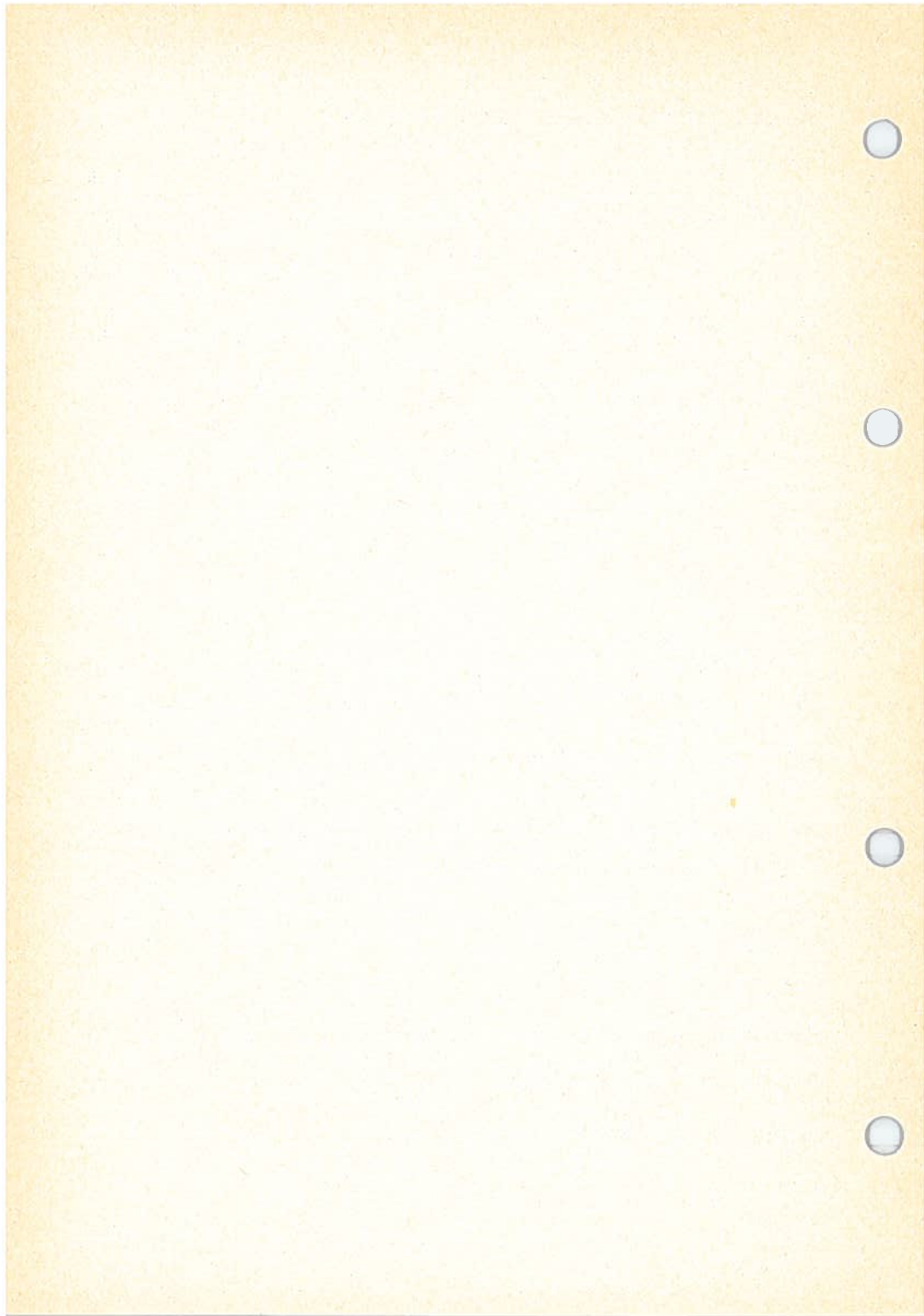
Measures proposed: None.

Breeding potential in captivity: Probably good.

References: 1. Harper, 1945
 2. Finlayson, 1958
 3. Finlayson, 1961
 4. J.H. Calaby in litt. 30/1/63

Status category: 4(b)

Code number: MA/10/BETTO/PEN/PEN



LESUEUR'S RAT KANGAROO

Bettongia lesueuri (Quoy and Gaimard, 1824)

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "Similar to B. penicillata and B. gaimardi but distinguished by absence of crest on tail; manus and pes white or pale brown, tail with white tip; head and body 457 mm., tail 290 mm." (1:97)
"... ears are short and the tail is nearly hairless - in captivity the tail becomes extremely fat. The claws of the forefeet are white and by this it can simply be told apart from Lagorchestes hirsutus which it resembles in colour." (5:67)

Present distribution: "Possibly remnant pockets remain in north-western and central Australia. It is still fairly common on Bernier and Dorre Islands." (6)

Former distribution: This rat kangaroo "had one of the most extensive continental ranges of any of the Australian marsupials, reaching from about 14° South lat. in the north-west down to the extremity of the south-east coast in lat. 37° 50' South, and from the west coast almost across to the eastern cordillera in New South Wales. The north-eastern sector embracing most of Queensland and part of New South Wales has yielded no published records of the species and thus forms an interesting hiatus in its distribution, but whether of fact or merely record, is somewhat doubtful. The range has frequently been given as Western and South Australia and this has misled many writers, even in recent years, to overlook its former presence in Victoria and New South Wales. That it occurred in the Murray districts of these States in 1863 was plainly attested by Krefft in Lydekker (1894) and more doubtfully, in northern New South Wales in 1865 by Macgillivray (in Iredale 1937). Tate (1948) has also published evidence of its occurrence in Victoria." (2:238)

Status: "... for various reasons, it now appears to be virtually extinct over most of its former range (see Finlayson, 1958). Certainly, no specimens from the mainland of Western Australia have been received by the Western Australian Museum since 1935 ... On Bernier and Dorre, however, it is relatively common, and being, by nature, wary and living in a fire resistant burrow it would seem to be secure unless rabbits, foxes, or cats were to become established on the islands ... In some parts of the islands Bettongia seemed to be extremely abundant." (5:64)

Estimated numbers: Unknown.

Breeding rate in wild: "One young is produced, and leaves the pouch in November after occupying it for nearly four months." (4:161) Ride and Tyndale-Biscoe record that in one year a "female had been breeding continuously and had produced three offspring. This suggests that Bettongia on Bernier and Dorre Islands has a high reproductive potential. ... [One] female had attained sexual maturity about 5 months after birth." (5:69)

Reasons for decline: Pastoral exploitation of the country was "no doubt a major cause of decline and perhaps the chief one. Although the total numbers of ungulate stock seem relatively small when compared with the area occupied, the constant movement to and from watering places causes a multiplication of a disturbing factor with which many native species, especially the surface nesting forms, cannot cope. It has constantly been observed on stocking virgin country, that many native species disappear long before any question arises of competition for food. In many cases no competition for food is involved at all ..." (3:150)

Protective measures already taken: Protected by law. (6) Bernier and Dorre Islands are a Class A Reserve of approximately 26,000 acres, established for the conservation of fauna, and vested in the Fauna Protection Advisory Committee of Western Australia. (5:3) "We owe to the energetic intervention of the late Professor Wood Jones the possibility of the survival of the species in the south. In 1920 he obtained living specimens from the Lake Phillipson area in the north-west division, and successfully maintained them as a breeding colony at the University of Adelaide for some years. Some of the progeny of this group were transferred in 1924 to the sanctuary of Flinders Chase at the western end of Kangaroo Island at the mouth of St. Vincent Gulf. The site is for the most part densely bushed and not very well suited to its habits, but recent reports from the Ranger indicate that it is still extant though its increase is slow." (2:260)

Measures proposed: "... it would certainly be most desirable to remove the goats from Bernier Island as soon as possible to prevent further alteration to its natural environment." (5:90)

Number in captivity:

Breeding potential in captivity: Breeds freely in captivity. (4:161)

Remarks: "Two races have been separated from the original insular form; B. lesueuri grayi Gould 1840 based on the Swan River in Western Australia and B. lesueuri harveyi Waterhouse 1842 from Eyre Peninsula, South Australia. In addition, the insular form B. lesueuri lesueuri Quoy and Gaimard 1824, has now been accorded a representation on the adjoining mainland by Glauret (1950). While these names have been widely used, the morphological basis on which they have rested is of the flimsiest, and as Harper (1945) has pointed out, the lines of demarcation or intergradation between the forms are quite unknown." (2:238-239)

References:

1. Marlow, 1958
2. Finlayson, 1958
3. Finlayson, 1961
4. Troughton, 1962
5. Ride & Tyndale-Biscoe, 1962
6. J.H. Calaby in litt. 30/1/63

TASMANIAN RAT-KANGAROO

Bettongia cuniculus (Ogilby, 1838)

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "The Bettong resembles a small wallaby but is the largest of the Rat Kangaroos. It can be distinguished from the wallabies by the slight lateral compression of the tail. The face is shorter than in the Potoroo. The colour is variable, ranging from a sandy colour to dark brown, but always with a light coloured undersurface. There is usually a white tip to the tail ... The hind foot is longer than the head. The hair is thick and coarse with black hairs at the end of the snout." (1:26)

Present distribution: "Restricted to Tasmania, where it favours the grassy plains and stony ridges on the outskirts of forests." (2:161) "Localities in which this species has been captured recently are West Tamar, Taranna, Epping Forest, South Arm, Broadmarsh, New Norfolk, Ouse and Risdon." (1:26)

Former distribution: "According to Gould's excellent account, it was more evenly dispersed and better known in the old Van Diemen's Land days ..." (2:161)

Status: "It is apparent that the species is widespread in suitable country." (1:26)

Estimated numbers: Unknown.

Breeding rate in wild: According to Guiler "the breeding season is extended, being from at least March to December. Usually only one young is found in the pouch, though some captive specimens had twins. The gestation period is about six weeks. The young probably spend about four months in the pouch." (1:26)

Reasons for decline: Guiler states that it was "very common in Colonial days ... However, the species has probably suffered considerably from farming operations and will continue to do so." (1:26)

Protective measures already taken: "It is fully protected by law." (3)

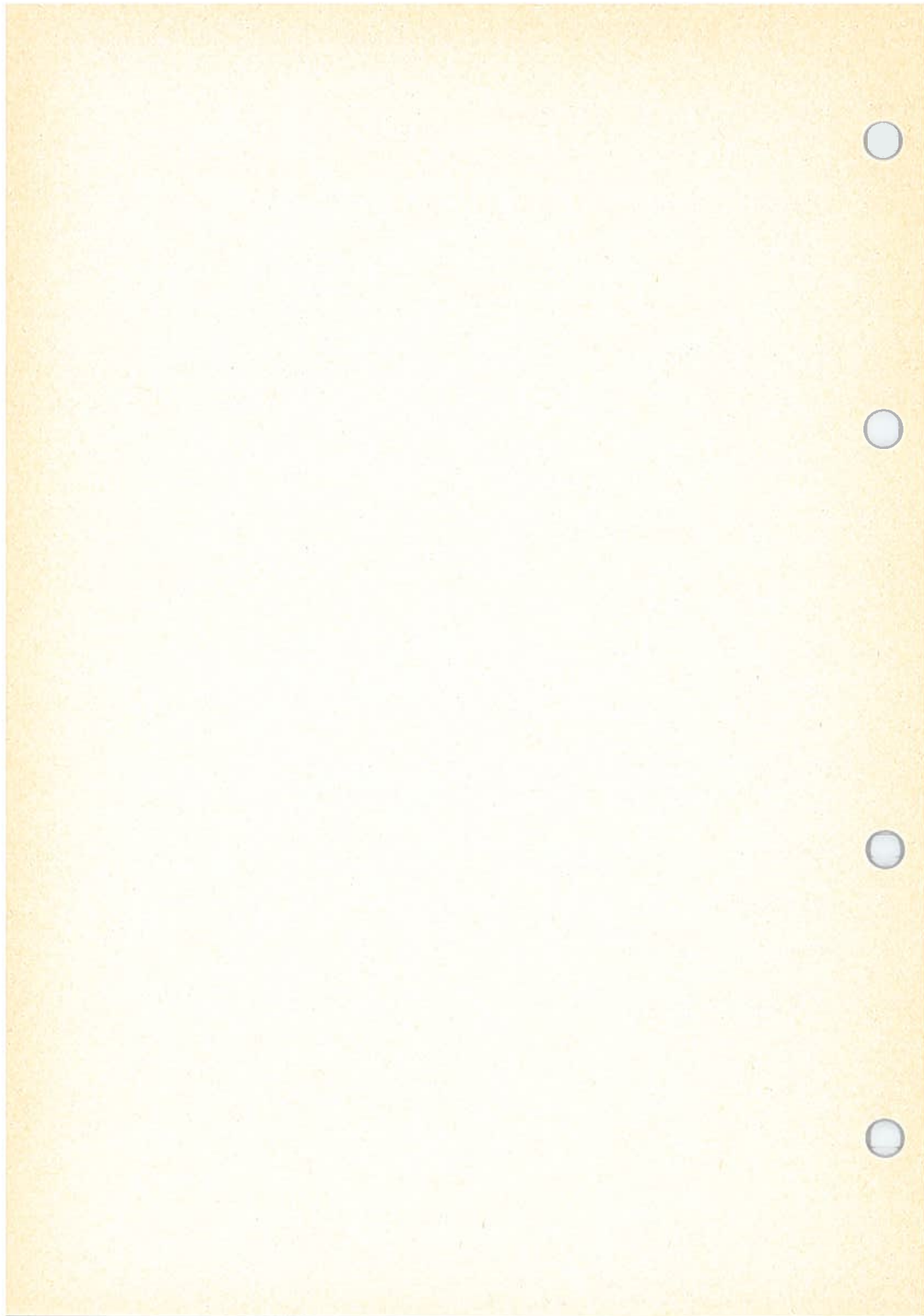
Measures proposed: None.

Number in captivity:

Breeding potential in captivity: "All members of this family breed readily in captivity." (3)

References:

1. Guiler, 1960
2. Troughton, 1962
3. J. H. Calaby in litt. 30/1/63 to 21/6/65



DESERT RAT-KANGAROO

Caloprymnus campestris (Gould, 1843)

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "Under fur dense and soft, very pale yellowish brown, the hairs tipped with sooty brown; interspersed with the under fur (especially on the back) are many long brownish white hairs, tipped with blackish; sides dirty yellowish; under parts dirty white; feet and tail very pale yellowish brown. Head and body, 400 mm.; tail, 355 mm. (Gould, 1843, p. 81)." (3:91)

Present distribution: "The known distribution of this animal as a recent species is in a portion of the eastern part of the Lake Eyre Basin ... between Coorabulka in Queensland and Mulka in South Australia and east to Innamincka." (4:170)

Former distribution: "Its proved distribution may be extended over a large area of the eastern portion of the Lake Eyre Basin, specimens and reliable records from observers personally known to the author having been obtained from as far south as Lake Harry and as far north as Coorabulka in South-West Queensland. The north and south limits of its range, as at present ascertained, are, therefore, approximately, lats. 23°40' and 29°21' south. No records have so far been obtained west of Lake Eyre and the Kallapoopah, and the furthest easterly occurrence is at Innamincka, on the Barcoo, in long. 140°49' east." (1:148)

Status: "In normal times the animals are very scarce and, being also remarkably solitary in habit, and very seldom seen by the whites." (5:167) A specimen received by Finlayson in September 1931 was "the first to be taken since the three original specimens on which Gould founded his description of the species in 1843." (1:148) "... it occurs in very small numbers but is subject to occasional increase as in 1931. I know of no reliable records since 1935." (4:170)

Estimated numbers: Unknown.

Breeding rate in wild: Finlayson states that the breeding season is irregular. "In no case was more than one embryo present in the pouch, but in one female, two of the total four mammae were functioning." (1:154)

Reasons for decline: "In ordinary years the Lake Eyre Basin is a most unattractive area from the point of view of the mammal collector, and the disappearance of Caloprymnus from scientific ken must be attributed rather to lack of systematic collecting than to any sudden change in the status of the animal in the fauna, following Grey's discovery. All the evidence obtained by questioning blacks goes to show that in all probability it has

had an uninterrupted tenure of the country, but it is equally certain that in normal times its numbers are small, since men like Mr. Reese, whose opportunities for observation are practically continuous throughout the year, affirm that in thirty-five years they have seen no more than twenty specimens." (1:150-151) "Where Diprotodon failed [to survive], Caloprymnus may yet succeed, but all the evidence of its physical structure is not more eloquent of changed conditions [from relatively humid to an arid climate] than its pathetic clinging to its flimsy grass nest, in a fiery land where a fossorial habit has become the main factor in survival." (1:165)

Protective measures already taken: None.

Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity:

References: 1. Finlayson, 1932
 2. Tate, 1948
 3. Harper, 1945
 4. Finlayson, 1961
 5. Troughton, 1962

LONG-NOSED RAT-KANGAROO

Potorous tridactylus tridactylus (Kerr, 1792)

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "Slightly larger than B. penicillata with grizzled grey-brown head and body, grey-white belly, tail uncrested, naked rhinarium with a backward extension onto the dorsal surface of the muzzle - this distinguishes it from Bettongia spp.; head and body 410 mm.; tail 230 mm." (3:98)

Present distribution: Survives in some places in the northeastern districts of Victoria, in the Grampians and probably in the Otway ranges. In the western part of the state it is found in the Portland area. "There are also two remnant colonies known in New South Wales and others in southern Queensland." (5) In New South Wales it occurs in the "coastal region and eastern slopes of the Great Dividing Range from the Richmond River south to the Shoalhaven River, and west as far as Armidale (30°31'S., 151°39'E.)." One recorded in 1913 from Barrington (31°58'S., 151°55'E.) and another from Gosford (33°25'S., 151°20'E.) in 1958. (3:98)

Former distribution: "Formerly ranging from South Australia through Victoria and New South Wales to south Queensland ..." (2:89)

Status: Extinct in South Australia and rare in the remainder of its range. (5)

Estimated numbers:

Breeding rate in wild: "Observations on both captive and wild populations suggested the existence of two breeding seasons, one in late winter and early spring, the other in summer. However, the evidence on which these breeding seasons are based is extremely limited." (4:193-194) "... this picture is complicated by the phenomenon of delayed pregnancy by which the normal gestation period of about 38 days may be prolonged for periods up to 4½ months. ... In macropod species including Potorous it is exceptional for pregnant females to carry more than a single embryo or for more than one pouch young of the same age to be suckled at one time." (4:215) "Permanent attachment of the offspring to a teat occupied 64 days in one instance." (4:193)

Reasons for decline: "Habitat alteration caused by clearing for agriculture and pastoral pursuits, and exploitation of forests for timber was possibly the major cause." (5)

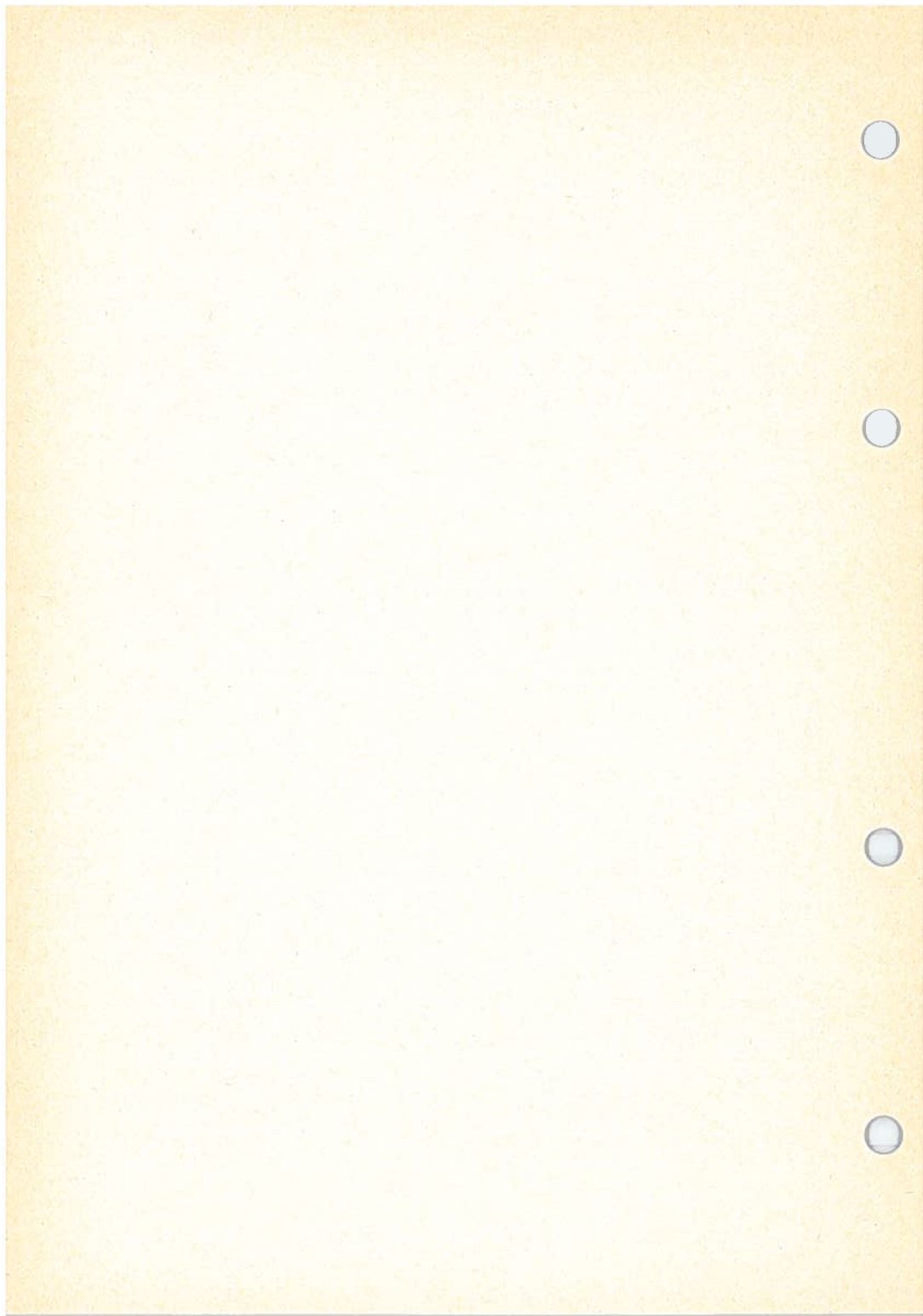
Protective measures already taken: "It is protected by law in Victoria and is gazetted 'Rare Fauna' in New South Wales." (5)

Measures proposed: "The remaining Potoroos should be carefully protected in those places where they still survive, and efforts should be made for turning them down in properly safeguarded sanctuaries. If this is not done there seems to be no doubt that the remnant of the stock will share the fate of the South Australian form and rapidly become extinct." (1:218)

Number in captivity: Adelaide Zoo has 2 ♂♂ and 4 ♀♀. (5)

Breeding potential in captivity: "Like other members of this family it is believed to breed readily in captivity." (5)

- References:
- | | |
|------------------------|-------------------------------------|
| 1. Wood Jones, 1923-25 | 4. Hughes, 1962 |
| 2. Harper, 1945 | 5. J.H. Calaby <u>in litt.</u> |
| 3. Marlow, 1958 | 30/1/63 to 21/6/65 |
| | 6. C. Jarvis <u>in litt.</u> 5/6/65 |



MUSKY RAT-KANGAROO

Hypsiprymnodon moschatus Ramsay, 1876

Order MARSUPIALIA

Family MACROPODIDAE

Distinguishing characteristics: "This is the smallest of the "rat"-kangaroos: the length of the head and body is 235 to 335 mm., and the length of the tail is 130 to 170 mm. An adult male (head and body, 325 mm.) weighed approximately 500 grams. The pelage is close, crisp, and velvety, and consists mainly of underfur. The general coloration is rich brown or rusty gray, brightest on the back and palest on the under parts. Some individuals have a white area on the throat that extends as a narrow line to the chest." (3:102)

Present distribution: This rainforest species occurs in suitable habitat along the coast of northeastern Queensland and the Atherton Tableland inland from Mossman, Cairns, Innisfail and Townsville, an area extending about 200 miles along the coast and up to 40 miles inland. Not all of this area was originally rainforest and much of it has been cleared for sugar growing and other purposes. (4) "Our record from The Tableland near Helenvale is apparently the extreme recorded limit to the north. The range seems to include the forests on the east side of the Atherton Tableland generally." (1:592)

Former distribution: "The dense damp brushes and scrubs fringing the rivers of the Rockingham Bay district; around Cardwell; and about the lakes and streams of the Atherton Tableland, north-eastern Queensland." (2:154)

Status: "Except where its habitat has been cleared it appears to have maintained its original numbers ... Its status is difficult to ascertain owing to the dense nature of the habitat, but apparently it is persisting well." (4)

Estimated numbers: Unknown.

Breeding rate in wild: "It evidently breeds during the rainy season from about February to May. In March 1874 Ramsay records having obtained one with two very small young in the pouch. More than two are seldom found together unless accompanied by their young." (2:155)

Reasons for decline: Reduction of its habitat. (4)

Protective measures already taken: Fully protected by law. (4)

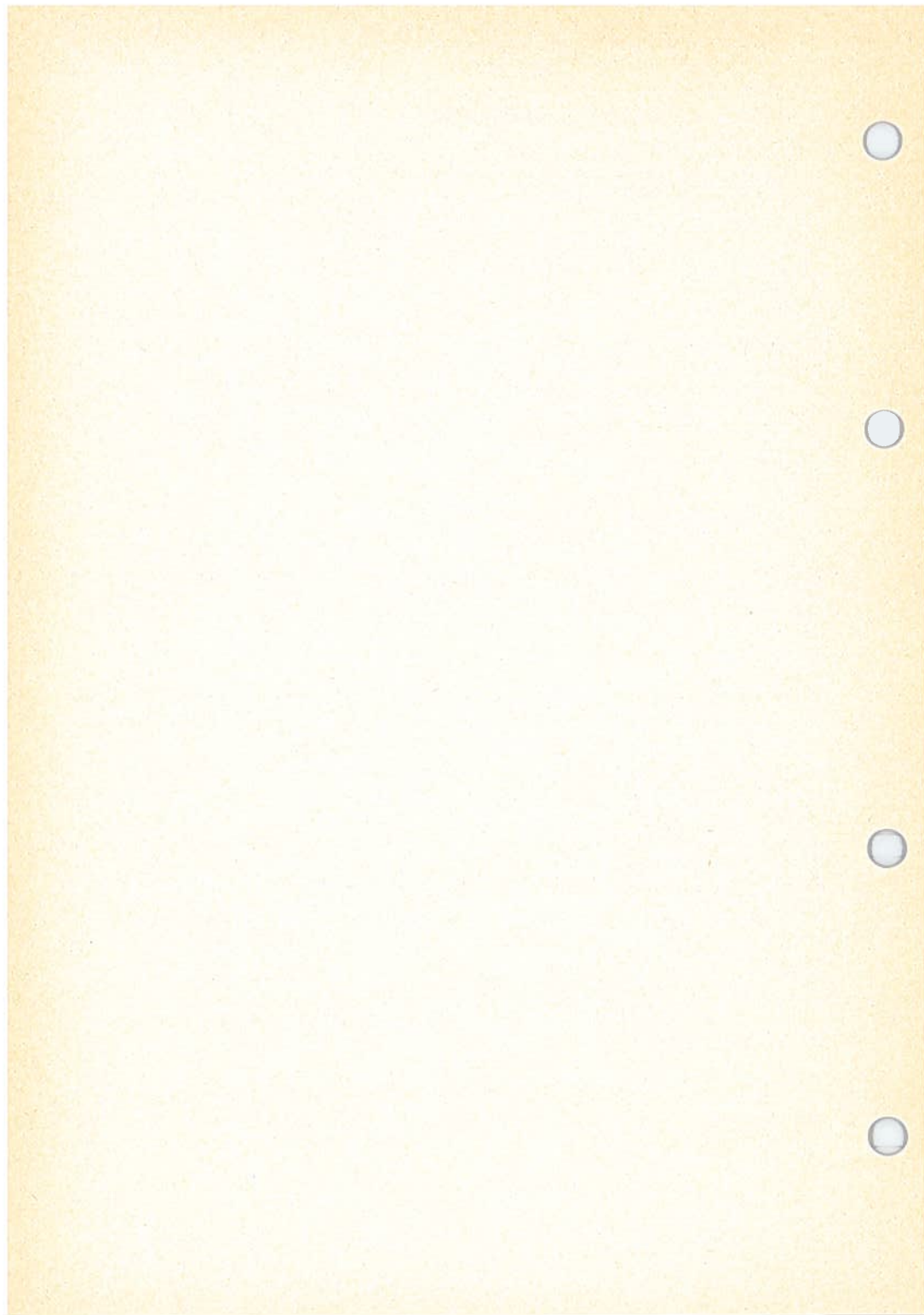
Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: "In general the kangaroo family are easy to keep in captivity and they breed readily: in fact there are no exceptions to this rule among those species of macropodids which have been regularly kept in captivity." (4)

References:

1. Tate, 1952
2. Troughton, 1962
3. Walker, 1964
4. J. H. Calaby, in litt. 30/1/'63 to 21/6/'65



CUBAN SOLENODON

Atopogale cubana (Peters, 1861)

Order INSECTIVORA

Family SOLENODONTIDAE

Distinguishing characteristics: "Pelage longer and finer than in Solenodon; claws more delicate but considerably longer than toes ..." (5:22) Barbour describes the nominate race as "brownish-yellow-headed ... with the long straggly cape of rather dirty ochraceous hair", whereas poeyanus "is a sharply marked black and white animal." (3:5)

Present distribution: All specimens taken since about 1890 "are black and white animals which came from the mountains of northeastern Cuba." (3:5) Still occurs in the mountains near Baracoa in the east of Oriente Province. (7)

Former distribution: Eastern, south-eastern and south-central Cuba. (5:22)

Status: The nominate race occupied the region about Bayamo, possibly in the lowlands ..." (3:5) "... Since no recent specimens have been found for many years, the yellow-headed subspecies may well be believed to be extinct." (3:4) The status of the surviving race, poeyanus, is "extremely difficult to determine. Occasional sightings are made when large trees are uprooted during the course of road construction." (6) "Our enquiries have indicated that very few specimens exist and the animal is in danger of extermination." (7)

Estimated numbers: Unknown.

Breeding rate in wild: 1 - 3 young at a birth. (5:21)

Reasons for decline: The introduction of the Burmese mongoose into Cuba is believed to account for the near-extirpation of the solenodon. (2:14) Barbour, writing of a captive specimen in Havana, states that poeyanus "is a good climber and likes to sleep high up in its cage, rather than in the small shelter which is provided for it. This is in sharp distinction to the Haitian specimens which we kept alive, and may indicate the possibility that the survival of S. poeyanus may be because it is by way of becoming a climber." (3:7) The solenodon is caught and consumed by the local people. (7)

Protective measures already taken: None.

Measures proposed: The Cuban Society for the Protection of Nature and the Conservation of Natural Resources has proposed that an extensive region of montane forest in the northeastern part of Oriente Province should be set aside for the protection of the solenodon and the ivory-billed woodpecker. (6)

Number in captivity: "The University of Santiago de Cuba is said to possess a living specimen." (7)

Breeding potential in captivity:

Remarks: "... they are in the New World the last living representatives of the group of insectivores with triangular instead of squarish molars, the Zalambodonta, found elsewhere at the present time only in Africa (the potomogale) and on the island of Madagascar (the Madagascar hedgehog and its relatives)." (2:14)

- References:
- | | |
|------------------|--|
| 1. Mohr, 1937 | 4. Hayman, 1956 |
| 2. Allen, 1942 | 5. Hall and Kelson, 1959 |
| 3. Barbour, 1944 | 6. A. Moreno <u>in litt.</u> 10/4/63 |
| | 7. Z. Vogel <u>in litt.</u> 3/2/65 & 10/1/66 |



HAITIAN SOLENODON

Solenodon paradoxus Brandt, 1833

Order INSECTIVORA

Family SOLENODONTIDAE

Distinguishing characteristics: "It is a stoutly built animal, with a total length of about 22 inches, of which the strong tapering tail constitutes about 10 inches. Males and females are alike in size and color, which varies from a mixed blackish and buff dorsally, with clearer yellowish sides, to a deep ferruginous tint, darkest and clearest on the lower throat. Characteristic is a small squarish spot of white in the middle of the nape. The tail is nearly naked and dusky in color except at the base, which is flesh-color. The feet and distal part of the limbs are nearly hairless and pale-tinted. The muzzle is provided with a long cartilaginous snout, supported at its base by a small round bone (the os proboscoidis). The feet are armed with strong, slightly curved claws for digging, five on each foot." (1:10)

Present distribution: "Still present in areas of stony forest in north-eastern Dominican Republic. ... According to Dr. Mohr, Herr Thumb found solenodons in dens among broken rock for the most part, or occasionally in hollow logs." (1:11)

Former distribution: "Known only from the island of Haiti." (3:21)

Status: "... this large insectivore was supposed to be nearly or quite extinct in its island habitat until 1907, when A. Hyatt Verrill found that it was still living in the interior of northeastern Hispaniola." No immediate danger of extinction, but clearing and cultivation of its limited range would have serious consequences. (1:10) "Still not uncommon." (5:43)

Estimated numbers: Unknown.

Breeding rate in wild: "The German collector Thumb found as many as eight solenodons in a single burrow [which] may be accounted for as the two parents with their young of two successive litters. Three of the families dug out by Thumb consisted of the adult pair and their single young." (1:12)

Reasons for decline: "If predators had been native to the islands, solenodons might have become extinct long ago, for they are slow moving and poorly adapted to avoiding enemies or to defending themselves. They are decreasing in numbers because of a low reproductive rate and by predation by introduced dogs, cats, and mongooses." (2:105)

Protective measures already taken: None.

Measures proposed: None.

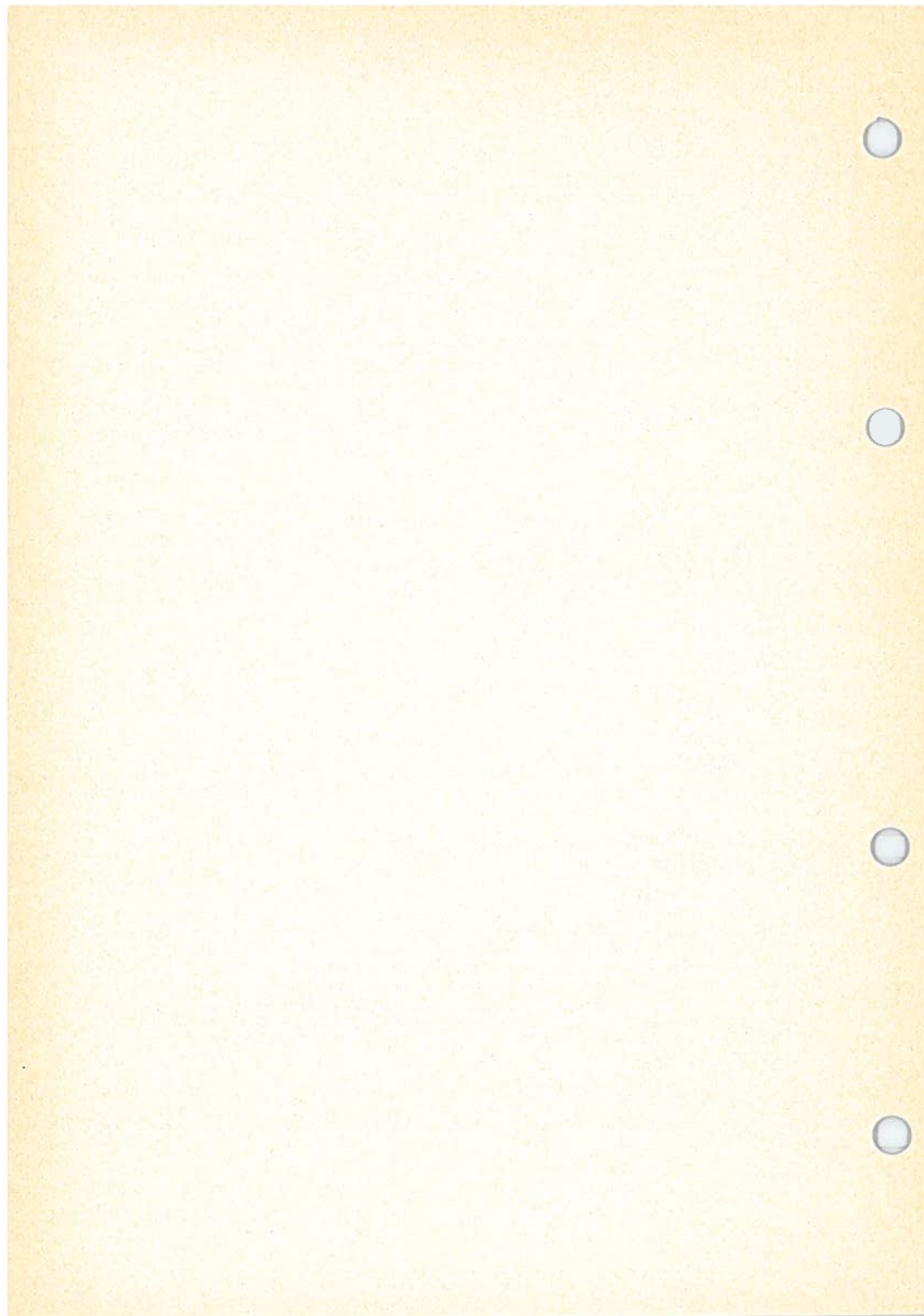
Number in captivity: "Following its rediscovery by Verrill in 1907, five living animals were sent to the zoological gardens at Washington and New York from the Dominican Republic, and others including four living adults were received by the Museum of Comparative Zoology at Cambridge." In 1935/36 a German collector shipped about 20 to the Hamburg Zoological Gardens. (1:11) "The New York Zoological Park recently was the recipient of a male and two female Hispaniolan Solenodon, captured on the island last year by medical researchers from Johns Hopkins University in Baltimore, and from the University of Maryland. I believe others were also captured, but have no data at the moment." (6)

Breeding potential in captivity: "In captivity it was ascertained that the female may have one to three, usually two, young at a birth and may bring forth twice in a single year, though showing no particular breeding season." (1:12)

- References:
- | | |
|------------------------|---|
| 1. Allen, 1942 | 4. Mohr, 1937 |
| 2. Walker, 1964 | 5. Hayman, 1956 |
| 3. Hall & Kelson, 1959 | 6. Marvin L. Jones <u>in litt.</u> 7/7/65 |

Status category: 2(a)

Code number: MA/11/SOLEN/PAR



MINDANAO GYMNURE

Podogymnura truei Mearns, 1905

Order INSECTIVORA

Family ERINACEIDAE

Distinguishing characteristics: Head and body approximately 130-150 mm.; tail about 40-70 mm. "The pelage is long, soft, and full. The color of the upper parts is gray mixed with reddish-brown hairs, and the under parts are hoary, slightly mixed with brown hairs. The moderately-haired tail is buffy to purplish flesh color." (3:128)

Present distribution: "... known only from Mindanao in the Philippine Islands. It has been collected on Mount Apo at elevations of 1,700 to 2,100 meters on the east slope of Mount McKinley, from 1,800 to 2,300 meters, and on Mount Katanglad at an elevation of 1,600 meters." (3:128)

Former distribution:

Status: "... it can be stated safely that (excluding rats) virtually any form of wildlife surviving today in the Philippines is threatened ..." (2:VI-6)

Estimated numbers: Unknown.

Breeding rate in wild: Nothing appears to have been recorded about breeding habits.

Reasons for decline: "During the past two decades the Philippine Islands have been a uniquely unfavorable habitat for the survival of virtually any wildlife at all. During World War II and the Japanese Occupation all game laws were, of course, forgotten and many of the population were forced to kill any wildlife they could in order to survive. Since the war apparently there has been no effective return of game or hunting laws and any effective wildlife conservation consciousness. In the same period the number of firearms in the hands of private citizens has increased greatly, and the Philippines probably has one of the highest percentages of actively armed, non-military citizenry of any country in the world. It also has a numerous well armed military and a variety of law enforcement groups, and considerable numbers of U.S. military personnel stationed in the country. In addition to firearms, dogs and traps of all kinds are very widely used in hunting. Most present "big game hunting" is done at night with spotlights. These factors, combined with the ... impermanence of park, refuge, and forest land, and the very rapidly increasing human population, have resulted in unlimited exploitation of the wildlife and modification of habitats." (2:VI-5)

Protective measures already taken:

Measures proposed:

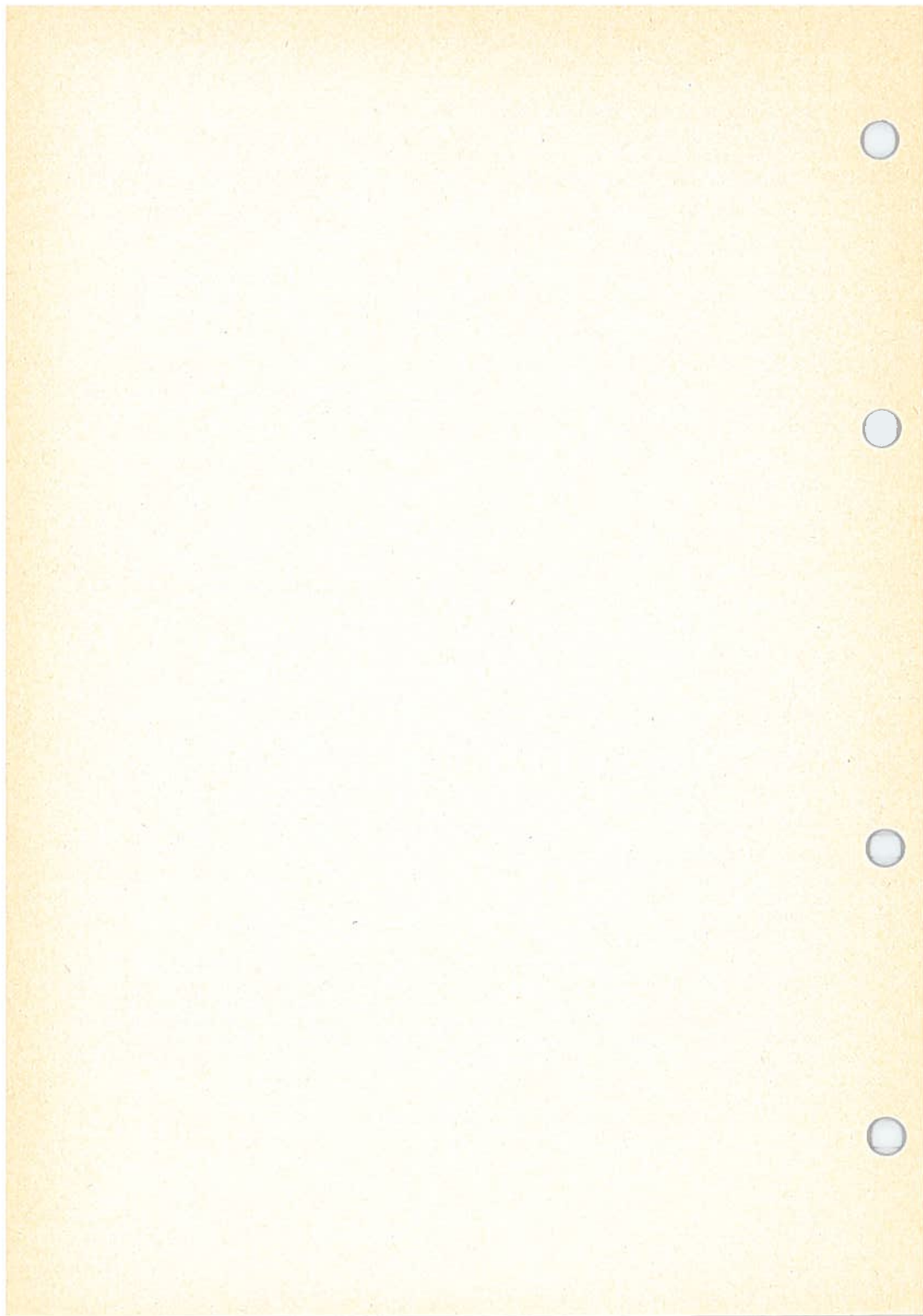
Number in captivity:

Breeding potential in captivity:

Remarks: The specimens from Mount Apo were caught "near hole at base of large tree;" "under grass on edge of lake;" "near log along creek in dense forest with fern undergrowth;" "near boulders in valley covered by ferns." The Mount McKinley specimens were taken "with peanut butter among roots of trees;" "among tangled roots in thick moss." Many were caught in traps baited with bird meat. One stomach examined contained "insects and worms." (1:92-95)

References:

1. Sanborn, 1952
2. Talbot & Talbot, 1964b
3. Walker, 1964



3REY GENTLE LEMUR

Hapalemur griseus (Link, 1795)

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "Fur long and soft, but not specially woolly; face broad, but nose not so extremely wide as in *H. simus*, more tapering; ears short, hairy. Facial vibrissae long, stiff, black, the supraorbital group high up between the ears. Tail long, bushy. General colours greyish- or reddish-green, speckled with black, especially on the crown, back and lateral aspects of limbs, but varying somewhat according to subspecies. Juvenile reddish-yellow below (Forbes)." (1:370-371)

Present distribution: Isolated colonies are still to be found in a few parts of both eastern and western Madagascar. (3) "They are inhabitants of bamboo thickets in forests of the highest altitudes according to Shaw (1879)." (1:369)

Former distribution: "Madagascar; chiefly the eastern moist forested area at comparatively high altitudes, but also the drier parts of the south and west and the central plateau as far east as Lake Alaotra." (1:372)

Status: Rare and declining. (3)

Estimated numbers: Unknown.

Breeding rate in wild: Almost nothing is known about the reproductive habits of this species in the wild. There seems usually to be only a single young which is born from October to January. Gestation period is about 160 days. The young, which is born less developed than the young of *Lemur*, does not cling to the fur of the mother but is left by her in the fork of a tree or a parasitic plant. The mother carries the young in her mouth when she requires to move it. Suckled for about 6 months. (3)

Reasons for decline: This species lives principally in bamboo covered regions usually in fairly humid zones. Destruction of habitat is the principal cause of decline. (3)

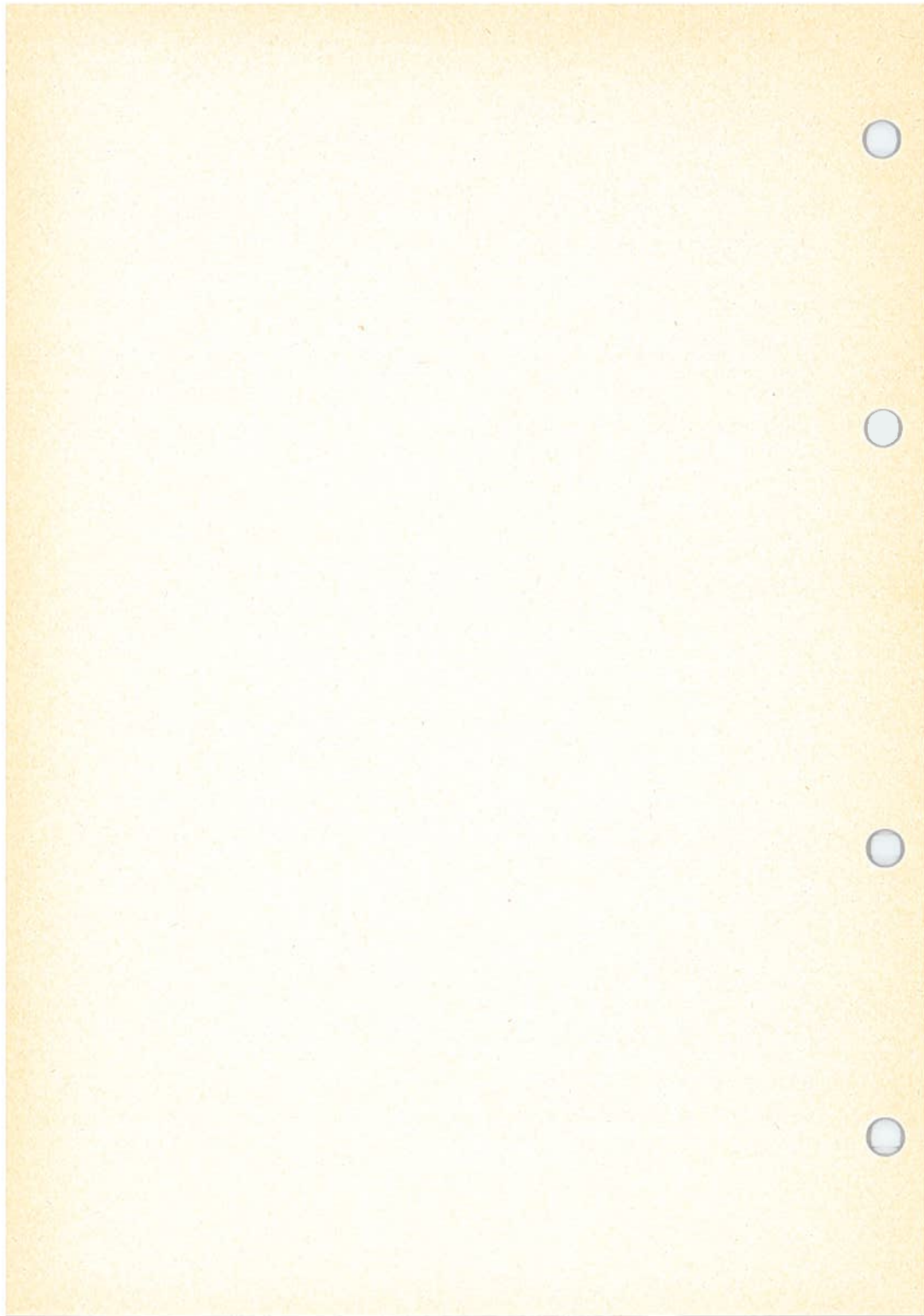
Protective measures already taken: Occurs in the following Réserves Naturelles Intégrales: Tsingy de Bemaraha (149,470 ha.); Massif de Zahamena (66,410 ha.); Massif de Betompona (1,632 ha.); as well as in the Parc National de la Montagne d'Ambre. (3)

Measures proposed: More effective protection is required in existing reserves. (3)

Number in captivity: New Haven Yale 1 ♂, 2 ♀♀; Pretoria 1 ♀. (2:376)
Specimens are occasionally brought to the Tananarive Zoo. (3) They have lived up to 12 years in captivity. (1:370)

Breeding potential in captivity: Two births have been recorded in the Tananarive Zoo on 20th November 1952 and 8th October 1953. (3)

References: 1. Hill, 1953
2. Jarvis, 1965
3. J.J. Petter in litt. 20/8/63



BROAD-NOSED GENTLE LEMUR

Hapalemur simus Gray, 1870

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: Larger than H. griseus, with a distinctive ochraceous pygal patch; tail longer than head and body combined; head rounded with short, broad muzzle. General colour of upper parts dark reddish grey; lower parts mainly sooty-grey, the whole faintly tinged with rufous; throat, chin and chest whitish or yellowish. Feet and hands short and broad with prominent pads. Serrated cheek-teeth adapted for cutting fibrous vegetation. Female with two pairs of mammae, one on abdomen and the other on shoulder. (1:360-374)

Present distribution: Its distribution is very restricted and "it seems to occur only on the shores of Lake Alaotra." (4) "According to Webb, on Lake Alaotra this lemur is confined to reed-beds and floating masses of reeds. It there feeds solely on reeds, especially the cane-like bararata (Phragmites communis), the stems of which are gnawed through at the base to fell them; ..." (1:374)

Former distribution: Unknown, but probably more widespread. "The surface area of Lake Alaotra has been diminishing for several years - likewise the marshy region around it, which was certainly very extensive at one time." (4)

Status: "Very rare in collections and has been neither observed nor captured for many years." An indication of its rarity is that "it is one of the two species of lemur that I have never been able to see alive." (4) Later, in March 1965, Petter wrote: "M. Therezien, of the Malagasy Fisheries Department, informs me that he has recently seen some of them in the lake's reed-beds and bamboo." (4)

Estimated numbers: Unknown.

Breeding rate in wild: "A single young ... is born in a nest, usually in December or January." (2:402) Probably similar to H. griseus. (4)

Reasons for decline: "A species which is probably strictly adapted to a humid habitat. It seems to live permanently over water, which has the advantage of according it effective protection. Reduction of habitat probably accounts for its decline. Specimens are occasionally 'fished' by the local fishermen, who shake the vegetation in order to dislodge the animal." (4) "Natives obtain them by firing the reed-beds." (1:374)

Protective measures already taken: None.

Measures proposed: Systematic research of this interesting animal, coupled with the establishment of a suitable reserve. (4)

Number in captivity: Saarbrücken 1 ♂. (3:376)

Breeding potential in captivity: Unknown.

- References:
1. Hill, 1953
 2. Walker, 1964
 3. Jarvis, 1965
 4. J.J. Petter in litt. 4/5/64 & 1/3/65



BLACK LEMUR

Lemur macaco macaco Linnaeus, 1766

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "... readily recognized by its ear-tufts composed of long hairs fringing the margins and cranial surface of the external ear and continued downwards on the cheeks as far as the angles of the mouth. It is peculiar in the great sexual dichromatism, the males having an exclusively black pelage, whilst the females are some shade of brown or red-brown, relieved by pale ear and cheek tufts ..." (1:402)

Present distribution: Confined to a limited area in the northwest of Madagascar, south of the Bay of Ampasindava, the Lokobé Forest on the Island of Nosy-Bé, and on the Island of Nosy-Komba. (5)

Former distribution: "Madagascar; confined to forested parts of the north-west coastal area and to the neighbouring coastal islands, including Nosy-Bé. Range extends southwards as far as the Bay of Bombétoka." (1:406)

Status: Decreasing. (5)

Estimated numbers: Unknown.

Breeding rate in wild: Mating occurs from April to June; gestation period $4\frac{1}{2}$ months; usually a single young born between August and November, which is suckled for about 5 months. The young of this species is well developed at birth, being covered with fur, eyes open and capable of clinging to its mother. (2:41-42)

Reasons for decline: The large scale destruction of forest has reduced the habitat to a marked extent and the animal is now confined to an area very much smaller than its original range. (5) Hill records that "like several other lemurs, this species is regarded with superstitious awe by the Sakalavas, who object to its being killed or kept in confinement." (1:405) Petter, however, states that it is now hunted by the natives because of its depredations on coffee and cocoa plantations. (5)

Protective measures already taken: The Réserve Naturelle Intégrale du Fôret de Lokobé (1,160 ha.), on the Island of Nosy-Bé, has a few troops. (5)

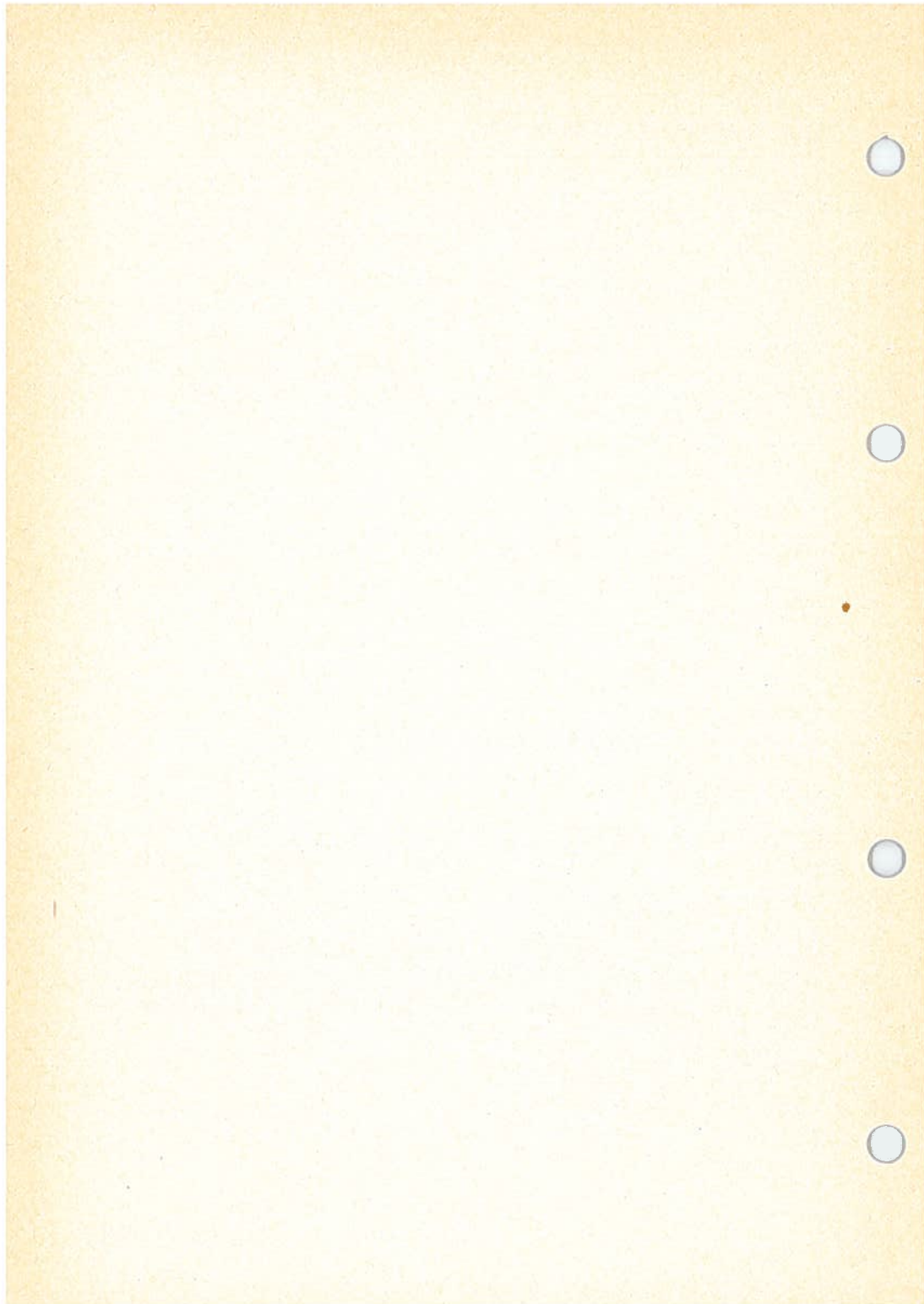
Measures proposed: Protection of the Lokobé Reserve requires to be intensified. (5)

Number in captivity: 14 ♂♂ and 11 ♀♀ in 7 zoos. (4:375) Crandall records one which lived at the New York Zoological Park for more than 16 years. (3:72)

Breeding potential in captivity: Known to reproduce successfully in captivity; quite a number of births have occurred in different zoos. (5)

Remarks: "An essentially arboreal species whose habitat appears to be confined to the topmost branches of forest trees, where it resides in small companies. ... Their progress through the trees is described as being as rapid as the flight of a bird (Pollen, 1868). When followed, they elude pursuit by falling vertically to the ground as if dead, but meanwhile make off in the undergrowth to some distant tree." (1:405)

- References:
1. Hill, 1953
 2. Petter, 1962b
 3. Crandall, 1964
 4. Jarvis, 1965
 5. J.J. Petter in litt. 20/8/63



RED-FRONTED LEMUR

Lemur macaco rufus Audebert, 1799

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "A large race characteristic of the drier western parts of Madagascar. The most distinctive feature of this race is the reddish bar across the forehead of the male. Both sexes present conspicuous white supraorbital patches, but otherwise they differ in ground colour, the males being grey and the females rufous." (1:416-417)

Present distribution: The drier western coastal regions of Madagascar from the vicinity of Lake Kinkony in the north to Analavelona in the south. Also found in the vicinity of the Menarahaka River in the southeast of the island. Within this range there are only four areas in which reliable sightings have been made in recent years. (4)

Former distribution: An extensive range covering the greater part of Madagascar including the whole of the central plateau, but excluding the extreme north and a relatively narrow strip on the east coast. (4)

Status: Thirty years ago L.m. rufus was regarded as one of the more common lemurs. Since then it has undergone a marked decline and is now gravely threatened in three of the four localities in which it is still to be found. (4)

Estimated numbers: Unknown.

Breeding rate in wild: Like the other macaco lemurs, breeding takes place between April and June; gestation period $4\frac{1}{2}$ months; a single young which is born between August and November. Weaning takes place at 5 months of age. (2:41-42)

Reasons for decline: Uncontrolled destruction of the forest habitat is the principal reason for the decline of this subspecies. (4)

Protective measures already taken: None.

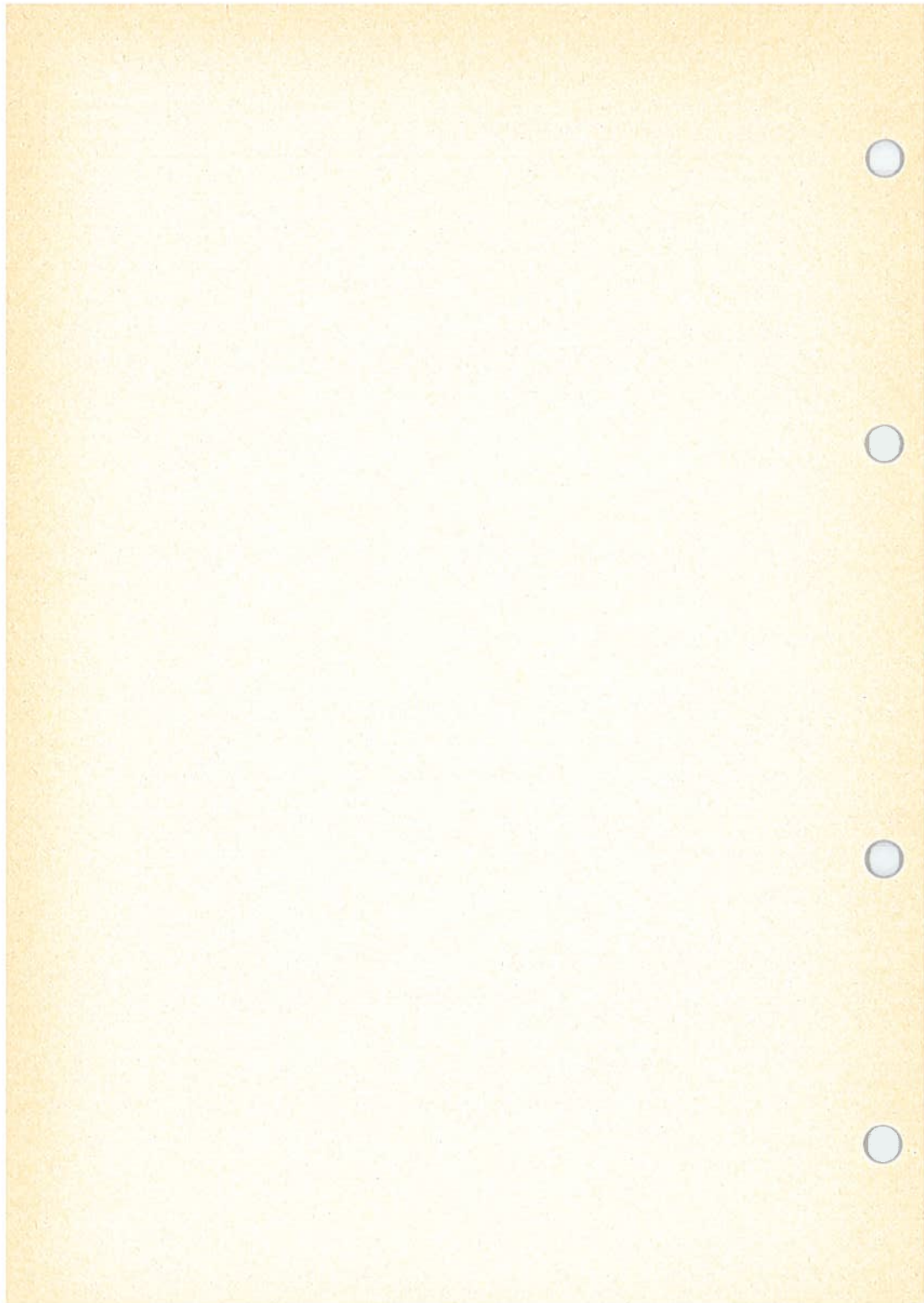
Measures proposed: None.

Number in captivity: Chicago Brookfield U.S.A. 1 ♂; Paris Museum 1 ♀; Philadelphia USA 1 ♂, 1 ♀; total 2 ♂♂, 2 ♀♀ in 3 zoos. (3:376)

Breeding potential in captivity: Breeds well in captivity. (4)

References:

1. Hill, 1953
2. Petter, 1962b
3. Jarvis, 1965
4. J.J. Petter in litt. 20/8/63



SCLATER'S LEMUR

Lemur macaco flavifrons (Gray, 1867)

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "Male entirely black, more intense than in L. macaco, fading to maroon on middle of back, limbs and under parts. Iris bluish-green. Ears without tufts, pinkish-flesh colour. Hair on crown upstanding to form a short crest. Length of head and body 410 mm. (16 in.); tail 508 mm. (19 in.). Female pelage red-brown above, darker on the hinder parts; muzzle dark red-brown; circumference of face, sides of chin, throat and chest pale reddish-yellow. Iris grey. Ears without tufts." (1:413)

Present distribution: Occupies a very restricted range in the northwest of Madagascar in the vicinity of Maromandia. (3)

Former distribution: N.W. Madagascar. Limits uncertain but believed to have been confined to a narrow strip of coastal forest extending for about 70 miles northwards from Ampasindava Bay. (1:414 and map p. 412)

Status: Substantially reduced in numbers and continuing to decline. (3)

Estimated numbers: Unknown.

Breeding rate in wild: The mating season is from April to June; gestation period $4\frac{1}{2}$ months; probably like L.m. macaco, a single young, which is born between August and November and weaned at about 5 months. (2:41-42)

Reasons for decline: The range of this lemur has always been restricted, and in recent years the available habitat has been still further reduced by uncontrolled clearing and burning of the forest. (3)

Protective measures already taken: None.

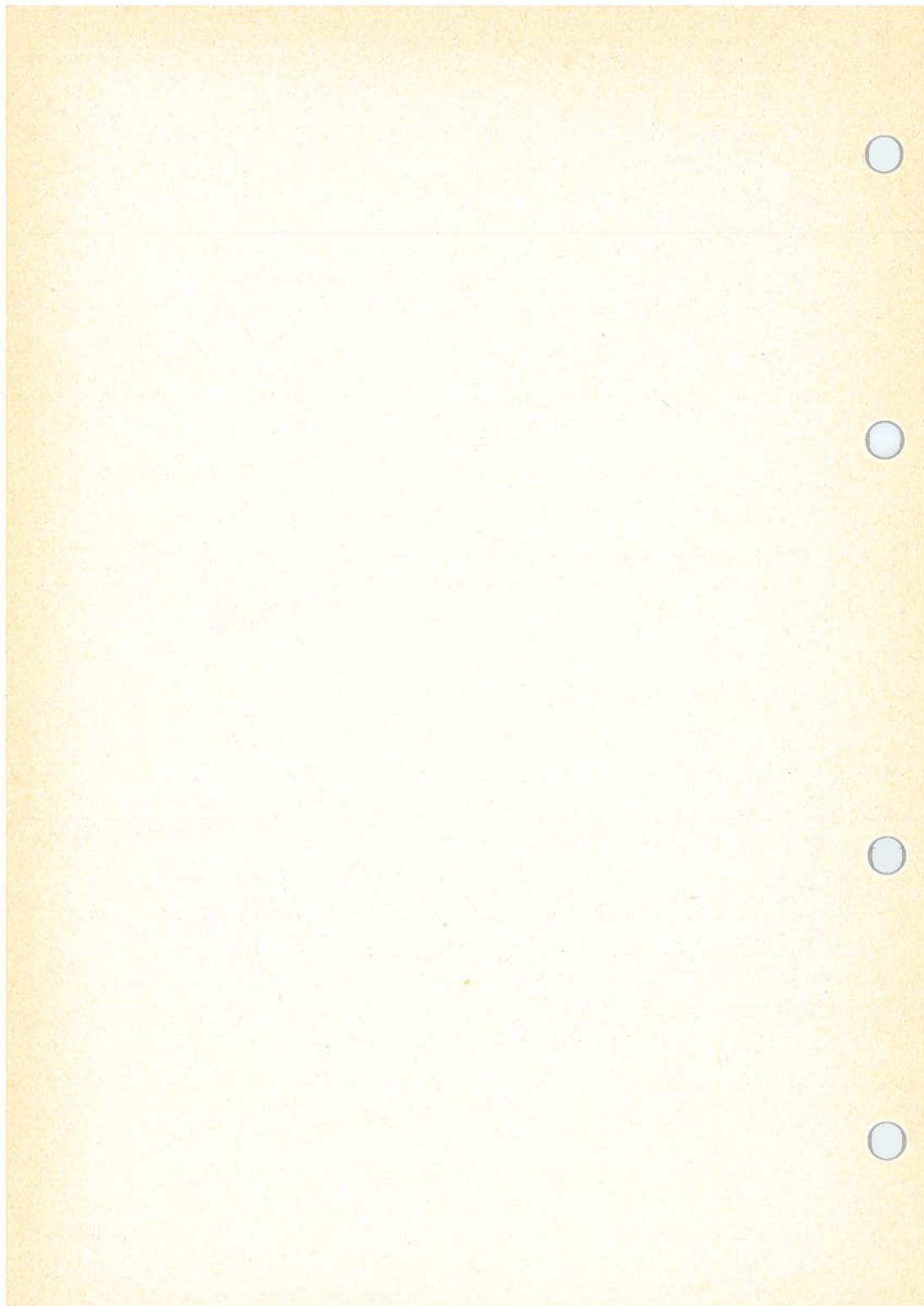
Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: All subspecies of L. macaco do well in captivity and breed readily but very few specimens of L.m. flavifrons have been kept in captivity and none recently. (3)

Remarks: "The two lemurs described as flavifrons and nigerrimus are now [recognised] to be the female and male respectively of the same race ... Earlier views were that the males (nigerrimus) were melanistic mutants of some other race of [macaco] such as albifrons, its near geographical neighbour, whilst the females (flavifrons) were supposed by Schwarz to be an extreme colour-phase of collaris." (1:413)

- References:
1. Hill, 1953
 2. Petter, 1962b
 3. J.J. Petter in litt. 20/8/63



SANFORD'S LEMUR

Lemur macaco sanfordi Archbold, 1932

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "Similar to L.f. albifrons from the region of the Bay of Antongil, but distinguished by the presence, in the males, of short, white ear-tufts, by the whitish hairs of the head being less in evidence, by the generally lighter colour of the pelage and by the absence of any reddish tinge in the females. This race lacks the great sexual dichromatism of L.f. flavifrons." (1:414)

Present distribution: Restricted to the rain forest of Mont d'Ambre, in the extreme north of Madagascar. (3)

Former distribution: Believed to have been the same. (1:414)

Status: Rare and decreasing. (3)

Estimated numbers: Unknown. (3)

Breeding rate in wild: The mating season is from April to June and a solitary young is born between August and November after a gestation period of $4\frac{1}{2}$ months. (2:41)

Reasons for decline: This lemur has always been confined to a very restricted region and in recent years its habitat has been still further reduced through burning and felling of the forest. (3)

Protective measures already taken: The Parc National de la Montagne d'Ambre embraces part of the range of this race. (3)

Measures proposed: None.

Number in captivity:

Breeding potential in captivity: Doubtless similar to the nominate race. (3)

- References:
1. Hill, 1953
 2. Petter, 1962b
 3. J.J. Petter in litt. 20/8/63



MONGOOSE LEMUR

Lemur mongoz mongoz Linnaeus, 1766

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "The mongoose-lemur exists in two colour phases or mutations, a white-cheeked and a red-cheeked, and these are generally sex-linked, the females being white-cheeked. This is constantly the case in specimens from the Comoros, but not so in those from the mainland. Distinctly smaller than L.m. coronatus and hence the smallest form of the genus. Total length 876 mm.; tail 420 mm." (1:424)

Present distribution: Restricted to two localities in the northwest of Madagascar. No data regarding its present occurrence in the Comoro Islands. (4)

Former distribution: "Anjouan and Mohéli in the Comoro Islands, but not Mayotte. Mainland of Madagascar, along the south bank of the Betsiboka River up to its headwaters, at least as far on to plateau as Ambatondrazaka, Sihanaka country." (1:424)

Status: This lemur has always been uncommon and is now rare. (4)

Estimated numbers: Unknown.

Breeding rate in wild: This lemur, which is much smaller than macaco, probably has a slightly different gestation period. (4) "Reproductive behaviour seems to be much as in the other species of the genus." (1:423)

Reasons for decline: Extensive and uncontrolled destruction of the habitat accounts for the decline of this subspecies. (4)

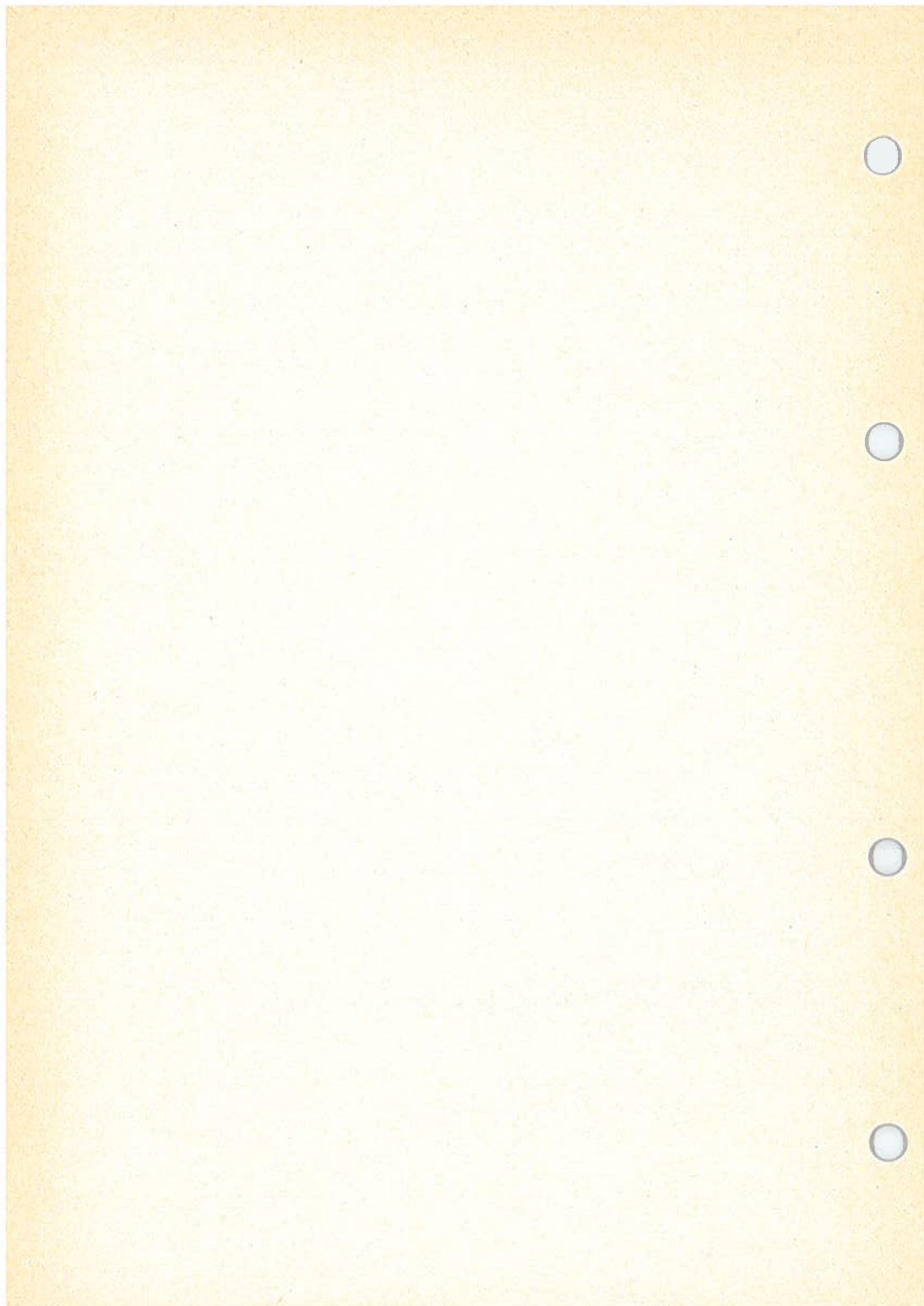
Protective measures already taken: This race occurs in two Réserves Naturelles Intégrales; Plateau de l'Ankarafantsika (67,000 ha.) and Tsingy de Namoroka (5,900 ha.). (4)

Measures proposed: The Ankarafantsika Reserve is of superlative interest and re-enforcement of protective measures is particularly urgent. (4)

Number in captivity: 16 ♂♂ and 12 ♀♀ in 12 zoos (race not specified). (3:376)

Breeding potential in captivity: This species lives very well in captivity but breeds less readily in zoos than macaco. (4)

- References:
1. Hill, 1953
 2. Petter, 1962a
 3. Jarvis, 1965
 4. J.J. Petter in litt. 20/8/63



CROWNED LEMUR

Lemur mongoz coronatus Gray, 1842

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "Larger than typical mongoz (subad. male, total length 810 mm., tail 445 mm.), but, like it, occurring in two colour phases, red-cheeked and white-cheeked, which appear to be consistently sex-linked, males being red- and females white-cheeked; but the males differ from those of typical mongoz in having a black crown-patch, whilst the cheeks of the female are not pure white, and the blackish crown-patch or bar found in the female of mongoz is here absent. The tail in the female coronatus is reddish instead of blackish, as in mongoz." (1:425)

Present distribution: Confined to the northeast of Madagascar. (4)

Former distribution: The savannah and dry bush regions of northeastern and northwestern Madagascar, north of the Bay of Bombétoka on the west coast and the Bay of Antongil on the east coast, north as far as Mt. d'Ambre where it was found on the dry, forested slopes up to an altitude of about 800 meters, although it did not occur in the humid forest on the summit. (1:425)

Status: 25 years ago this lemur was frequently captured but it has now become rare. (4)

Estimated numbers: Unknown.

Breeding rate in wild: This lemur is much smaller than macaco and probably has a slightly different gestation period. (4) "Mothers with single young ones were observed by Rand in November ..." (1:426)

Reasons for decline: The severe reduction of the habitat as a result of burning and clearing the forests has brought about a rapid decline of this subspecies. (4)

Protective measures already taken: The Parc National de la Montagne d'Ambre embraces part of the range of this race. (4)

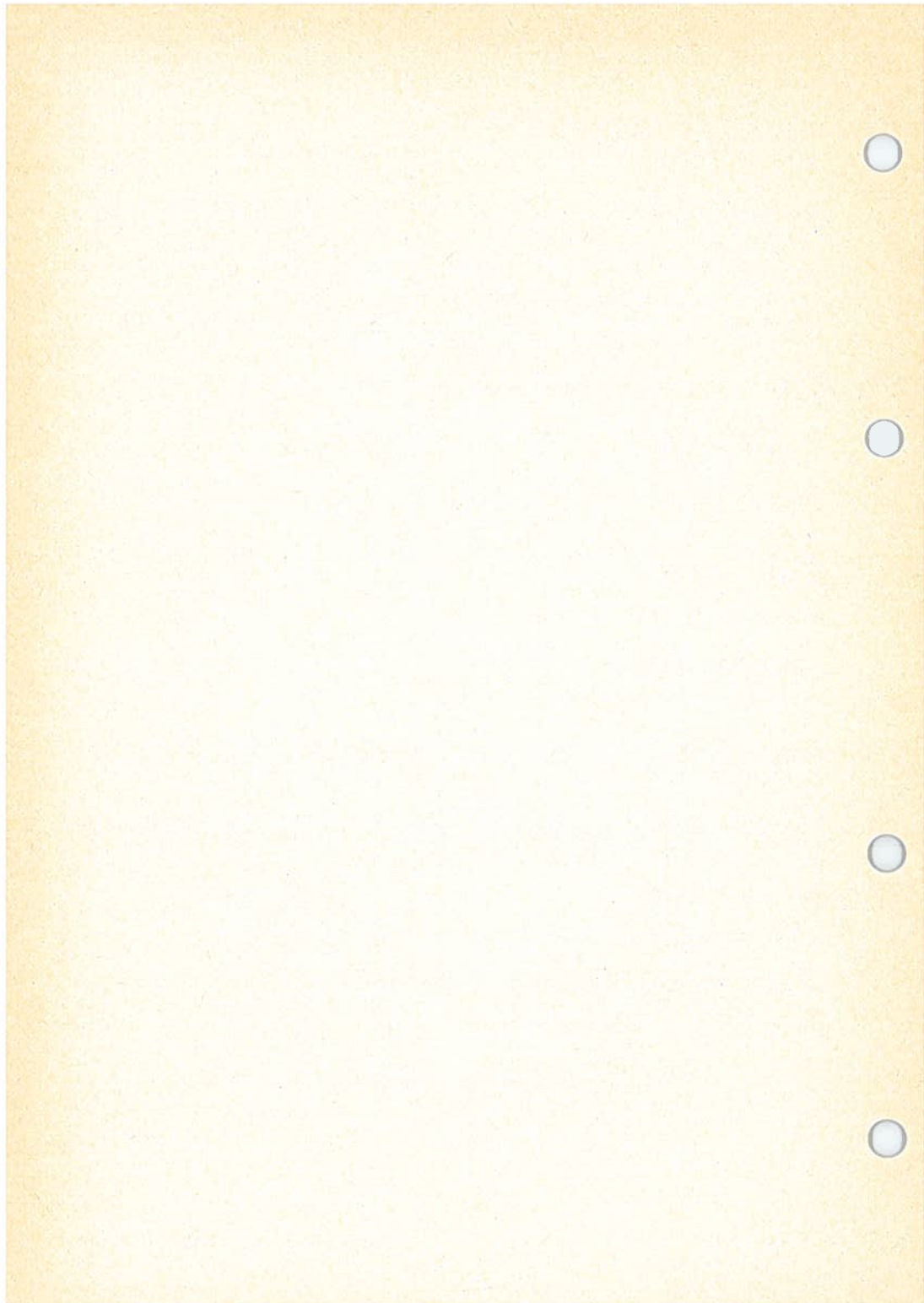
Measures proposed: None.

Number in captivity: Saarbrücken, Germany 2 ♂♂. (3:376)

Breeding potential in captivity: Poor. (4)

References:

1. Hill, 1953
2. Petter, 1962a
3. Jarvis, 1965
4. J.J. Petter in litt. 20/8/63



RED-TAILED WEASEL LEMUR

Lepilemur mustelinus ruficaudatus A. Grandidier, 1867

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "Snout short, conical; ears ovate, short-haired, exposed. General colour of upper parts pale reddish-grey; top of head dark greyish-brown; shoulders and lateral surfaces of arms reddish-brown; lateral aspect of hind-limbs pale grey, washed with brown on lateral side of thigh above knee; chin and pectoral region grey; rest of under parts, including aspects of limbs, white or yellowish-white; hands reddish-brown; feet paler brown, with only toes whitish. Tail reddish-brown, darker than rump; long, thicker distally, the same length as head and body (280 mm.)." (1:451)

Present distribution: The western forests of Madagascar from the vicinity of Narinda Bay in the north to the Onilay River in the south. (2: Map 2)

Former distribution: "Madagascar; forested regions of the west coast, from the extreme north, southwards along the south-west, south and south-east coasts as far as Fort Dauphin; but not extending on to the central plateau. Nosy-bé Island." (1:450)

Status: At one time fairly common and widely distributed but now substantially reduced and continuing to decline. (3)

Estimated numbers: Unknown.

Breeding rate in wild: "The female brings forth a single young one about September. Kaudern collected gravid females in June, August and September and newly-born youngsters in October. He considers the mating season to be restricted to the latter half of the rainy period and possibly the beginning of the dry season in north-west Madagascar. At the time of parturition a nest is said to be made within a hollow tree." (1:446)

Reasons for decline: "Whilst curled up asleep in the daytime they are often captured by the natives and killed by a blow on the head from a stick. They are thereafter eaten; the flavour of the flesh is said to be delicate on account of the animal's exclusively vegetarian diet." (1:446) Direct destruction by man, while serious, is probably only a contributory factor and the principal reason for decline is the widespread destruction of the forested habitat through uncontrolled burning and clearing. (3)

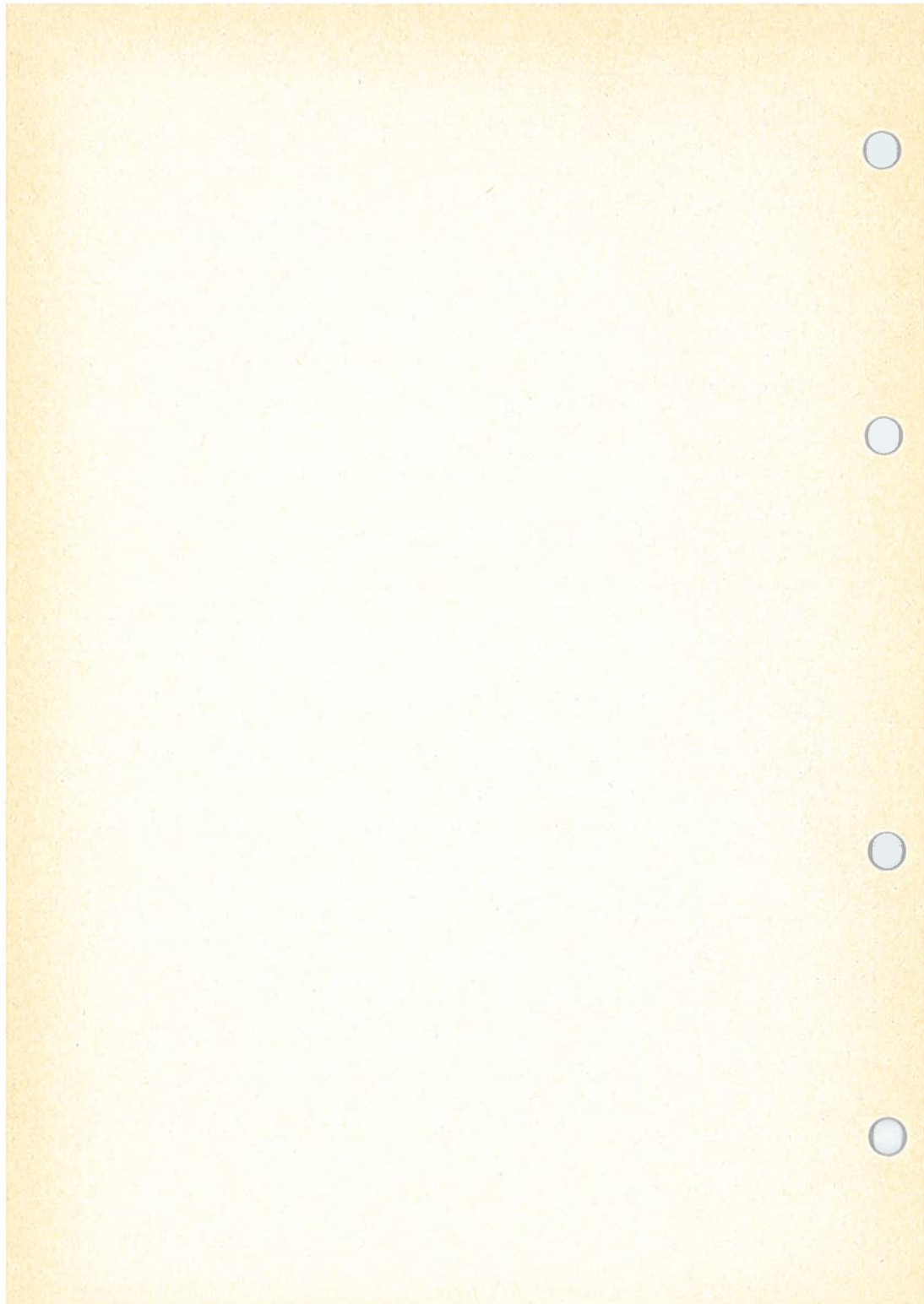
Protective measures already taken: Found in several reserves, notably the Ankarafantsika Reserve. (3)

Measures proposed: More effective protection in existing reserves. (3)

Number in captivity: Rarely survives in captivity. (3)

Breeding potential in captivity: Has never bred in captivity. (3)

- References:
1. Hill, 1953
 2. Petter, 1962a
 3. J.J. Petter in litt. 20/8/63



NOSSI-BE WEASEL LEMUR

Lepilemur mustelinus dorsalis Gray, 1870

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: The under parts "are a reddish colour, sometimes toned down, sometimes accentuated with glints of gold; the colour of the head is grey or brownish grey more or less dark, and has a darker stripe, almost always fugitive, going from the vertex to the occipital region." (1:36)

Present distribution: Believed to be confined to the Island of Nossi-Bé, off the northwest coast of Madagascar. (3)

Former distribution: There is no evidence that this subspecies occurred on the mainland of Madagascar. (3)

Status: An interesting insular subspecies whose existence is linked to that of the forest of Lokobé, where it is common. (3)

Estimated numbers: Unknown.

Breeding rate in wild: Gestation period $4\frac{1}{2}$ months. A single young born September to November. The young, which at birth has its eyes open and is covered with fur, is very mobile and capable of climbing beside its mother or of clinging to her fur. The mother frequently leaves the young clinging to a branch or else jumps with it in her mouth. Weaned at about 4 months, but appears to remain with its mother for about a year. Fully mature at about 18 months. (2:76-84)

Reasons for decline: Destruction of forest on the island of Nossi-Bé. (3)

Protective measures already taken: The establishment of the very attractive Réserve Naturelle Intégrale Forêt de Lokobé, a small reserve of 1,160 ha. (3)

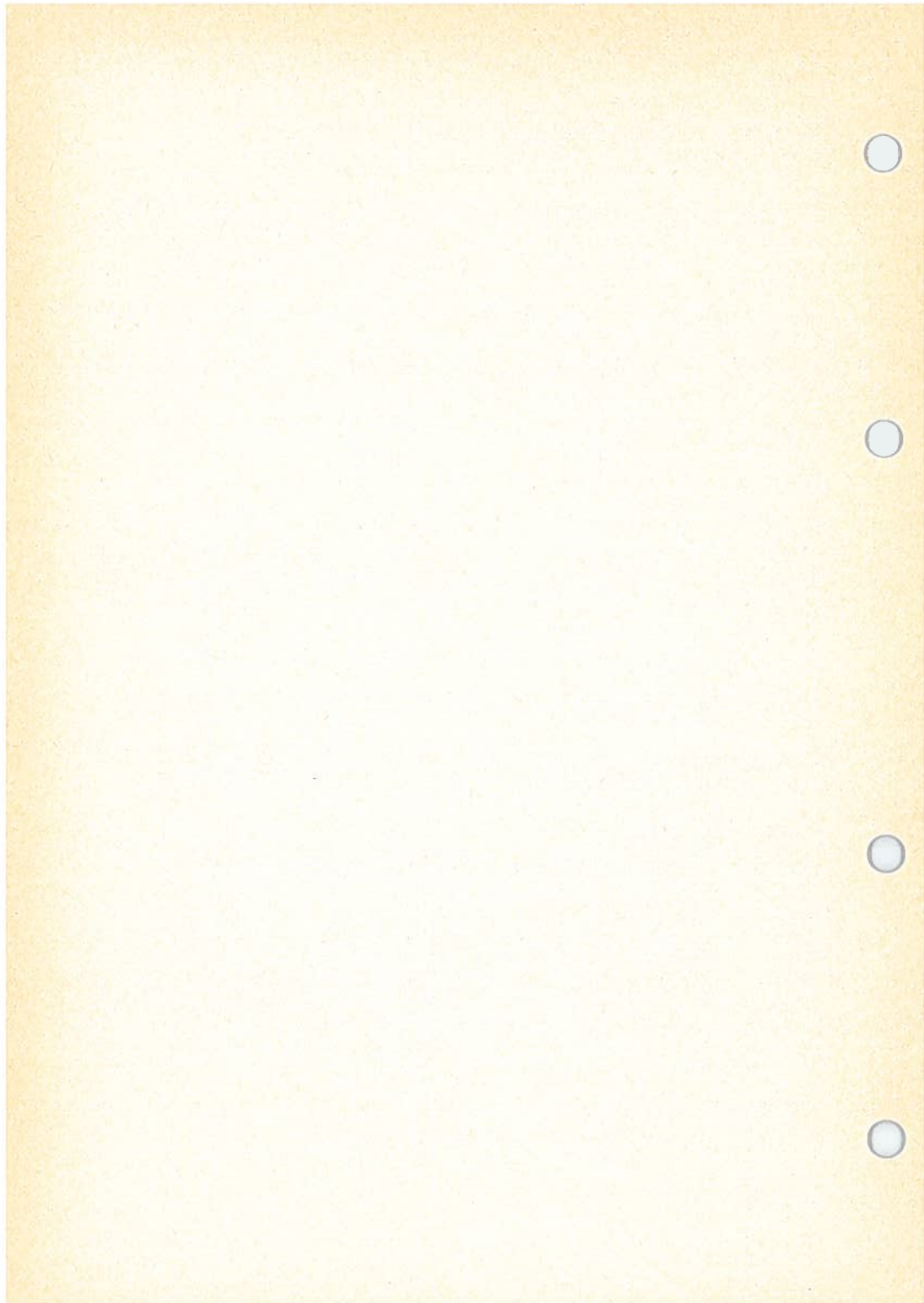
Measures proposed: More effective supervision of the reserve, the future of which it is essential to secure. Funds are required for the proper administration of this important sanctuary. (3)

Number in captivity: None.

Breeding potential in captivity: Difficult to maintain in captivity. One birth has been recorded at Tananarive Zoo. (2:84)

Remarks: This essentially arboreal and nocturnal subspecies is more or less active through the night although rarely going farther than 50 yards from one place, to which it returns at dawn. It is an extremely anti-social animal, each individual having its own night territory which is defended but, in spite of the territorial factor, individuals are never far from others of their kind. The daytime is spent rolled up in a ball among leaves on the ground (contrary to other races of Lepilemur which always spend the day in holes in trees), a habit which is perhaps permitted by the absence of predatory mammals on the island. (2:76-80)

- References:
1. Petit, 1933
 2. Petter, 1962b
 3. J.J. Petter in litt. 5/4/63



WHITE-FOOTED WEASEL LEMUR

Lepilemur mustelinus leucopus (Forsyth-Major, 1894)

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "Length of head and body 12 in. (c. 300 mm.); tail 10½ in. Differing from typical ruficaudatus chiefly in the feet being wholly white and in the tail being shorter than head and body. General colour of upper parts chinchilla-grey with faint, median dorsal brownish stripe from neck to root of tail; top of head brownish-grey, with darker median stripes; cheeks and chin whitish; ears encircled by broad band of whitish hair. Neck, shoulders, proximal parts of forearms pale rufous; tail greyish, tinged with rufous; under parts and medial aspects of limbs pure white. Ears large, long, membranaceous." (1:451)

Present distribution: A single locality in the extreme southeast of Madagascar between the Manambovo and Mandrare rivers. (2:Map 2)

Former distribution: The dry regions of the extreme south-east of Madagascar. Particularly common near Lake Anongy and Ambovombe. (1:452)

Status: Rare and seriously threatened. (3)

Estimated numbers: Unknown.

Reasons for decline: Widespread destruction of habitat accounts for the decline of this subspecies. (3)

Breeding rate in wild: A single young annually. (3)

Protective measures already taken: None.

Measures proposed: There is an urgent need to create a special reserve along the Mandrare River to protect what remains of the Didierea forest (which is unique to Madagascar) and the fauna it contains. (3)

Number in captivity: None.

Breeding potential in captivity: There are no records of this lemur having bred in captivity. (3)

Remarks: Almost nothing is known of these extremely attractive little lemurs. They inhabit holes in trees and being exceptionally inquisitive peep out at passers-by. When they emerge from their holes they stand quite still and can easily be caught. (1:451-452)

References:

1. Hill, 1953
2. Petter, 1962
3. J.J. Petter in litt. 20/8/63



FAT-TAILED LEMUR

Cheirogaleus medius E. Geoffroy, 1812

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "Intermediate in size and other characters between Microcebus and Cheirogaleus major. Total length 350 - 425 mm.; tail 150 - 215 mm. Distinguished by broad, cat-like face, the muzzle being very wide in proportion to its length; eyes very large, forwardly directed; ears short and only slightly haired. Pelage variable in colour, greyish or brownish, washed with rufous above; whitish on the under parts. Dark orbital rings and broad median white facial streak distinct. A whitish half-collar on the side of the neck, due to the dorsal extension of the light ventral hairs on the dorsal area, is perhaps the most distinctive external feature." (1:345)

Present distribution: Reliably reported from only two widely separated localities, one in the northwest in the vicinity of the Betsiboka River and the other in the southwest near the Mangoky River but since suitable habitat exists between these two zones the range may be more extensive. (4)

Former distribution: Range uncertain but was recorded from Fort Dauphin in southeastern Madagascar and the Tsiribihina River in the west. (3:346)

Status: Declining and endangered. (4)

Estimated numbers: Unknown.

Breeding rate in wild: Unknown. A larger species, C. major, which occurs in the eastern forests breeds in January and bears two to three young. (4)

Reasons for decline: This species appears to have had a very restricted range and in recent years the extensive destruction of the limited habitat has resulted in a serious decline. (4)

Protective measures already taken: Occurs in the Plateau de l'Ankarafantsika Réserve Naturelle Intégrale (67,000 ha.), but in no other. (4)

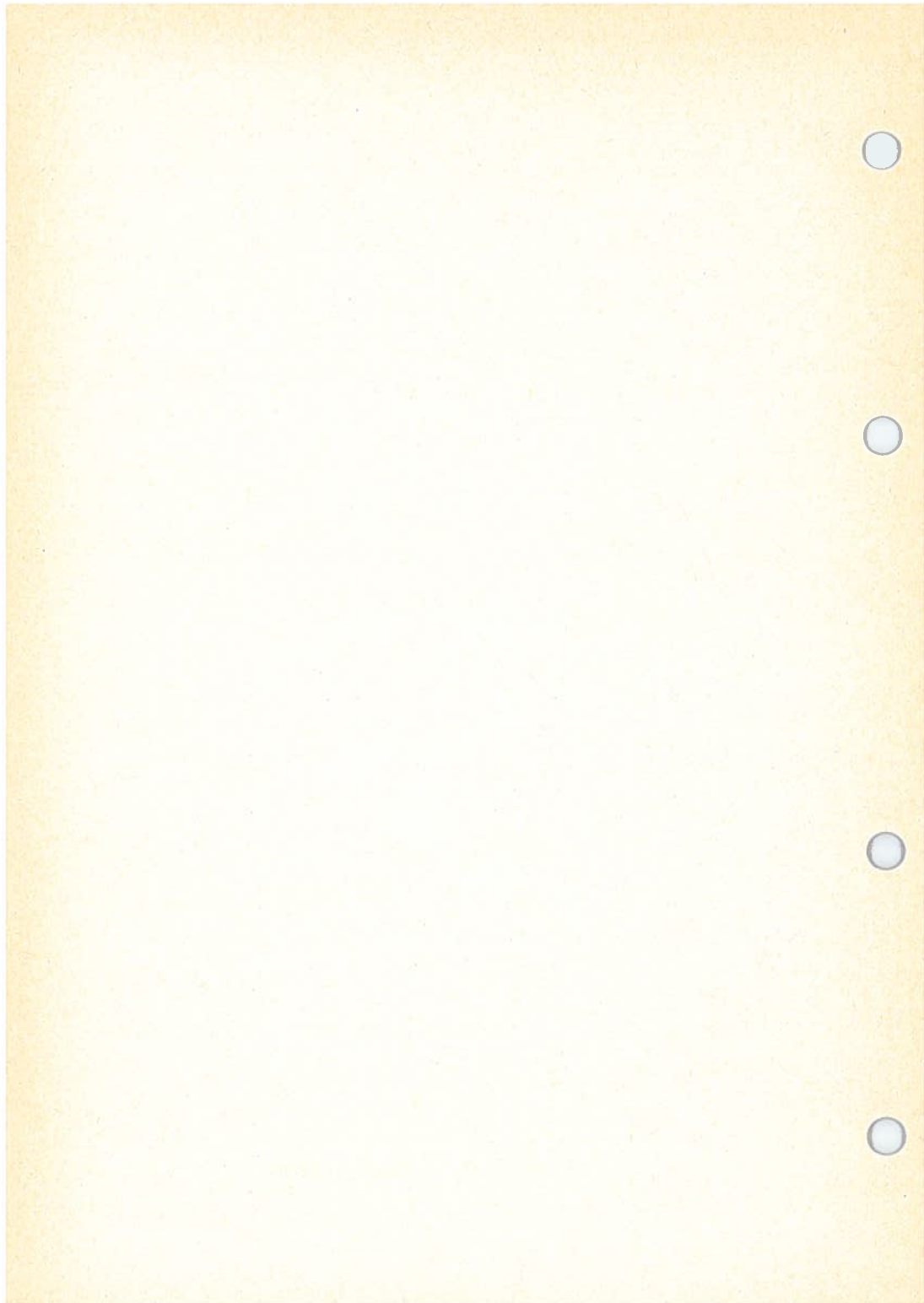
Measures proposed: Protection in the reserve requires to be strengthened. (4)

Number in captivity: Yale University 6; Paris University 3 ♂♂ and 6 ♀♀. (3:375)

Breeding potential in captivity: Has not yet been known to reproduce in captivity. (4)

References:

1. Hill, 1953
2. Petter, 1962b
3. Jarvis, 1965
4. J.J. Petter in litt. 20/8/63 & 14/11/63



COQUEREL'S MOUSE LEMUR

Microcebus coquereli (A. Grandidier, 1867)

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "Distinguished from M. murinus by its much larger size, but referable to Microcebus rather than to Cheirogaleus or Phaner on account of the small size of its foremost upper premolar. Head and body 250 mm., tail 280 mm. Face with rounded outline; muzzle broad and tapering, ears of moderate length, of ovoid outline, almost naked. Pelage thick, woolly; tail with long fur, slightly bushy, hairs more rigid and straight on basal two-thirds, thicker and more divergent in distal third ... General colour of upper parts dark grey washed with rufous, darker along the mid-dorsal line; many hairs with golden tips, producing a general olive-brown effect; ... Chin, throat, breast, belly and medial sides of limbs yellowish-grey." (1:333-334)

Present distribution: Reliably reported from only a single locality in the southwest of Madagascar in the vicinity of Analavelona. (2:Map 1)

Former distribution: "Madagascar; exact range undetermined, but known from the south-west and the north-west (neighbourhood of Bay of Ampasindava), also the 'Island Africaine' (Schlegel and Pollen)." (1:334)

Status: M. coquereli has always been regarded as one of the rarest Madagascan lemurs and is now gravely endangered. (3)

Estimated numbers: Unknown.

Breeding rate in wild: Unknown.

Reasons for decline: As with almost all the west coast species this lemur has declined as a result of destruction of the habitat. (3)

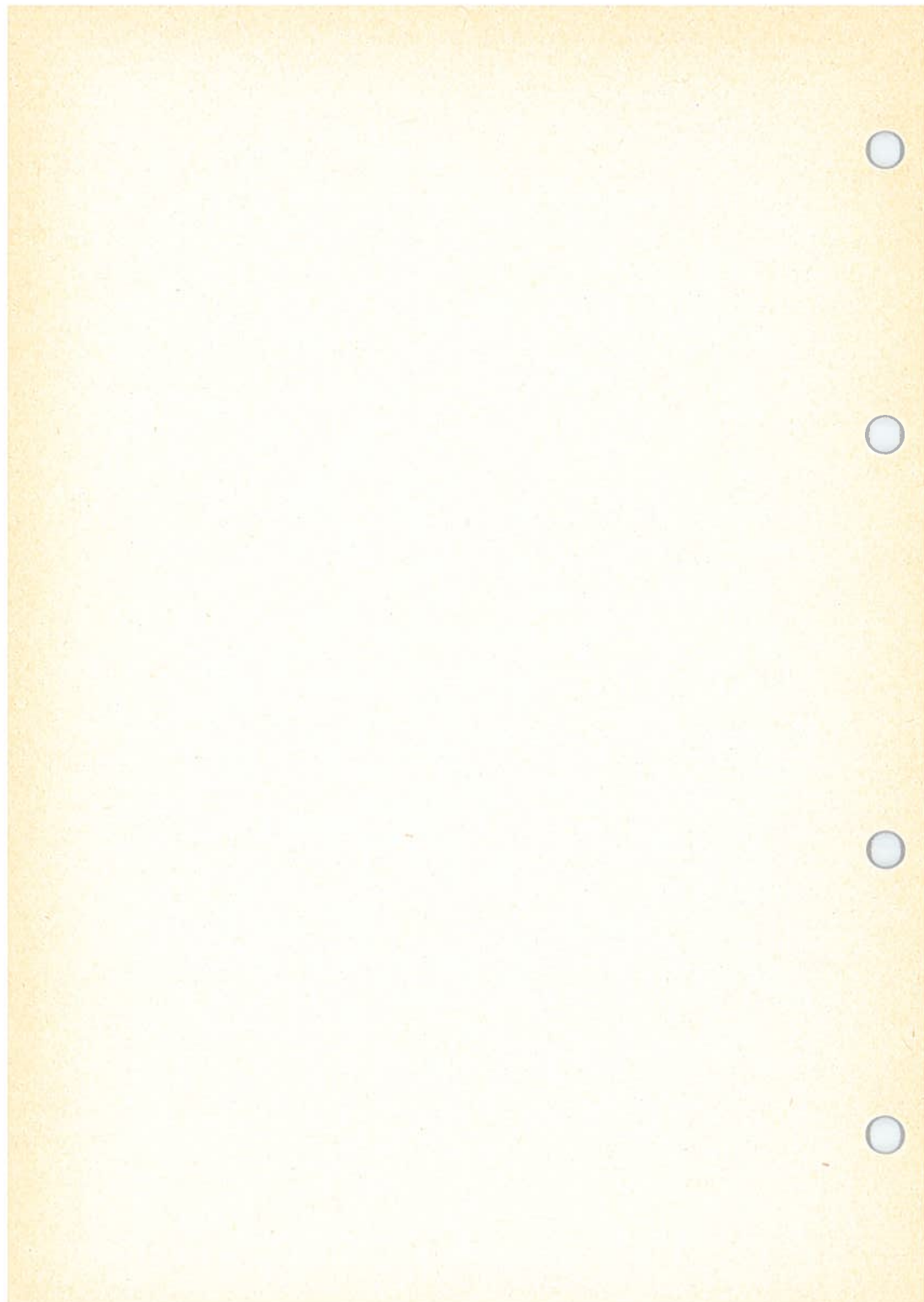
Protective measures already taken: The establishment of two Réserves Naturelles Intégrales, Tsingy de Bemaraha (149,470 ha.), and Lac Tsimanampetsotsa (17,520 ha), in both of which this species is believed to occur. (3)

Measures proposed: Systematic research is required to determine its distribution and to ascertain whether it occurs in any of the established reserves. (3)

Number in captivity: None.

Breeding potential in captivity: There are records of successful breeding at the London Zoo (1885 and 1929), and one specimen is supposed to have lived 15 years in captivity. (1:324-325) However, the identity of these specimens is open to question. None has been captured for several years. (3)

References: 1. Hill, 1953
2. Petter, 1962a
3. J.J. Petter in litt. 20/8/63



FORK-MARKED MOUSE LEMUR

Phaner furcifer (Blainville, 1841)

Order PRIMATES

Family LEMURIDAE

Distinguishing characteristics: "A large species (total length 575-600 mm.; tail 300-350 mm.) of general brownish-grey body colour, chiefly characterized by the broad dark-brown or blackish spinal stripe, which, on the crown, bifurcates; its two divisions produced forwards to become continuous with the dark circumocular rings. Chin and under parts generally yellowish-white, but throat pale rufous or buffy. Tail dark red-brown, darker than the body, with a black or a white tip. On the lateral surfaces of the arms the pelage may deepen to chestnut." (1:350-351)

Present distribution: The species appears to occur in the more humid parts of Mt. d'Ambre where Petter observed it in Dec. 1965 and Jan. 1966. "I have not found the animal in the nearby drier country where other species such as L. mongox are plentiful. If it exists at all in the lower drier forested zones in the north, which we have visited systematically, it must certainly be very rare. In 1957 it appeared to be relatively abundant in the cocoa plantations and adjacent forests around Ampasindava Bay in the Sambirano (opposite the island of Nossi-Bé)." (4) Also recorded from the southwest of Madagascar, near Tulear. (2:Map 1)

Former distribution: "Occurs apparently in both climatic zones of Madagascar but known chiefly from the northern part of the island; region north of the Bay of Antongil in the east, and, in the west, chiefly north of the Bay of Bombétoka, but it has been recorded farther south - from Morondava (west coast), e.g. by Webb. Said by Rand (1935) to be common in the rain-forest on Mt. Amber as well as in gallery-forest in savannah country and in low, dry bush." (1:351)

Status: Once abundant and reported as fairly common up to the 1930s. (1:351) It has undoubtedly declined but there is at present insufficient data on which to gauge its precise status.

Estimated numbers: Unknown.

Breeding rate in wild: Almost nothing is known regarding the reproductive biology of this animal although it is believed to be similar to Cheirogaleus. It is thought that mating occurs in July. (4)

Reasons for decline: Destruction of forest accounts for the decline. (4) "Plantations are now extending over the whole of the island, the destruction of forests by burning and rooting up trees is being pushed ahead in order to provide grazing for huge herds of cattle. So the tree-dwelling prosimians are fast disappearing because their environment is being lost to them." (3:132)

Protective measures already taken: Protected in the Parc National de la Montagne d'Ambre (120,000 ha.). (4)

Measures proposed:

Number in captivity: Rarely found in zoos. (4)

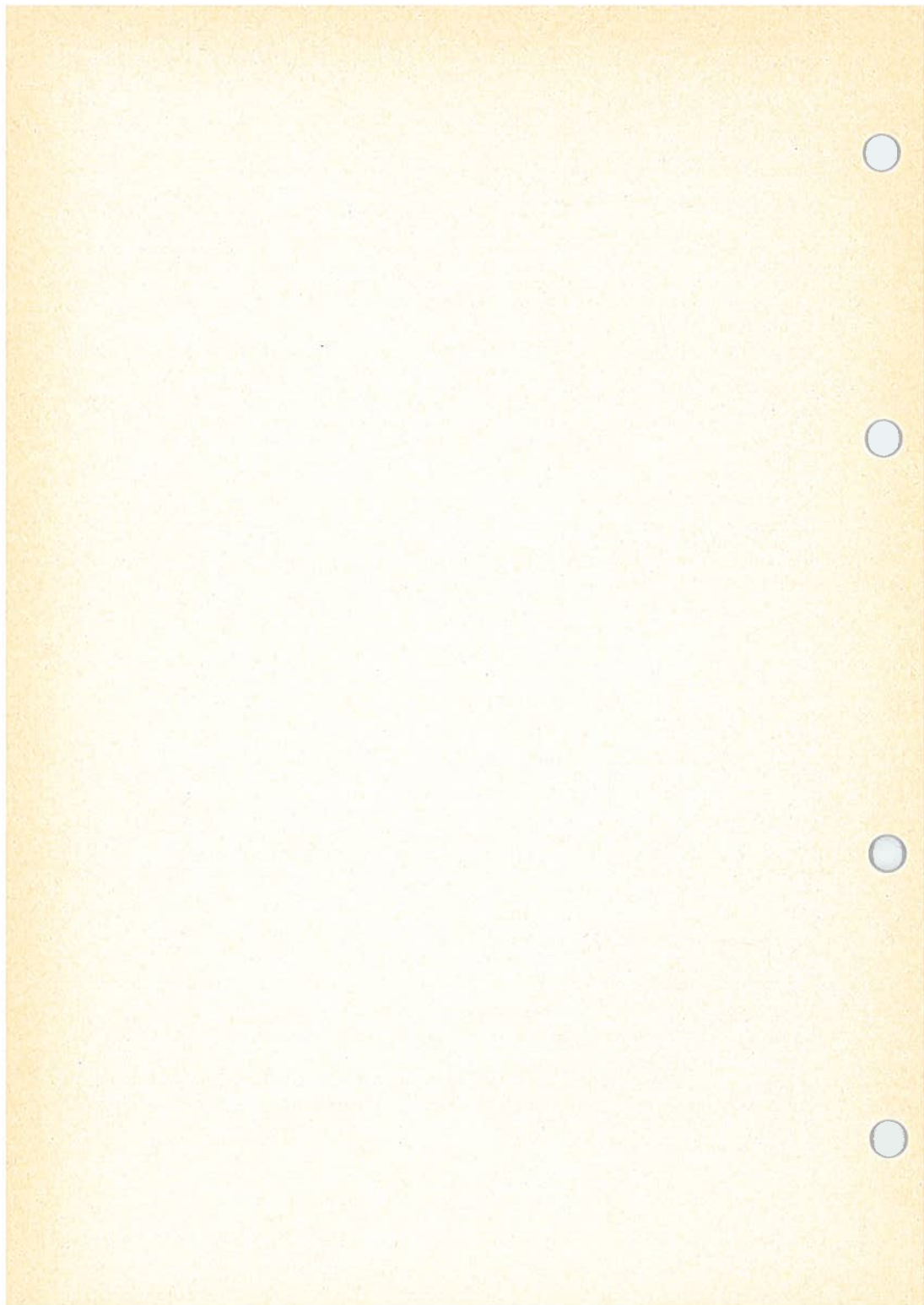
Breeding potential in captivity: Lives quite successfully in captivity but has never reproduced. (4)

Remarks: This nocturnal, arboreal species spends the day in hollow trees, frequently sharing the cavity with bees; hence the native assumption that it robs the hives of honey. (1:350)

References: 1. Hill, 1953
2. Petter, 1962a
3. Basilewsky, 1965
4. J.J. Petter in litt. 20/8/63 & 26/5/66

Status category: 4(a)

Code number: MA/38/PHANE/FUR



WESTERN WOOLLY AVAHI

Avahi laniger occidentalis Lorenz, 1898

Order PRIMATES

Family INDRIIDAE

Distinguishing characteristics: "Body 330 mm. long; tail 195 mm. Upper parts grey with yellowish-brown wash; woolly patch at base of tail thin; tail reddish-brown, more blackish-brown distally; hands and feet yellowish-brown; face whitish; under parts and medial side of arms cream-coloured." (1:595)

Present distribution: Restricted to the northwest coastal forests of Madagascar extending from Bombétoka Bay in the south to Ampasindava Bay in the north. (1:595)

Former distribution: "Confined to N.W. Madagascar in suitable forest. ... Said by natives not to be uncommon on Ankarafantsika and Bongolava Plateaux (Kaudern, 1915). According to Milne-Edwards and Grandidier, it also occurs in the north, between Mont d'Ambre and Anorontsangana, near the Bay of Ampasindava. It probably extends as far south as the Bay of Bombétoka; eastern limit undefined." (1:595)

Status: Because of its retiring and nocturnal habits this subspecies is perhaps less endangered than any of the other western sifakas but, like all the western Strepsirhini, its existence is threatened. The other race, A.v. laniger, which occurs in the eastern part of Madagascar, is still relatively abundant. (2)

Estimated numbers: Unknown.

Breeding rate in wild: The birth of a single young has often been recorded among animals freshly brought to the Tananarive Zoo. Gestation period about 5 months. (2)

Reasons for decline: Although they are preyed upon by natives who snare them for food (1:594), the principal reason for decline is that the available habitat is being rapidly destroyed by uncontrolled clearing and burning. This nocturnal animal is completely arboreal, rarely descending to the ground and will survive only as long as the forest. (2)

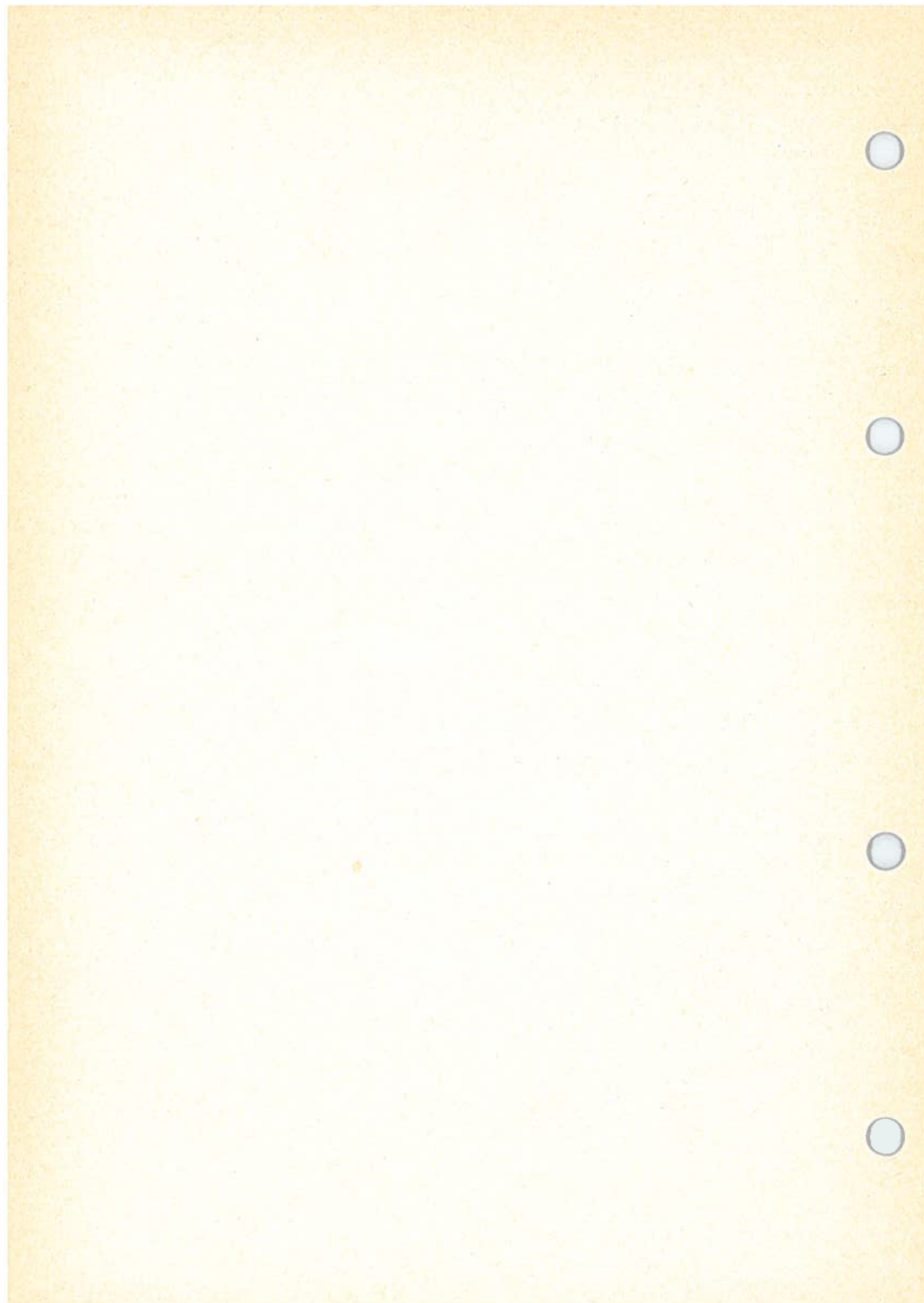
Protective measures already taken: Accorded protection in two Réserves Naturelles Intégrales; Plateau de l'Ankarafantsika (67,000 ha.) and Tsingy de Namoroka (5,900 ha.). (2)

Measures proposed: Protective measures in the Ankarafantsika Reserve require strengthening. (2)

Number in captivity: None. The members of this family are not amenable to confinement, even in their native climate, and few have reached Europe alive. " ... in captivity they soon become apathetic and listless, resulting in early death." (1:554)

Breeding potential in captivity: Poor.

References: 1. Hill, 1953
2. J.J. Petter in litt. 14/2/63 & 20/8/63



VERREAUX'S SIFAKA

Propithecus verreauxi verreauxi A. Grandidier, 1867

Order PRIMATES

Family INDRIIDAE

Distinguishing characteristics: Length of head and body 18", tail 22". Pelage mainly white tinged with yellow; top of head black or blackish-brown and separated from forehead by transverse white band. Cheek-fringe whitish; hands and feet white; sometimes a grayish patch in middle of back. Juveniles entirely white except for dark-brown spot on crown and occasional rufous wash on ventral surface. (1:572)

Present distribution: The southwestern and southern regions of Madagascar from the vicinity of Fort Dauphin in the east to St. Augustin's Bay in the west. (2: Map 5)

Former distribution: The precise limits of its former range are uncertain but were known to include the entire southwestern coastal region of Madagascar from the Tsiribihina River on the west coast to Fort Dauphin in the southeast. No information regarding its distribution inland. (1:572)

Status: Until recently this diurnal, arboreal sifaka was common in most parts of its range but is now greatly reduced and continuing to decline. (4)

Estimated numbers: Unknown.

Breeding rate in wild: Mates from January to March; gestation period about 5 months; a single young is born between May and August; suckled for about 3 - 4 months but commences eating fruit, leaves and bark when approximately 2 months old. Family groups usually consist of 3 or 4 animals - an adult male and female and one or two young. Sexual maturity is reached at about 2 years, at which time the young are ejected from the group. There is evidence to suggest marked territoriality. (4)

Reasons for decline: At one time tribal taboos protected the animal from slaughter but these traditions are no longer effective. Hunting therefore takes a greater toll than formerly, but the greatest source of danger lies in uncontrolled destruction of the forested habitat by clearing and burning. (4)

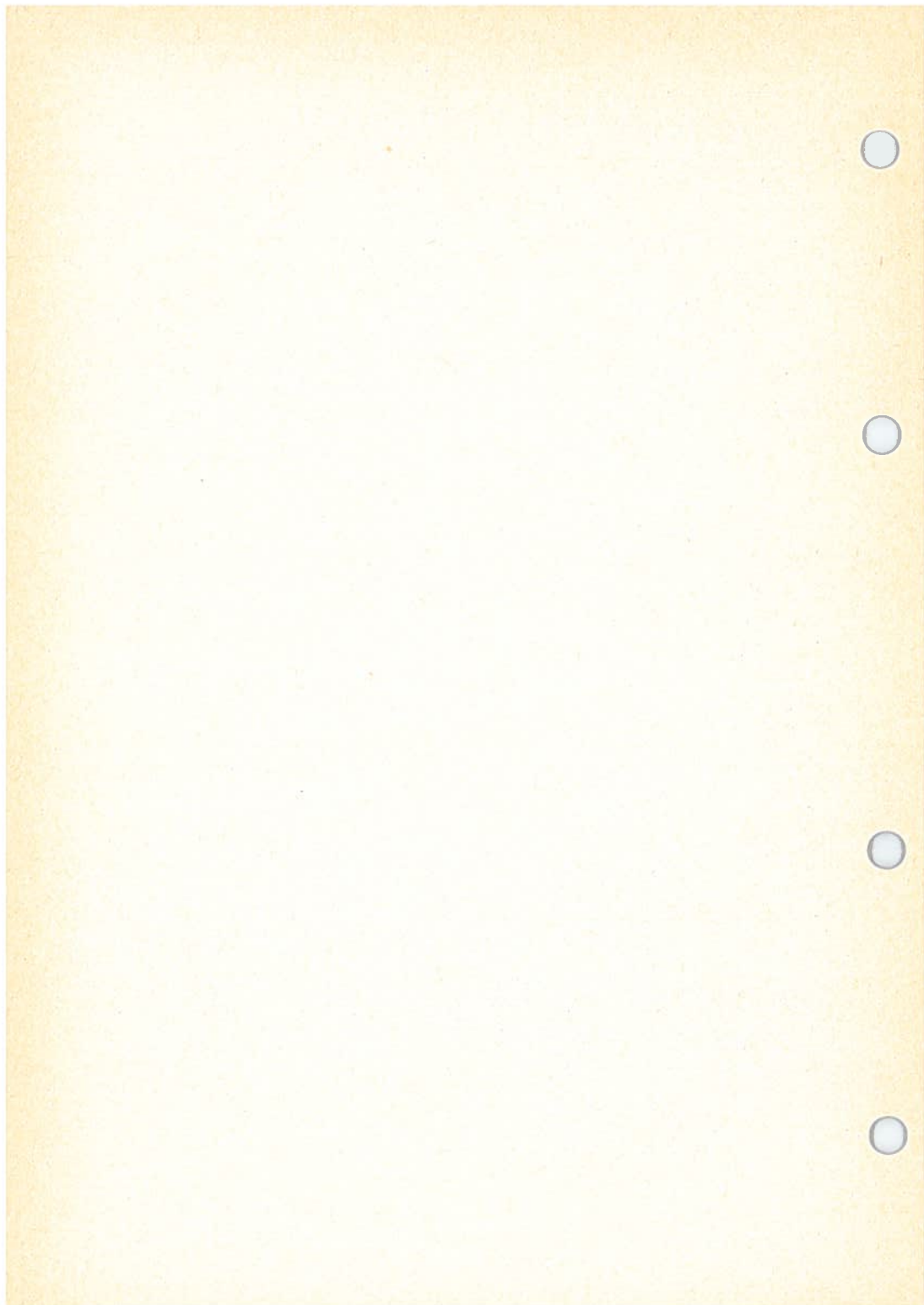
Protective measures already taken: Occurs in Réserves Naturelles Intégrales, Tsingy de Bemaraha (149,470 ha.) and Lac Tsimanampetsotsa (17,520 ha.), and probably in the Massif d'Andohahela Reserve (71,200 ha.). (4)

Measures proposed: It is clear that if destruction of habitat continues at the present rate the sifakas will cease to exist within the foreseeable future. It is essential that adequate areas of forest should be set aside as fully protected sanctuaries while opportunity exists. (4) There appears to be an urgent need for an ecological investigation of the Madagascan Primates with the purpose of drawing up firm recommendations for their long-term protection.

Number in captivity: The Tananarive Zoo has an occasional specimen. (4) New Haven Yale, USA 1 ♂ and 1 ♀ (race not specified). (3:375)

Breeding potential in captivity: They generally do not survive long in captivity but can be raised with special care and even, exceptionally, reproduce (Tananarive Zoo). (4)

- References:
1. Hill, 1953
 2. Petter, 1962a
 3. Jarvis, 1965
 4. J.J. Petter in litt. 20/8/63



COQUEREL'S SIFAKA

Propithecus verreauxi coquereli Milne-Edwards, 1867

Order PRIMATES

Family INDRIIDAE

Distinguishing characteristics: "A very distinct race with pelage almost totally clear white, except for certain areas on the limbs. Skin of face, ears, palms and soles black. A tract of short, white hairs down centre of nose. Front and medial aspects of arms and forearms maroon; medial aspect of thigh and anterior half of its lateral aspect maroon. Hands and feet white. Tail white, becoming greyer distally. There may be a slight buffish wash over loins and rump. Circumanal hairs maroon. The maroon patch on the arms is bordered postaxially by a fringe of long, white hairs." (1:574)

Present distribution: The northwest of Madagascar in the vicinity of the Bay of Mahajamba and the Forest of Ankarafantsika near Ambato Boeni. (3)

Former distribution: "N.W. Madagascar to the north of the area occupied by P.v. coronatus, i.e. limited in the south by the Betsiboka River; extending northwards to the Bay of Narinda and to the River Antamba which opens into it, that is to say, including the basins of the Sofia and Mazamba Rivers; also the island of Nosy Komba. Inland the range extends at least to Ambatondrazaka, south of Lake Alaotra." (1:574)

Status: Declining throughout the greater part of its range. (3)

Estimated numbers: Unknown.

Breeding rate in wild: As with all the Indriidae, a single young is produced at a birth. The gestation period has been estimated at about 4 - 5 months. Mating occurs during the wet season and births occur during the middle of the dry season, infants being found with their mothers from July to October. (1:551-552)

Reasons for decline: Extensive destruction of the forest through uncontrolled clearing and burning has resulted in a substantial reduction of suitable habitat. (3)

Protective measures already taken: Protected in the Plateau de l'Ankarafantsika Reserve (67,000 ha.). (3)

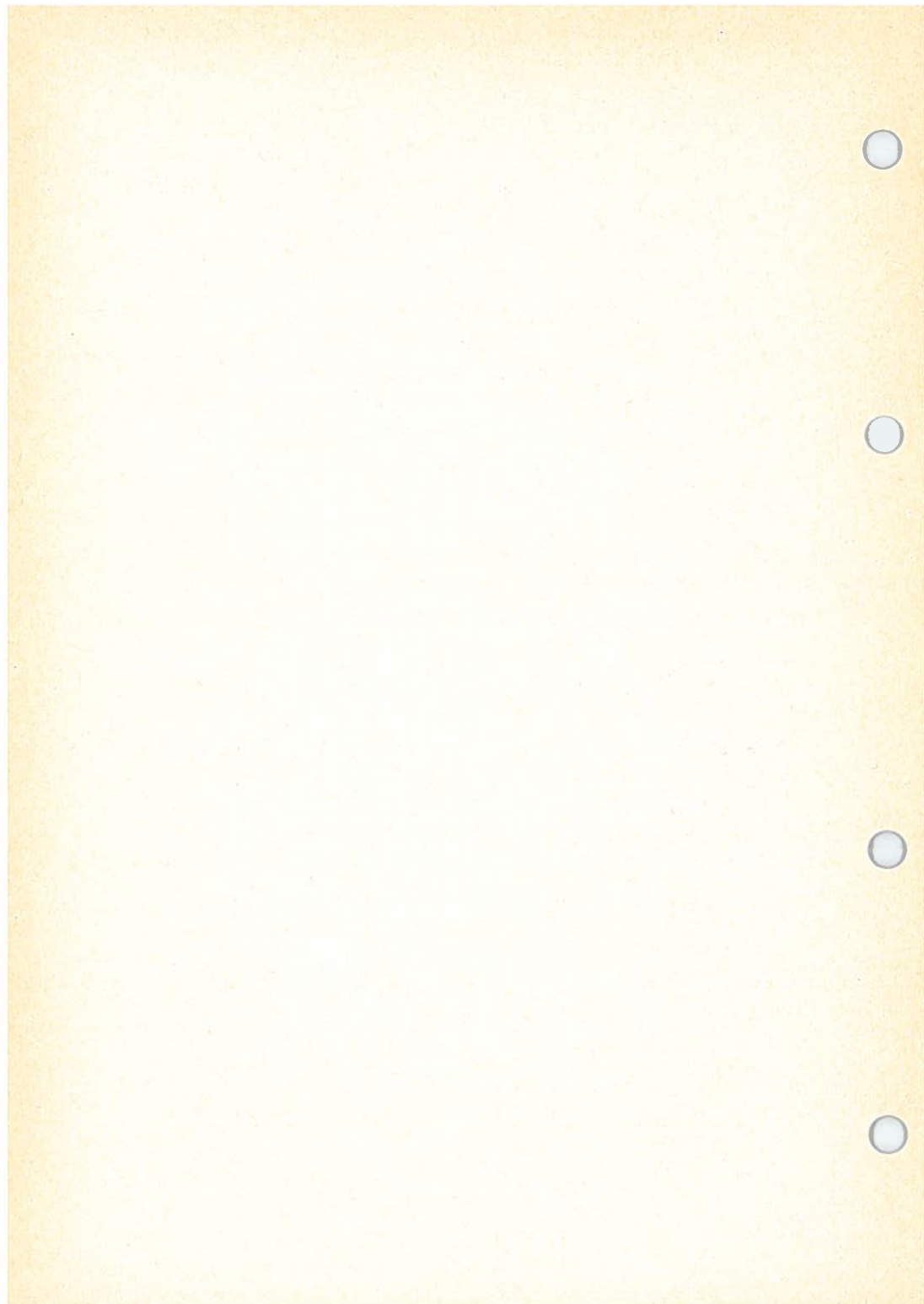
Measures proposed: Strengthening of protective measures in the Ankarafantsika Reserve. (3)

Number in captivity: An occasional specimen is exhibited at the Tananarive Zoo. (3)

Breeding potential in captivity: Like the other sifakas, this animal does not thrive in captivity principally because of its specialised food requirements and its great sensitivity to intestinal infections. (3)

References:

1. Hill, 1953
2. Petter, 1962
3. J.J. Petter in litt. 14/2/63 & 20/8/63



DECKEN'S SIFAKA

Propithecus verreauxi deckenii Peters, 1870

Order PRIMATES

Family INDRIIDAE

Distinguishing characteristics: "An albinistic phase of P. verreauxi with pelage wholly white, but black of naked areas of face, ears, palms and soles retained. The white is washed with yellow or sometimes with ashy-grey on the neck and lateral aspects of limbs, and with rufous (often bright) on the chest. The tail is fulvous at the base, but elsewhere white. Some individuals have the grey encircling the neck, others only a spot on the dorsal aspect. The former are found further inland and the latter only in the coastal area." (1:573)

Present distribution: The same as formerly but within this region recent sightings have been made in only two localities. (3)

Former distribution: Northwestern Madagascar, on the extensive plains situated between the Manambolo and Mahavavy Rivers. Also recorded from Betsina on the south side of Lake Kinkony. (1:573)

Status: This albinistic race is declining and seriously threatened. (3)

Estimated numbers: Unknown.

Breeding rate in wild: Similar to the nominate race; i.e. a single young after a gestation period of approximately 5 months.

Reasons for decline: Like so many of the western forms, P.v. deckenii has declined because of destruction of its habitat as a result of extensive burning and clearing. (3)

Protective measures already taken: Protected in the Tsingy de Namoroka Réserve Naturelle Intégrale (5,900 ha.). (3)

Measures proposed: None.

Number in captivity: The Tananarive Zoo has an occasional specimen. (3)

Breeding potential in captivity: Similar to the nominate race. On three occasions, in 1954, 1955 and 1956, a young hybrid was born at the Tananarive Zoo from a male P.v. coronatus and a female P.v. deckenii. (3)

- References:
1. Hill, 1953
 2. Petter, 1962a
 3. J.J. Petter in litt. 20/8/63



CROWNED SIFAKA

Propithecus verreauxi coronatus Milne-Edwards, 1871

Order PRIMATES

Family INDRIIDAE

Distinguishing characteristics: "Differing from all other races of P. verreauxi in its broader muzzle and wide, naked rhinarium; these parts are black and naked, except that the dorsum nasi has the usual median tract of short, white hairs. Circumfacial fringe black or blackish-brown, extending well back from forehead, sweeping down both sides of ears and meeting on throat; interrupted by short, white fringe on cranial surface of ears. Dark area sharply demarcated from white of nape. Nape, neck and upper parts of body dirty white; limbs and base of tail similar, but washed with rusty-red. No pygal patch definable. Hands, feet and most of tail pure white. Under parts from throat to abdomen rich orange-red, deepest on chest; circumanal hairs reddish-buff. The mahogany-red of the chest may extend a short distance on the medial surface of the arms. The sternal whorl is present in this race (cf P.d. diadema). " (1:574)

Present distribution: Known only from west of the Mahavavy River. (3)

Former distribution: "N.W. Madagascar; confined to the tract between the Betsiboka and Mandazary Rivers. Crossley obtained the more brightly coloured specimens from the southern (inland) part of this area, not far from the great forest of Manerinerina. Kaudern recorded this race from Ankaboka, Katepsy and the Boina mountains." (1:574)

Status: 50 years ago this sifaka was reported to be common but it is now reduced in numbers throughout its range and continues to decline. (3)

Estimated numbers: Unknown.

Breeding rate in wild: Similar to the nominate race; i.e. a single young after a gestation period of approximately 5 months. (3)

Reasons for decline: Widespread destruction of habitat occasioned by uncontrolled clearing and burning. (3)

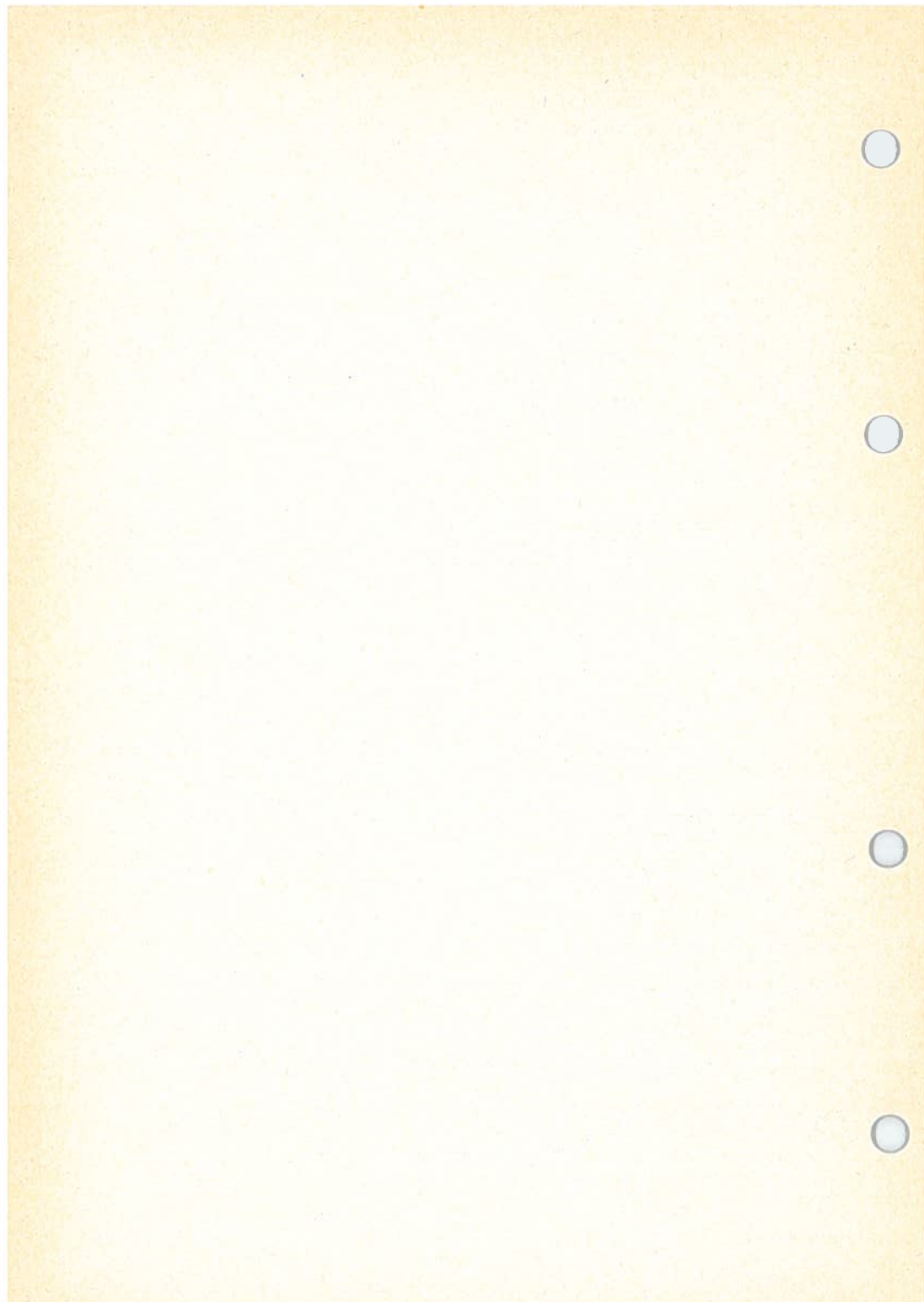
Protective measures already taken: Protected in the Tsingy de Namoroka Réserve Naturelle Intégrale (5,900 ha.). (3)

Measures proposed: None.

Number in captivity: The Tananarive Zoo has an occasional specimen. (3)

Breeding potential in captivity: Similar to the nominate race. On three occasions, in 1954, 1955 and 1956, a young hybrid was born at the Tananarive Zoo from a male P.v. coronatus and a female P.v. deckenii. (3)

References: 1. Hill, 1953
 2. Petter, 1962a
 3. J.J. Petter in litt. 14/2/63 & 20/8/6-



FORSYTH-MAJOR'S SIFAKA

Propithecus verreauxi majori Rothschild, 1894

Order PRIMATES

Family INDRIIDAE

Distinguishing characteristics: "A partly melanistic race ... Face, snout and ears naked, black; face encircled by broad band of long white hairs, joining on throat and mixed with a few dark hairs. Crown and nape black; back and upper rump dark brown; rest of upper parts white, but the large white area on shoulders grizzled with brown hairs; tail white. Limbs white with extensive chocolate-brown areas; on the pectoral limb the anterior and medial surface of brachium, medial surface of forearm, thumb and next two digits are blackish-brown; on the pelvic limb, the medial aspect as far as the heel is dark brown, joining proximally the dark patch on the back over the front edge of the thigh. Under parts, including throat, chest and abdomen, dark brown. Size the same as typical verreauxi, which it approaches most nearly of all the races of this species." (1:573)

Present distribution: Found only in the southwest of Madagascar near Lambormakandro, in the Sakaraha Forest, approximately 130 km. northeast of Tulear. (3)

Former distribution: South-central Madagascar in the 'country of the Antanosy émigrés'. The full extent of the range is not known but is presumed to have included the mountains near Mananasa (23°3'S., 44°50'N.), where Last is known to have collected in 1889. (1:573)

Status: The most localised and the most seriously threatened of all the races of Propithecus. This partially melanistic race is exceptionally localised, although it is interesting to note that it inhabits the same forest as another subspecies, P.v. verreauxi, which has a much wider distribution. (3)

Estimated numbers: Unknown.

Breeding rate in wild: Similar to the nominate race; i.e. a single young after a gestation period of about 5 months. (3)

Protective measures already taken: None.

Measures proposed: Petter considers that it is of the greatest importance to give effective protection to the Sakaraha Forest. He believes that this region may hold the key to the explanation of the remarkable phenomenon of extreme diversity of forms within a relatively small area, from which it might be possible to provide an explanation governing the distribution of the Madagascan fauna. (3)

Number in captivity: None.

Breeding potential in captivity: Doubtless similar to the nominate race. (3)

- References:
1. Hill, 1953
 2. Petter, 1962a
 3. J.J. Petter in litt. 14/2/63 & 20/8/63



INDRIS

Indri indri (Gmelin, 1788)

Order PRIMATES

Family INDRIIDAE

Distinguishing characteristics: Largest living strepsirhines, 3' high; head relatively small; tail a mere stump; all 4 lateral toes united by interdigital webs; fur dense and silky; white triangular rump patch; face, hands and feet black; pelage parti-coloured black, grey and white; predominant colour normally black but individually somewhat variable. (1:595-612)

Present distribution: "Indri is confined to the forests of the eastern volcanic mountain chain of Madagascar, between the Bay of Antongil in the north and the River Masora in the south. The southern limit is about halfway along the eastern coast of the island. ... It extends from sea-level up to 1,800 metres (Rand, 1935), but does not occur on the Ile Sainte Marie." (1:611)

Former distribution: The same.

Status: Decreasing with the loss of indigenous forest. In the same position as most of the other Madagascan species, but its distribution is more restricted than most, which could precipitate its disappearance. (4)

Estimated numbers: Unknown.

Breeding rate in wild: "A single young is born after a gestation period of 60 days." (3:412)

Reasons for decline: Partly through direct destruction by the local people which is very considerable, especially in the region of Maroantsetra, but primarily through reduction of the forested habitat. In particular the number of indris in the central part of the range has diminished drastically in recent years. This has occurred as a result of widespread deforestation and uncontrolled burning of the large number of small forested hills which constitute the eastern forests. At one time a separate troop of indris occupied almost every ridge. (4)

Protective measures already taken: Occurs in two Réserves Naturelles Intégrales; Massif de Betompona (1,632 ha.) and Fôret de Masoala (20,977 ha.) There are also some at the Perinet forestry station, which offers exceptional conditions for observation and study. (4)

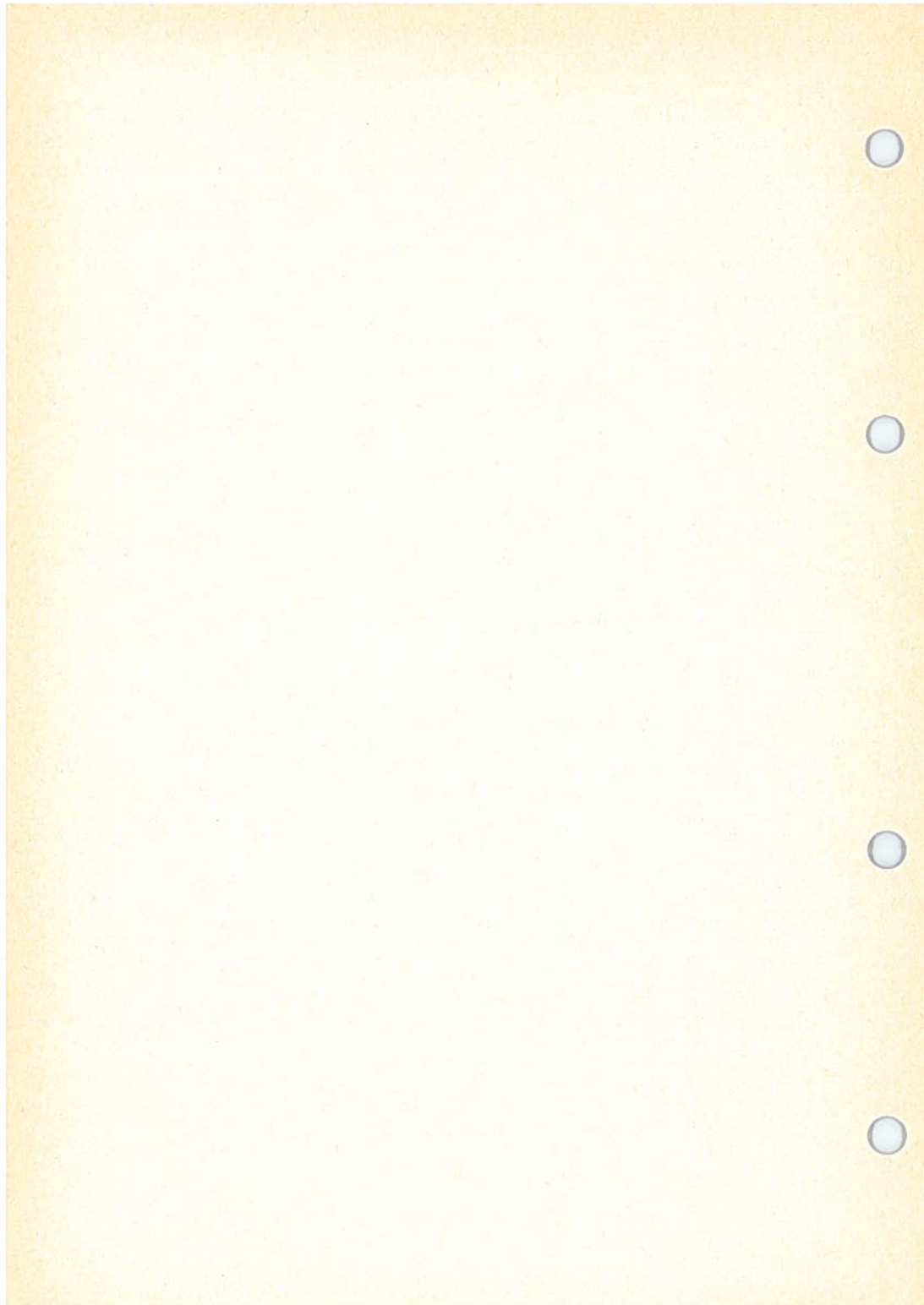
Measures proposed: Protection of the Réserves Intégrales requires enforcement; propaganda needs to be directed at the Government and financial aid is necessary to augment the number of guards and ensure better protection against intruders. The Government of Madagascar should be requested to accord complete protection to the fauna occurring in the forest reserves. (4)

Number in captivity: None.

Breeding potential in captivity: Little data available, but the indris is reported to be extremely difficult to rear and has never reproduced in captivity. (4) 8 or 10 indris which were sent to the Paris Ménagerie in 1939 all died within a month. (1:610)

Remarks: "The most characteristic feature is the loud voice. It is said to be the noisiest of the lemurs, if not the most vocal denizen of Madagascar." (1:610)

- References:
1. Hill, 1953
 2. Petter, 1962a
 3. Walker, 1964
 4. J.J. Petter in litt. 14/11/63



AYE AYE

Daubentonia madagascariensis (Gmelin, 1788)

Order PRIMATES

Family DAUBENTONIIDAE

Distinguishing characteristics: Size of a large cat; long bushy tail; coat coarse, predominantly black; large ears and eyes; fingers elongated and narrow, particularly the third digit; incisors large, curved, rodent-like; canines absent in permanent dentition but present in deciduous dentition. (1:668-669)

Present distribution: The area of distribution of the aye-aye appears to be on the east coast in the forest zone situated between Antalaha (north of Maroantsetra) and Manajary. It has also been found on the northwest coast in a certain area between Ambilobe and Analava (5), but has not been recorded there since 1932. (6)

Former distribution: "In 1914 Kaudern recorded its existence in the Ankarafantsika forest, on the right bank of the Betsiboka, but Lavauden, in 1933, is certain that it no longer existed at that date and we ourselves have been unable to find proof of its possible existence in this region. Decary informed us that he himself found an aye-aye south of Farafangana, on the east coast, which would make the area of distribution of this animal nearly all the east of the island." (2:115)

Status: The sole surviving representative of the family. (1:665)
Extremely rare and decreasing with the destruction of indigenous forest. (5)

Estimated numbers: Possibly not more than 12 - 20 specimens remain. (6)

Breeding rate in wild: "A single young appears to be the rule as in Indridae. Nothing is known of the period of gestation. Kaudern (1914) quotes native authority that young are born in February and March." (1:694)
"The female aye-aye is said by Baron to construct, in a hollow branch or in an angle between a branch and the main trunk, a large, ball-like (2 ft. diameter) nest of rolled-up leaves, ... lined with twigs and dry leaves. The nest has a single opening at the side, and within this she produces her single young one." (1:697)

Reasons for decline: Primarily due to the destruction of the natural habitat. A delicate animal with a low breeding rate. The few aye-ayes occurring here and there along the east coast are particularly endangered where they occupy large trees in the vicinity of villages, on account of the damage they inflict on coconut plantations. (5) "The local people do not actually kill the aye-ayes but do everything possible to drive them away." (6)

Protective measures already taken: None. It occurs in no reserve and its habitat, the coastal forest, has almost entirely disappeared. (4)

Measures proposed: Mr. R. Perraudin, then Director of the Service des Eaux et Forêts of the Republic of Madagascar, proposed establishing a reserve for the aye-aye extending to about 140 ha. situated in the forest of

Ambato Malame in the district of Fénérive, Province of Tamatave, (see WWF Project 14 (e) 7). This decision was taken following the Petter Mission 1956-7, which had recognised the existence of aye-aye in this forest. Later, it was unfortunately decided to make a road through the forest. In December 1963 (Petter Mission) after the construction of the Tamatave-Fénérive road through the forest, no evidence of aye-ayes was found in this reserve. (Nevertheless other nocturnal lemurs, Cheirogaleus and especially Avahi, occur there). "At our request the Director of the Service des Eaux et Forêts, Mr. G. Ramantsoavina, is trying to get the small island of Nosy-Mangabé (in the northeast of Madagascar) declared a Réserve Intégrale, in order to introduce and establish a colony of aye-ayes. In our opinion this is the only measure likely to be effective in safeguarding the species." (5) Nosy-Mangabé is a sacred place, so the local people will not interfere with the animals. (6)

Number in captivity: None. "Unlike the Indriidae, Daubentonia survives readily in captivity ... examples have survived in the London Zoo, one for over 4½ years and another for nearly 9 years. In Paris, specimens have lived for 6 and nearly 8 years. (1:696-697) Crandall quotes several examples of longevity in captivity (3:74), including one which lived at the Zoological Gardens of Amsterdam for more than 23 years. (3:731)

Breeding potential in captivity: "I know of no record of the breeding of aye-aye in captivity." (3:74) "M. Ursch, Director of the Tsimbazaza Zoo, succeeded in keeping a pair of aye-ayes alive for five years, in fact they even reproduced twice." (4:132)

Remarks: "Aye-ayes are essentially nocturnal, arboreal lemuroids with specialized habits, being adapted for a diet chiefly consisting of insects, more especially of wood-boring species, which they remove with the help of the specialized middle finger and the gnawing incisors." (1:665)

- References:
1. Hill, 1953
 2. Petter, 1962b
 3. Crandall, 1964
 4. Basilewsky, 1965
 5. J.J. Petter in litt. 14/11/63 & 25/2/64
 6. R. Paulian in verbis, 4/3/65

WHITE-NOSED SAKI

Chiropotes albinasus (I. Geoffroy and Deville, 1848)

Order PRIMATES

Family CEBIDAE

Distinguishing characteristics: Head and body 360 - 520 mm.; tail 360 to 500 mm.; "shiny black in color. The nose and upper lip are covered with downward-growing, stiff, yellowish-white hairs; the red skin in this area is in sharp contrast to the blackness of the remainder of the body. ... The beard of Chiropotes is well developed and the tail is so heavily furred that it is full and thick." (2:430) "Hairs on crown radiating in all directions from a centre on the vertex, those at sides and back are longer." (1:224)

Present distribution: "Brazil; Upper Rio Tapajoz." (3)

Former distribution: "Not known to have been more extensive than at present." (3)

Status: "A rare species, poorly represented in Museums and Zoological collections. Seldom comes into the live animal market." (3)

Estimated numbers: Unknown. (3)

Breeding rate in wild: "No data available for any of the genus." (3)

Reasons for decline: "Presumably approaching natural extinction from competition with other Primates inhabiting same environment." (3)

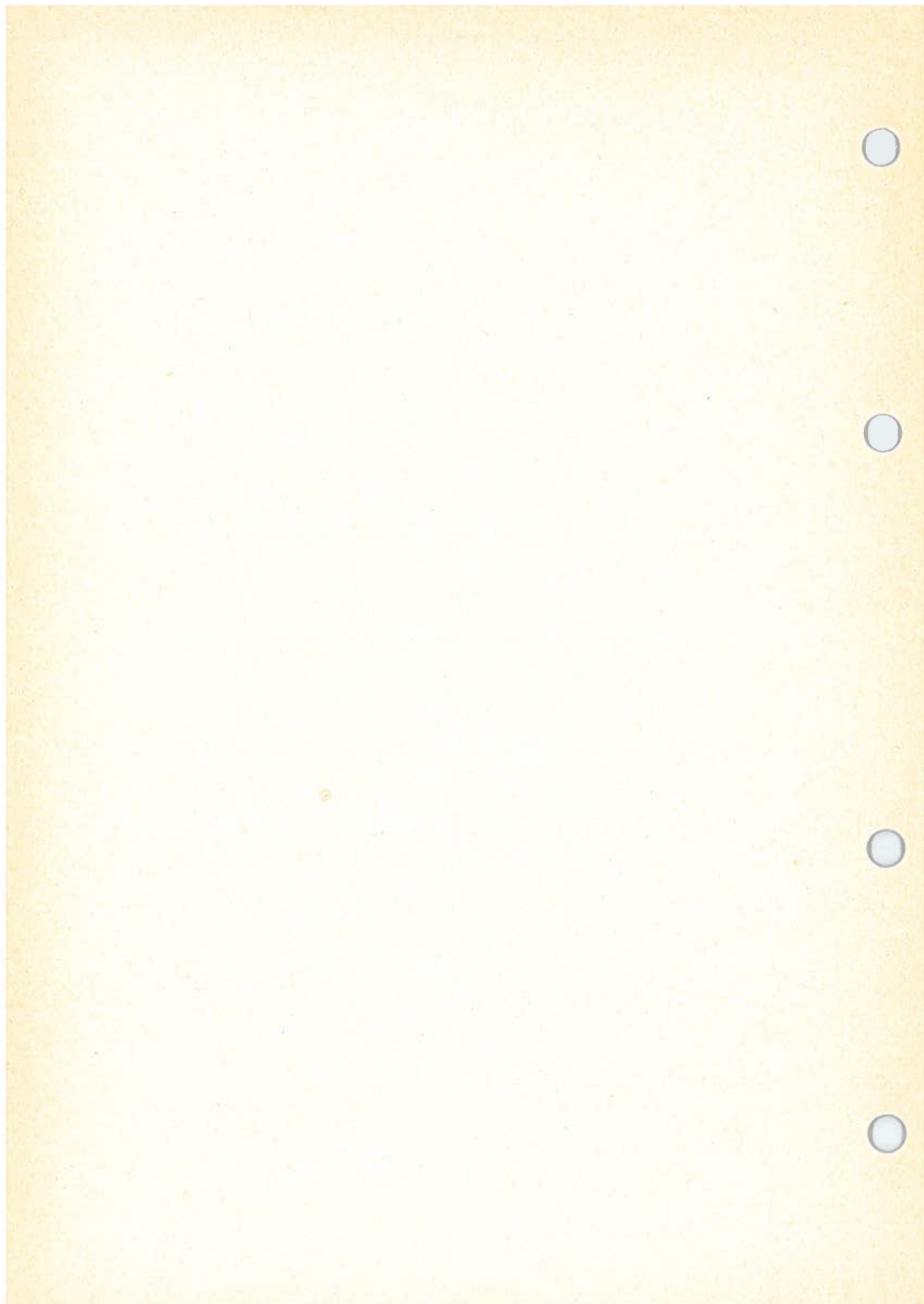
Protective measures already taken: Nil.

Measures proposed: "Ecological study by competent field workers suggested with a view to report on present status as regards numbers and suggestions as to amount and kind of protection required." (3)

Number in captivity: "Nil to my knowledge. Jersey Zoo held one a few years ago; this seems to have been the first since the 1939-45 World War." (3)

Breeding potential in captivity: "Presumably as for Pithecia which has successfully bred in San Diego Zoo." (3)

- References:
1. Hill, Vol. IV., 1960
 2. Walker, 1964
 3. Osman Hill in litt. 16/7/65



WOOLLY SPIDER MONKEY

Brachyteles arachnoides (E. Geoffroy, 1806)

Order PRIMATES

Family CEBIDAE

Distinguishing characteristics: Limbs long and slender; tail longer than body, naked near tip, and prehensile. "The pelage is woolly, and the hairs of the head are short and directed backward. There may be a sexual difference in coloration, but this may be only individual and geographical variation. Most woolly spider monkeys have a prevailing color of yellowish gray or ashy brown, although some are reddish. The head is blackish brown tinged with yellow, or dark gray washed with brown, or the forehead and back of the neck may be orange-rufous and the top of the head chestnut. The flat and naked face is often brilliant red in color, particularly when the animal is excited." (2:436)

Present distribution: "Confined to the Tupi forests of the coastal area and coastal montane tract of south-eastern Brazil; from the southern part of the state of Bahia in the north to Sao Paulo in the south; extending inland into Minas Geraes." (1:353)

Former distribution: "Was more widespread in Pleistocene times, but present restricted distribution is of apparently long standing." (4) "Vieira considers that in former times, before the denudation of the coastal forest belt, the range extended northwards to Cabo São Roque in the State of Rio Grande do Norte." (1:357)

Status: "The Woolly Spider-monkey, of which but a single species is, at present, recognized, is the rarest and least known South American Primate. It is probably on the way to extinction from phylogenetic senescence and its present rarity is due to its very restricted geographical distribution." (1:253)

Estimated numbers: Unknown. (4)

Breeding rate in wild: "No data available." (4)

Reasons for decline: "Reduction of habitat forests by encroachment of agriculture and human occupation renders protection essential for survival." (4)

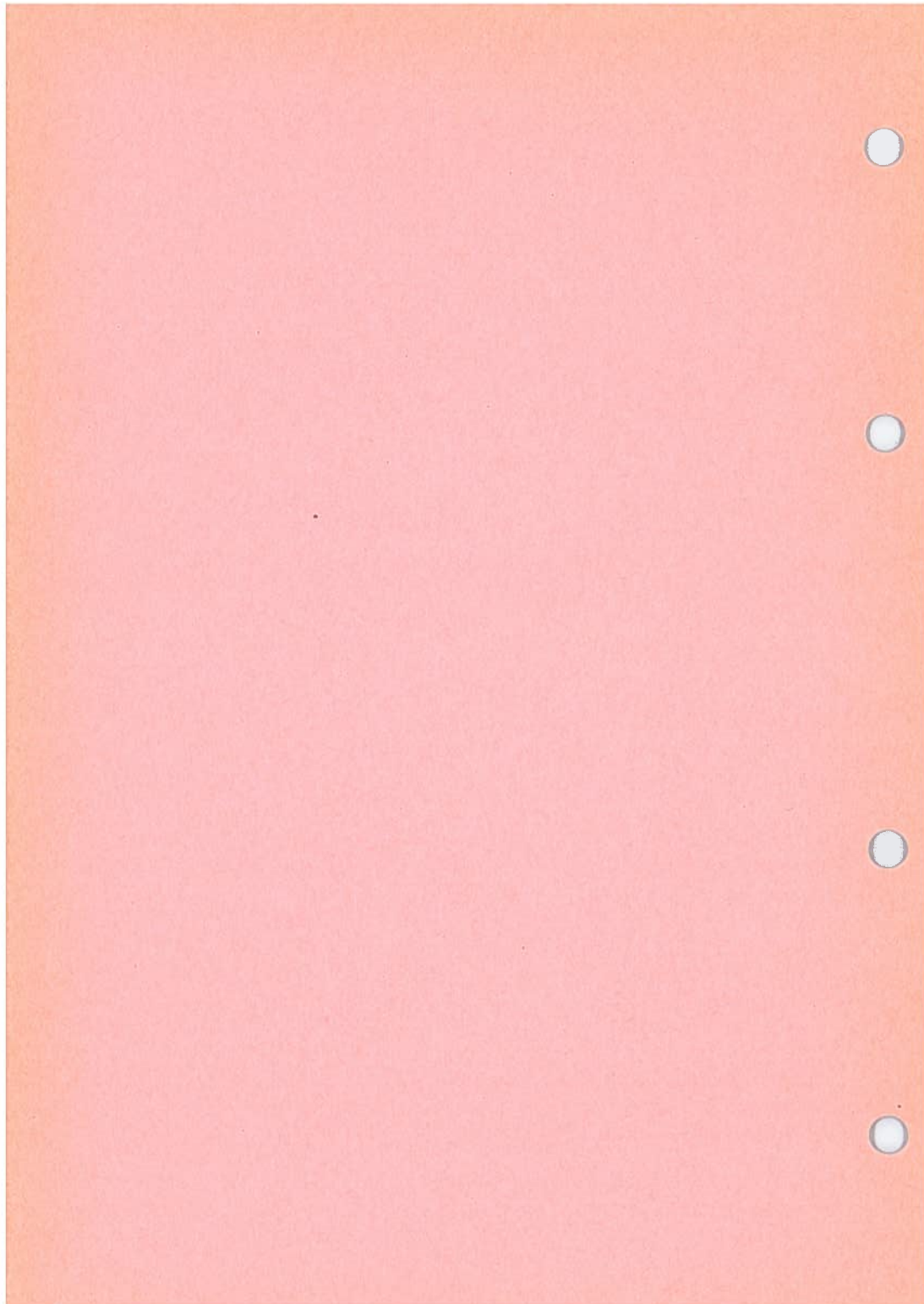
Protective measures already taken: "None to my knowledge." (4)

Measures proposed: "Ecological study by competent field workers suggested with a view to report on present status as regards numbers and suggestions as to amount and kind of protection required." (4)

Number in captivity: None at present. (4) There are very few records of this species in captivity. Crandall records a specimen at the Leipzig Zoo in the 1930's, and an immature female which lived in the Bronx Zoo from 24.4.59 to 27.5.60. The latter died from a heavy infestation of internal parasites. (3:99)

Breeding potential in captivity: "Unknown. Has never been bred, but potentially probably similar to Ateles." (4)

- References:
1. Hill, Vol. V., 1962
 2. Walker, 1964
 3. Crandall, 1964
 4. Osman Hill in litt. 16/7/65



GOELDI'S TAMARIN

Callimico goeldii (Thomas, 1904)

Order PRIMATES

Family CALLITHRICIDAE

Distinguishing characteristics: Length of head and body 180 to 215 mm.; tail 250 - 325 mm. "Adults are brownish black, with buffy markings on the back of the neck and two or three light buff-colored rings on the basal part of the tail. Young animals lack the buffy tail rings and sometimes the buff on the back. The head, or even the entire dorsal surface, may be spotted with white. The hair is thick and soft. There are no ear tufts. A mane drapes from the neck and shoulders, and the elongated hairs of the rump extend skirt-like over the base of the tail. The facial appearance, foot structure, and claw-like nails are marmoset-like, but the skull configuration and dental formula are like those of Cebid monkeys." (2:438)

Present distribution: "Western Brazil; Acre territory, Rio Xapury and possibly adjacent parts of Peru." (3)

Former distribution: "Species has only been known for 50 years and present range still remains to be defined." (3) "All the specimens known up till 1914 were from Para, but had apparently been brought there by river transport from the Upper Amazon basin." (1:321)

Status: "A rare species unique in its genus; a link between the two existing families of platyrrhini." (3)

Estimated numbers: "Unknown. Possibly plentiful in the limited area of its occurrence, but has only within the last few years appeared in the live animal market." (3)

Breeding rate in wild: "No data available." (3)

Reasons for decline: "Increased export into the pet market." (3)

Protective measures already taken: "Nil to my knowledge." (3)

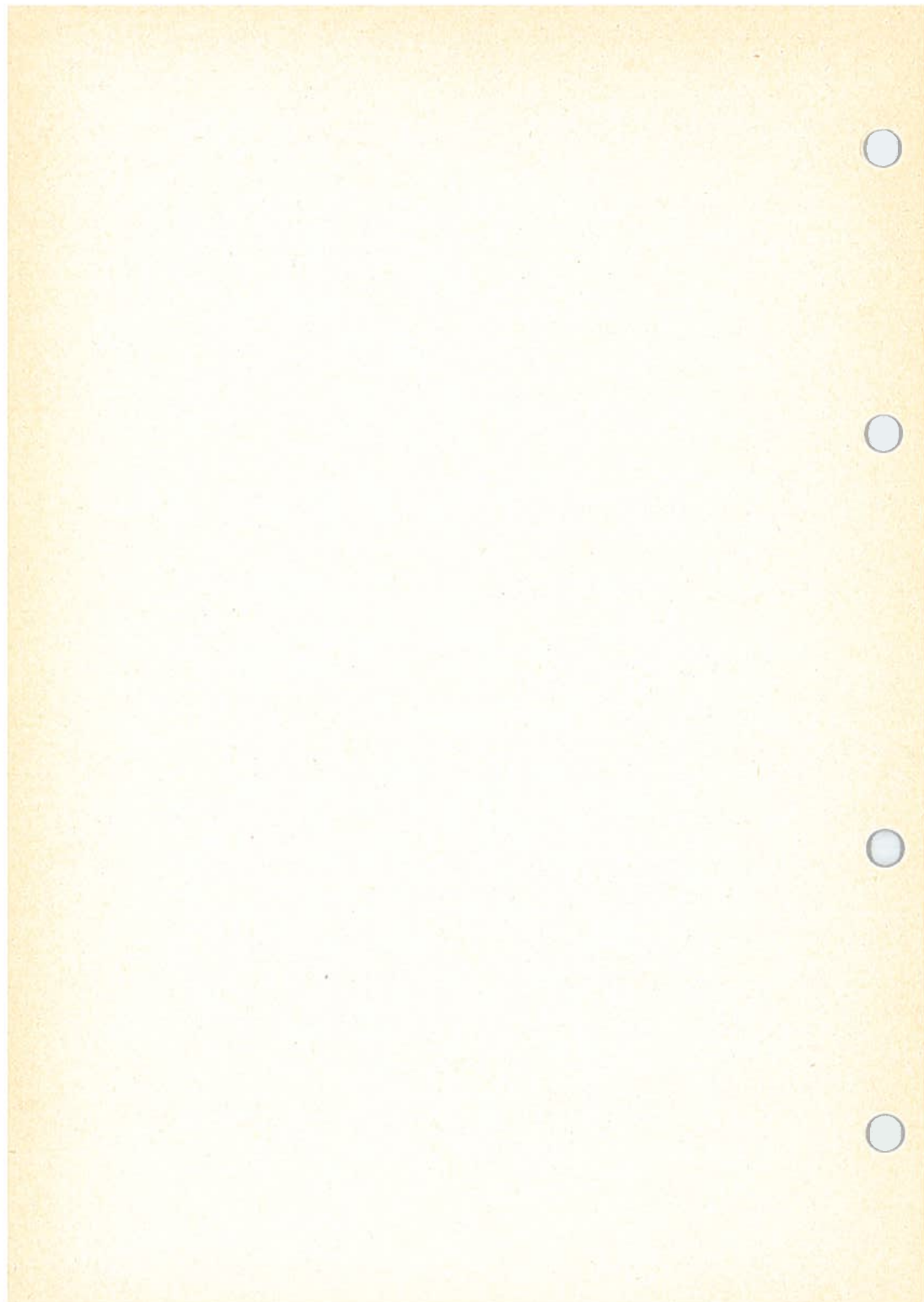
Measures proposed: "Ecological study by competent field workers preparatory to report on present status and possible future protective measures. Limitation or prohibition of export." (3)

Number in captivity: "Not more than a dozen. High mortality rate in newly exported animals. Has been successfully bred to my knowledge only by Dr. L. Rane of Miami University." (3)

Breeding potential in captivity: "Good, provided correct husbandry is employed." (3)

References:

1. Hill, Vol. III., 1957
2. Walker, 1964
3. Osman Hill in litt. 16/7/65



TANA RIVER MANGABEY

Cercocebus galeritus galeritus Peters, 1879

Order PRIMATES

Family CERCOPITHECIDAE

Distinguishing characteristics: "The top part of the head has a flat whorl of longer hairs radiating from a fringe on the forehead ... The upper parts are covered with long, soft hair which is grey at the roots and mainly grey-green and black-brown at the tips, so that it appears crimped. The black-brown colouring is most prominent in the hair of the 'coif', the greater part of the tail, the forearms, the hands and feet. The sides of the head as well as the entire underside of the animal appear more yellowish, the innerside of the limbs being yellowish-grey. The tip of the tail appears lighter in colour than the remainder of the tail, the hair of which also shows yellowish rings." (1:830-831)

Present distribution: "Exists in the Lower Tana region at approximately where the Tiva River (the Galla name for which is Lak Kokani) joins the Tana River on the south bank. They may exist on the north bank but I have no knowledge of this, nor have I investigated this area ... in my opinion they do not exist up-stream of Mnazini on the Tana River." (3)

Former distribution: The gallery forests of the lower Tana River. "The only specimen, a full grown male, was killed on the 16 November at the mouth of the Osi and Tana rivers, in Mitole. This species is often encountered in the riverine forests in groups of 4 to 6. Due to its high pitched screech, which sounds something like 'Krau' the Wapokomo call them 'Garau'." (1:831)

Status: "The 1963 Los Angeles County Museum zoological expedition to the Tana worked from Bura 50 - 60 miles downstream and although they kept a lookout for the mangabey they saw none ... The Kenya Game Department Warden in the area has kept a lookout for two years but has seen none." (2) "I have only once seen the mangabey (about 8 together, in June, 1961) ... They appear to live a very localized existence." (3)

Estimated numbers: "I have no idea how many are alive today but would guess their numbers to be very limited." (3)

Breeding rate in wild: Unknown.

Reasons for decline: The heavy cultivation in this area has compelled the mangabey to abandon the riverine forest. They now live in stretches of forest along the flood water channels up to four miles distant from the main river. "This is a most inaccessible piece of country and I know of no other person who has investigated this region ... The forest along the flood water channels is not yet being cleared for shambas, but is subject to intensive trapping by the local people, as is all the Lower Tana region, although generally the local people do not concern themselves with slaughtering monkeys except when they invade shambas." (3)

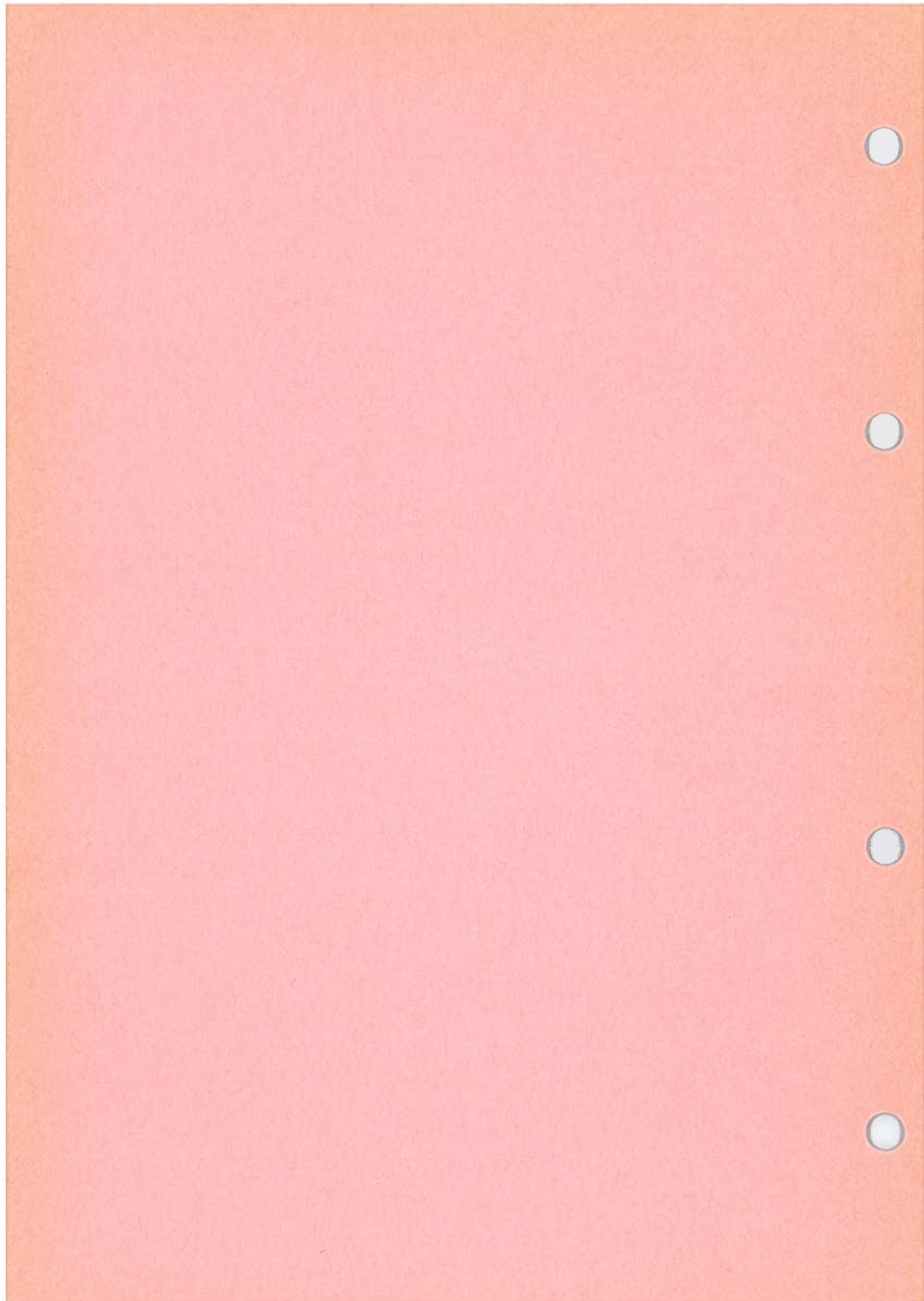
Protective measures already taken: Fully protected by the Kenya Game Department. No capture permits are given. (2)

Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: Probably good since other species of this genus breed readily in captivity. (4)

- References:
1. Peters, 1879
 2. D.R.M. Stewart, in litt. 26/3/64
 3. R. Destro, in litt. 12/4/64 & 25/4/64
 4. C. Booth, in litt. 4/5/64



SNUB-NOSED MONKEY

Rhinopithecus roxellanae (Milne-Edwards, 1870)

Order PRIMATES

Family CERCOPITHECIDAE

Distinguishing characteristics: "Coloring bright and handsome in the male. The top of the head, nape, shoulders, upper parts of the arms, back and tail, grayish black, the back more or less overlain with long silvery hairs; tail tip whitish; forehead, sides of the head to and including the ears, and sides of neck, and under surface of body and limbs, ochraceous rufous, this color extending to the hands and feet, and the outer and inner borders of the hind leg. The female is similar, but the head and upper parts, and the outer side of the limbs are brownish black, the rufous tints less deep, and a patch on the upper part of the thigh and the anal region whitish. (Elliot, 1913)." (2:300)

Present distribution: "Approximate distribution of species as here understood: China, States of Szechuan (into Southern Kansu), Yunnan and Kweichow." (3:202) A report of this monkey has come from Assam. "We have consulted Dr. Osman Hill ... who tells us that Colonel Wood's description certainly agrees with R. roxellanae, except for size, a very uncertain factor. This monkey has never yet been known to occur outside E. Tibet and N.W. China to Koko-Nor." (Oryx, Vol. I, p. 215)

Former distribution: "The Golden Monkey ranges through the high mountain forests of western Szechwan (district of Yaochi) to the borders of Tibet and north into southern Kansu. Thus, as Milne-Edwards wrote, it is undoubtedly one of the most resistant of all monkeys to cold, living as it does in areas where snow covers the ground during more than half the year." (2:301)

Status: Sowerby (1937) lists R. roxellanae among the species calling for special protection "if they are to be saved from ultimate extinction." (1:256) Bourlière describes this monkey as "among the rarest known." (4:37)

Estimated numbers: Unknown.

Breeding rate in wild: Gestation period ca. 5 months: young born April. (9)

Reasons for decline: Since its discovery by Père David this monkey has always been regarded as rare and little appears to have been recorded about the three races which constitute the species. Walker states that "formerly the pelage was believed to ward off rheumatism and could be worn only by Manchu officials," (6:465) but it is not known whether this was a factor contributing to the decline of the species.

Protective measures already taken: According to Mr. Al Oeming, this species is now accorded special protection in China. (?)

Measures proposed:

Number in captivity: Peking 3 ♂♂, 2 ♀♀; Shanghai 3 ♂♂, 7 ♀♀. (8) Those at the Peking Zoo were the first to have been exhibited at any zoo in the world. (5:169)

Breeding potential in captivity: The Shanghai Zoo has succeeded in breeding three specimens and the Peking Zoo one (♂). (8)

Remarks: "It is very difficult to capture, because it lives in the great pine forests on high mountains and very seldom, if ever, leaves its stronghold for places lower and nearer to human settlements. It is only possible to catch young ones alive, and then very difficult to keep them healthy." (5:169)

- References:
1. Sowerby, 1937
 2. Allen, 1938-40
 3. Ellerman & Morrison-Scott, 1951
 4. Bourlière, 1964
 5. T'an Pang-Chieh, 1964
 6. Walker, 1964
 7. Al Oeming in litt. 4/11/64
 8. C. Jarvis in litt. 7/1/66

ZANZIBAR RED COLOBUS

Colobus badius kirkii Gray, 1868

Order PRIMATES

Family CERCOPITHECIDAE

Distinguishing characteristics: "Forehead and sides of head yellowish white, the long hairs extending beyond the sides of the head; crown, lower part of neck, back from shoulders, reddish brown; shoulders, outer side of arms, hands and feet black; throat and under parts grayish white; tail dull reddish brown." (1:163)

Present distribution: Occurs in small troops of 6 or 7 individuals, fairly widely distributed over an area consisting of between a third and a half of the east coast bush of Zanzibar, much of it coral rag scrub which is largely unsuitable for human occupation. It also occurs in the Jozani Forest. (6) "They live in Calophyllum inophyllum forest which is protected and which, at least at certain times, is not easy of access. When I was there [April 1964] entering the forest meant wading knee-deep in some places." (7)

Former distribution: "Whether Kirk's colobus formerly inhabited the now much reduced primary forest or whether it has lived chiefly in the scrub is not certain, as naturalists seem, ever since its discovery in 1868 by Sir John Kirk, the British Consul in Zanzibar, to have concentrated entirely on the former." (3:128)

Status: "It used to be thought that its main habitat was the island's dwindling primary forest - a belief that has led to assumptions by some writers that the monkey is extinct, or nearly so, owing to human encroachment. In fact, however, those now in existence inhabit a stretch of thick bush along Zanzibar's eastern seaboard, uninhabited apart from a few fishing villages and uncultivated owing to the outcrops of coral and the shallow soil ... there is not much likelihood of it suffering from human interference where it is now." (3:128)

Estimated numbers: According to Miss Faulkner there are approximately 200. (6)

Breeding rate in wild:

Reasons for decline: Unlike West Africa where the red colobus monkeys are restricted to the high forest habitat, Zanzibar has no high forest and C.b. kirkii occurs in 'low, thin vegetation'. So far as is known this subspecies has never been plentiful. (2) Destruction of the habitat is believed to be the principal reason for decline: capture of the colobus by the local people for sale to tourists may have been a contributory factor. "Those sold to tourists probably die quickly." (5)

Protective measures already taken: Jozani Forest was declared a Forest Reserve in 1960 and is not being worked to any great extent. The red colobus is protected under the Wild Animals Protection Decree and the authority of

the Minister of Agriculture is required by anyone wishing to capture, kill or export it in any form. (6) Resolution No. 33 of the 1963 IUCN General Assembly called upon the Government of Zanzibar to take all possible steps to safeguard the habitat and whatever other precautions may be necessary to ensure the survival of the red colobus.

Measures proposed: According to Miss Faulkner, part of the Jozani Forest has been planted with exotic trees. (6) 'It should be emphasised that the replacement of indigenous forest by exotic plantations would be disastrous for the colobus'. (2)

Number in captivity: Antwerp, 1 ♂ 2 ♀♀ : Frankfurt, 2 ♀♀ + 1. (4:376) "... it lives on leaves, twigs and buds - a specialised diet which makes it very difficult to keep in captivity ..." (3:128) "In 1963, 12 were imported into Kenya and offered to zoos at £ 600 each. Ten of them soon died, partly because they were not provided with suitable diet and partly because they were taken to the unaccustomed cold of the Kenya Highlands." (6)

Breeding potential in captivity: "... Neither red nor olive colobus have so far been kept alive in captivity for any length of time, let alone bred in captivity ... the chances of success in maintaining them in captivity are sufficiently high to justify an attempt ... to save in this way the Zanzibar form, whose position in Jozani is so precarious." (2) An investigation into their feeding habits and experiments with artificial feeding should be undertaken before any attempt is made to establish a captive breeding nucleus. (5)

Remarks: "The chief interest of this monkey, apart from its island habitat to which no member of the black-and-white group extends, is that in the skull the median frontal suture remains open into adult life, a rare condition sometimes found also in man." (1: 163)

- References:
1. Harper, 1945
 2. Booth, 1963
 3. Webb, 1964
 4. Jarvis, 1965
 5. Chief Game Warden, Tanganyika in litt. 7/1/64
 6. I.R. Grimwood in litt. 26/2/64
 7. Th. Monod in litt. 29/6/64

TANA RIVER RED COLOBUS

Colobus badius rufomitatus Peters, 1879

Order PRIMATES

Family CERCOPITHECIDAE

Distinguishing characteristics: "... a grown male has the hair of its head inclining to the rear, with the exception of the hairs on the forehead which are vertical and a vertical "comb" between the ears. The shoulder hairs are slightly but not very much longer than those on the back. The back of the neck, the back, the exterior side of the fore limbs up to the lighter underside of the forearm, the middle of the thigh, the terminal third of the tail, the hands and feet, are dark olive-brown. The top part of the head is rust-red, with the exception of the eyebrows and the "comb" of hair between the ears which are black-brown. The front part of the neck and the inside of the legs are grey or tending towards an olive colour; chest and stomach are grey-yellow, the grey hairs being to a large extent olive-yellow at the tips." (1:829-830)

Present distribution: "Confined to the gallery forests of the Lower Tana River." (2:171)

Former distribution: "This species was only encountered about 3½ days' journey up-river near the locality of Muñiuni. ... The species resides in very high treetops of the riverine forest and, according to the natives, never comes down to the ground." (1:830)

Status: "It seems that the subspecies is not uncommon locally, but it is undoubtedly threatened by potential destruction of its habitat." (3)

Estimated numbers: Unknown. "I have often seen them but their numbers are very limited." (4) "20-30 were seen by the 1963 Los Angeles County Museum zoological expedition to the Tana c. 40 miles downstream from Bura on the southern [western] bank." (3)

Breeding rate in wild:

Reasons for decline: Destruction of the riverine forest and extensive cultivation along the banks of the Tana have forced the local fauna to move away from the river into patches of inaccessible forest along the flood water channels. (4)

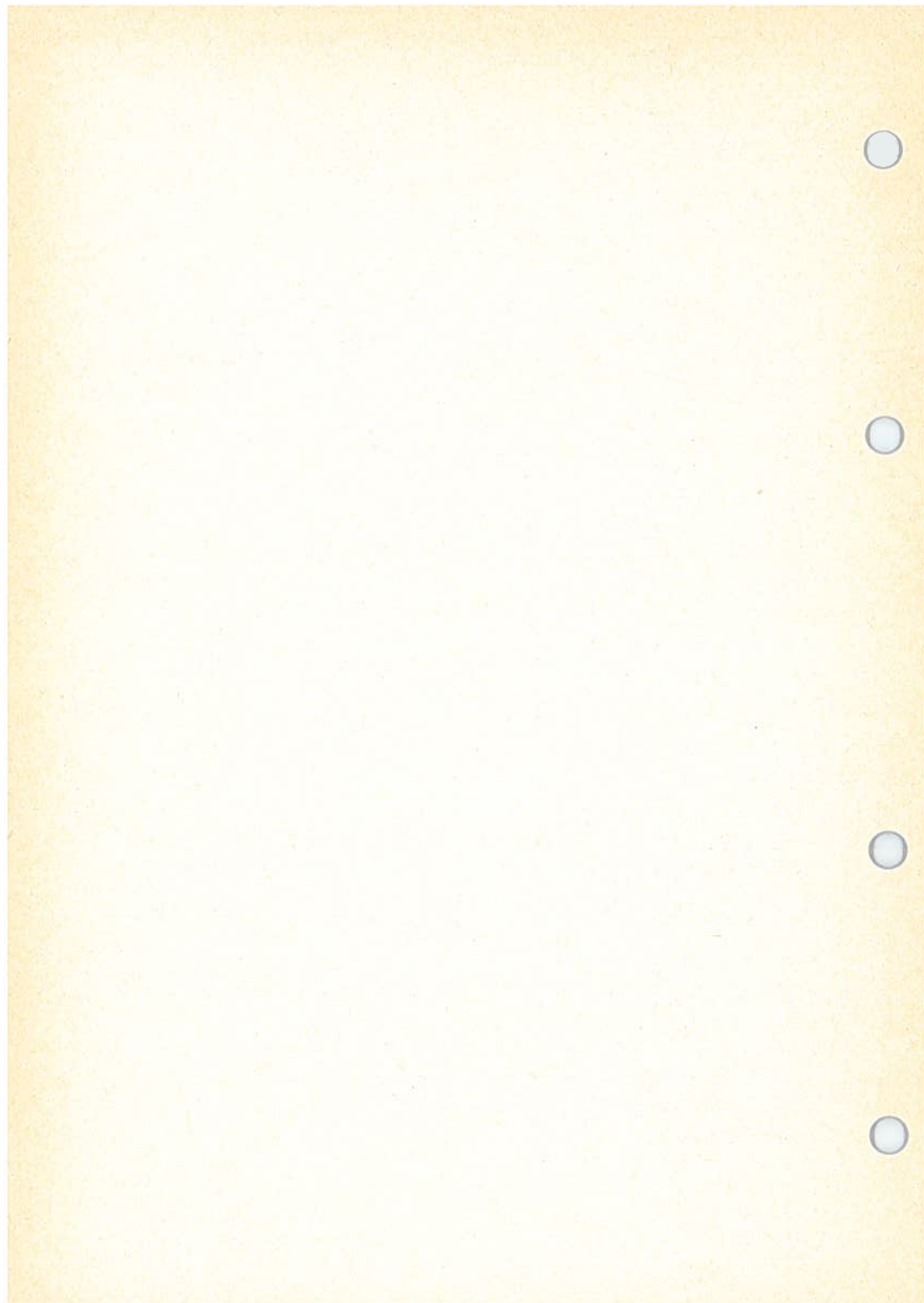
Protective measures already taken: Fully protected by the Kenya Game Department. No capture permits are given for this animal. (3)

Measures proposed:

Number in captivity: None.

Breeding potential in captivity: "All red colobus monkeys are extremely difficult to maintain in captivity." (5)

- References:
1. Peters, 1879
 2. Allen, 1939
 3. D.R.M. Stewart, in litt. 26/3/64
 4. R. Destro, in litt. 12/4/64 & 25/4/64
 5. C. Booth, in litt. 4/5/64



UHEHE RED COLOBUS

Colobus badius gordonorum (Matschie, 1900)

Order PRIMATES

Family CERCOPITHECIDAE

Distinguishing characteristics: Allen describes this "strikingly coloured subspecies" as follows: "The top of the head is deep ferruginous, the back shining black; forelimbs black, hind limbs mixed black and silvery, the tail mixed black and ochraceous; lower surfaces white." (2:163)

Present distribution: Swynnerton and Hayman record it only from Dabaga in the Uzungwa Mountains of Iringa District (3:302), 8°7'S; 35°55'E. Red colobus are quite well distributed along the lower slopes of the Uzungwa scarp Forest Reserve and seem especially abundant in the Magombera Forest Reserve. They also occur in the forest east of Kilombero Sugar and south of the Ruaha River as far downstream as the junction of the Dekero River. They are reported to occur along the forest on the Iringa Escarpment as far east as Chita and Mguwe (near the Kihanzi Falls). (4)

Former distribution: "Known only from a circumscribed area in the Uzungwe Mountains to the northeast of Lake Tanganyika." (2:163)

Status: Almost nothing has been recorded about this colobus. Matschie (1900) states that "the two von Gordon brothers were fortunate to obtain two specimens of this monkey in the Utshungwe Mountains in Uhehe, German East Africa, south of Iringa, east of the little Ruaha, between the latter and the Ulanga. Unfortunately the skulls disappeared from the transport and also the pelts suffered severely." (1:186) G. M. Allen states that "in 1923 Kershaw recorded another specimen secured in the same region by Arthur Loveridge, who on a second visit obtained four others for the Museum of Comparative Zoology. ... On the somewhat isolated Uzungwe Mountain range Mr. Loveridge found this monkey but once, when at an altitude of some 5,000 feet he came upon a troop just at dusk. They live in high forest and are with difficulty obtained." (2:163) "Where they occur they are not difficult to obtain and they live in suitable forest conditions at altitudes of little more than 1,000 ft." (4)

Estimated numbers: Unknown.

Breeding rate in wild:

Reasons for decline: "Their chief danger is perhaps from native hunters, but also possibly in future encroachments upon the small area of forest to which they are confined." (2:163) In recent years the available habitat has been substantially reduced through clearance of the indigenous forest (out-side forest reserves) for settlement, including the establishment of tea estates.

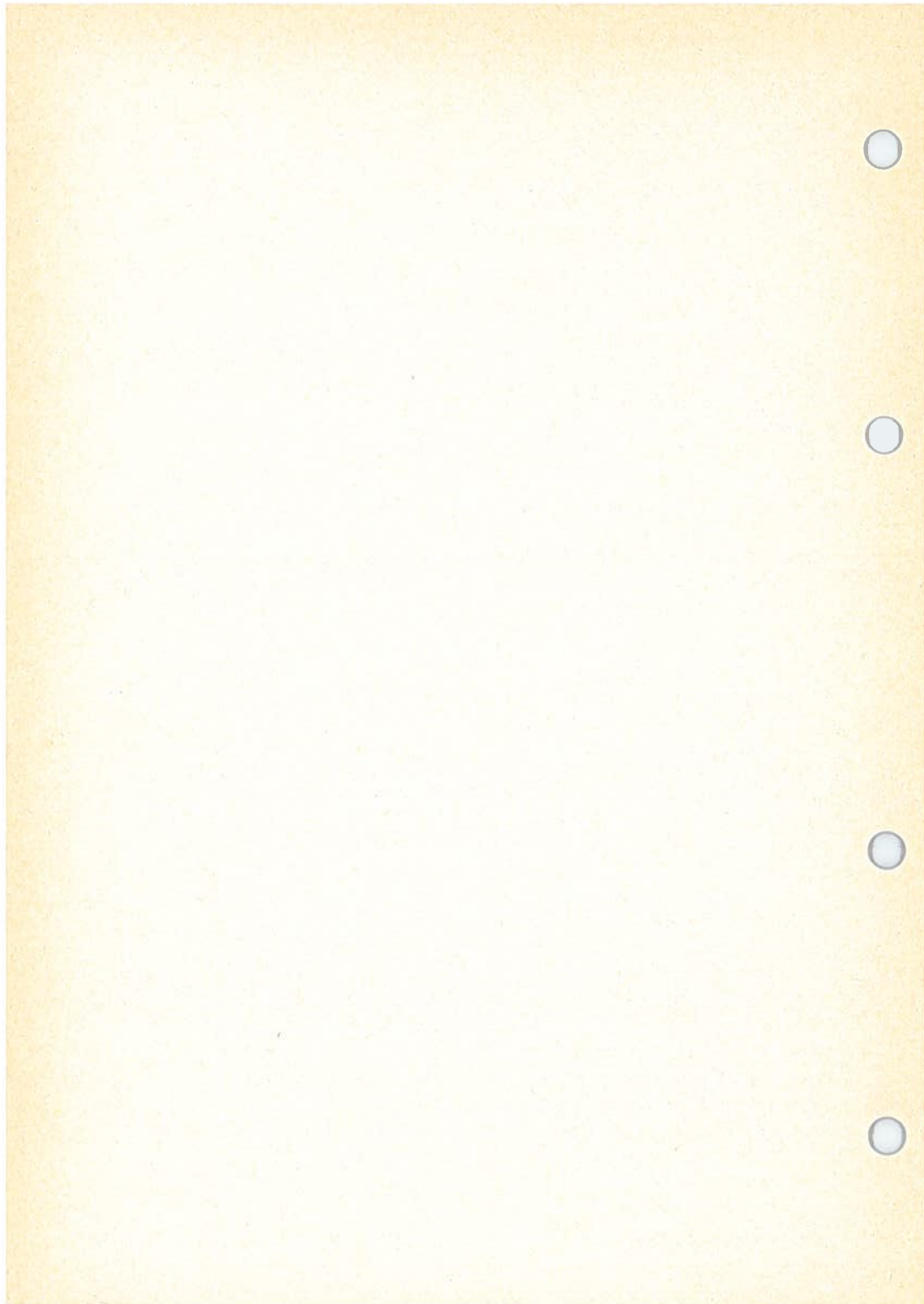
Protective measures already taken: "The species is accorded the status of 'Royal Game' and is therefore completely protected. In addition no person may possess a skin or part of a skin without a Certificate of Lawful Ownership - which we would be unlikely to grant except in very special circumstances and I have never yet come across such a case." (4)

Measures proposed: Habitat destruction is a much greater threat to the colobus than illegal hunting, and strict protection of the forests which constitute the Uzungwa scarp Forest Reserve and the Magombera Forest Reserve would appear to be essential to the survival of these animals. (4)

Number in captivity: None.

Breeding potential in captivity: Unknown.

References: 1. Matschie, 1900 3. Swynnerton & Hayman, 1951
2. Harper, 1945 4. Tanzania Game Dept. in litt.
24/2/65 and 15/9/65



ORANG UTAN

Pongo pygmaeus (Hoppius, 1763)

Order PRIMATES

Family PONGIDAE

Distinguishing characteristics: "The adult Orang-utan is a large shaggy animal, of dark rufous color. The profile of the skull is much more sloping than in the African anthropoids, the skull showing very little of the brow ridges so prominent in the latter. The arms are very long, reaching to the ankles when the animal is erect; foot long and narrow, the great toe very short. Tail absent. Prominent cheek callosities sometimes present in adult males ... " (2:164-165)

Present distribution: Sumatra: Carpenter stated that in 1937 orangs were found "throughout an estimated fifty percent of the primary forests in the former State of Atjeh," northern Sumatra. (1:19) Milton concludes that the present day population is mainly confined to the Löser Reserve. "In addition, however, there is an area to the north which I was unable to visit, another area on the coast on the west slopes of the Löser, and a third area directly west of Medan, all of which are known to contain orang-utan." (6:182)

Sarawak: distribution is limited to about 2,000 sq. miles. (3:82)

Sabah: the Orang occurs in "extensive sections of Borneo." (3:82)

Kalimantan: confined to limited areas in the north-east and west. (5:247)

Former distribution: At one time the Orang-utan occurred on the Asiatic mainland. "Remains have been found in Stone Age archaeological sites from Peking to the Celebes." (5:11) "... remains of anthropoids resembling the Orang are known from the Siwilak Hills of India, but there seems to be no evidence of their survival to the historic period." (2:164) "Even within these two islands [Sumatra and Borneo] they were much commoner and more widespread in the recent past." (5:11) "There are none left in the State of Brunei, between North Borneo and Sarawak." (5:199)

Status: "Although no population estimates are available prior to 1959, it is apparent from the earlier literature that orang-utans have declined drastically in the past hundred years." (3:75)

<u>Estimated numbers:</u>	Sabah	approx.	2000	
	Sarawak	"	700	
	Kalimantan	"	1000	
	Sumatra	"	1000	
	Total	"	5000	(8)

Breeding rate in wild: Gestation period 210 - 270 days. Has a single infant probably every fourth year. Female remains fertile for as long as 23 - 25 years. Thus, allowing for an infant mortality rate of 40%, the average lifetime reproductive rate may be 2 - 3 young per female. (8)

Reasons for decline: Sumatra: "As large clearings are made in the rather level lowlands, these apes are being destroyed or forced into the hills and mountains where it is questionable whether or not conditions, including food supply, are sufficiently suitable for the maintenance of the present population level ... the most serious inroads being made by commercial developments in the areas suitable for orang-utan habitats." (1:19) "The situation in Sumatra ... is accentuated by the presence there of soldiers with rifles, and by the proximity of the Asian mainland and the difficulty

of controlling smugglers in sailing sampans." (5:199) "The biggest menace to orang conservation is the Indonesian Army ... They hunt orangs in Sumatra with automatic weapons and sell the babies to smugglers." (9)

Sarawak: "Hunting has been the major cause of their decline in the past and habitat destruction threatens them at present in their major area of concentration." (3:82)

Sabah: The large illicit trade in young orangs and the high mortality rate during the process of capture which usually involves killing the mothers, have resulted in a substantial numerical decline. An important contributory factor is the extensive commercial exploitation of the natural habitat for forestry purposes. (4:241-242)

Kalimantan: "Such meagre evidence as is now available from the large area of Indonesian Borneo territory indicates a continuing, almost uncontrolled exploitation of Orangs there - whatever intentions and regulations are in force on paper." (5:199)

Protective measures already taken: The International Union of Directors of Zoological Gardens has agreed to introduce stringent regulations prohibiting the purchase of orangs through illicit channels.

Measures proposed: Schaller makes the important point that "it is doubtful if the orang-utan will ever adapt to habitat other than primary forest and old secondary forest. ... The only hope for the remaining orang-utans ... lies in the preservation of the forest reserves which still harbor animals. These reserves are at present being logged in the accessible portions ... logging has damaged some sectors so heavily that expansion of this activity can only be detrimental to the remaining animals. All hunting, too, must cease if the orang-utan is expected to survive." (3:77) Regulations governing the importation of orangs into Singapore and other eastern ports require strengthening and active enforcement. (8) "Close cooperation among the countries of South-East Asia is necessary to control the illegal trade. There is also an urgent need to establish fully protected sanctuaries in the Mount L  ser Reserve (Acheen), in Sarawak, and in the Sampit Reserve (Borneo)." (10) The IUCN Conference on Conservation of Nature and Natural Resources in Tropical South-East Asia, Bangkok, (4/12/65) passed a resolution recommending the establishment of a 700 sq. mile sanctuary at Ulu Segama, eastern Sabah. The Conference also recommended that the Governments concerned should appoint research officers to undertake long-term studies of the breeding biology and behaviour of the species. (11)

Number in captivity: The total number of orangs in zoos throughout the world is estimated at 133♂ and 141♀ + 4 in 96 zoos. (7:377) A breeding colony has been established at the Yerkes Laboratory with the object of attempting to perpetuate the species and to carry out psychological studies. (9)

Breeding potential in captivity: Of the above, 10♂♂ and 16♀♀ + 11 were born in captivity. (7:377) The rearing of captive orangs is difficult. (4:259)

- References:
1. Carpenter, 1938
 2. Harper, 1945
 3. Schaller, 1961
 4. Harrisson, 1961
 5. Harrisson, 1962
 6. Milton, 1964
 7. Jarvis, 1965
 8. B. Harrisson in verbis 29/11/63
 9. G. Bourne in litt. 26/2/64
 10. H. Basjarudin in litt. 28/10/65
 11. IUCN Bulletin No. 18, Jan/Mar 1966

PYGMY CHIMPANZEE

Pan paniscus Schwarz, 1929

Order PRIMATES

Family PONGIDAE

Distinguishing characteristics: "The Bonobo is less than half the size of the chimpanzee. Its skull is much more spherical, the body more slender, the ears smaller, and the lips are reddish in color. The second and third toes of the Bonobo are partially joined." (4:6)

Present distribution: "... seems to be confined to two areas, both on the south or left bank of the Congo River. The smaller area to the south may prove to be continuous with the northern part of the range ..." (2:34) "The southern limit of this range is probably the edge of the rain forest, but, except for one report, all the existing evidence groups them considerably north of this line." (2:54) "Confined to humid forest on the left bank of the Congo River. Southern limit for the most part Kasai and Sankuru rivers." (3:206)

Former distribution: This species was first described in 1929. (1:425-426) Its distribution prior to that time is not known.

Status: "The range of the Bonobo is very small." (4:6) Rare in the southern part of its distribution - this due to the fact that the forest in this region is interspersed with large stretches of savanna. Lives in groups of up to 30 individuals. Less aggressive than the ordinary chimpanzee and more intelligent. (3:206-207)

Estimated numbers: Unknown.

Breeding rate in wild: "Practically nothing is known of its habits in the wild state." (4:6)

Reasons for decline: Inapplicable? The greatest danger lies in destruction of the high forest habitat.

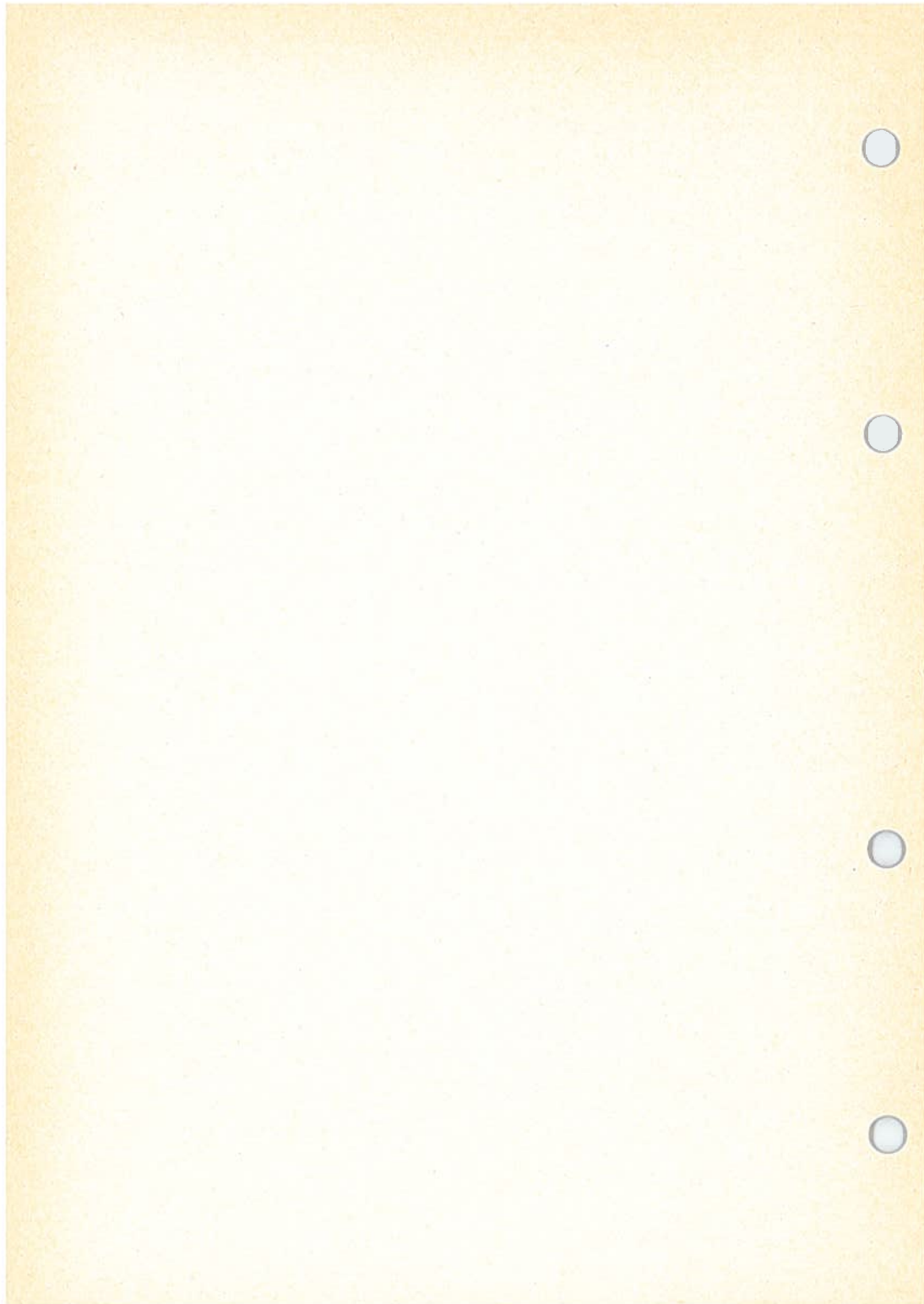
Protective measures already taken: Included in Schedule B of the 1933 London Convention.

Measures proposed:

Number in captivity: 8 ♂♂ and 9 ♀♀ in 5 zoos. (5:377) Rotterdam also has at least one. (6)

Breeding potential in captivity: Successful breeding occurred at the Frankfurt Zoo on 22/1/62 and 22/12/63. (6)

- References:
1. Schwarz, 1929
 2. Coolidge, 1933
 3. Vanderbroek, 1959
 4. Pournelle, 1960
 5. Jarvis, 1965
 6. R. Faust in litt. 6/1/64



MOUNTAIN GORILLA

Gorilla gorilla beringei Matschie, 1903

Order PRIMATES

Family PONGIDAE

Distinguishing characteristics: "The external characters that distinguish the Mountain from the Coast Gorilla are, besides a longer palate and a generally narrower skull, the thicker pelage, shorter arms and longer legs, large amount of black hair, and fleshy callosity on the crest." (1:375)
"Males ten years and older have a prominent gray or silver saddle." (2:68)

Present distribution: "The range of the mountain gorilla extends from the equator south to about 4°20' S latitude, a distance of a little over 300 miles, and from longitude 26°30'E to the western escarpment of the rift valley at about 29°30' longitude. A small extension penetrates the Virunga Volcanoes and the Kayonza Forest on the floor of the rift valley and eastern rift mountains respectively, to 29°45'E. The range is in the form of a triangle with its points near Lububu on the northwest, Lubero on the northeast and Fizi on the south, and it covers an area of about 35,000 sq. miles. Within the borders of this range, most of the gorillas are concentrated in about sixty more or less isolated tracts of 10 to 200 sq. miles each. ... The area actually occupied by gorillas is at least 7,500 to 8,000 sq. miles, or only about 21 to 23 per cent of the total area encompassed by their range." (2:29)

Former distribution: "Minor differences between the lowland and mountain forms suggest that the divergence between the two occurred in the not too distant past. The present distribution of the two subspecies further suggests that at one time the population was continuous throughout a rain forest belt from west to central Africa north of the Congo River." (2:27-29)

Status: "Although the extinction of the mountain gorilla is not imminent, constant vigilance should be maintained by conservationists to insure its survival." (2:335)

Estimated numbers: "The whole mountain gorilla population comprises probably no less than 500 and no more than 15,000." (2:329)

Breeding rate in wild: Females do not reach sexual maturity until 6 - 7 years of age and males at about 9 - 10 years. Gestation period of 4 zoo infants varied from about 251 - 289 days. A female produces a single young every 3½ to 4½ years, unless the young dies in infancy. "About 40 - 50 per cent of the gorillas appear to die during the infant and juvenile stages." (2:329)

Reasons for decline: Disease is probably the main cause of mortality. (2:98) The greatest threat to the gorilla lies in destruction of the habitat by agriculturalists and by the intrusion of large herds of domestic cattle. (2:322)

Protective measures already taken: Placed in Class A by the 1933 London Convention. Fully protected in the Parc National Albert which was enlarged in 1929 primarily for the preservation of the gorilla in the Virunga Volcanoes. In 1930, a gorilla sanctuary of 18 sq. miles was established on the Uganda side of the Virunga Volcanoes. (2:320-323)

Measures proposed: If violation of the habitat is allowed to continue, the consequences will be disastrous to the gorilla in certain areas such as the Virunga Volcanoes. It is essential that the existing reserves should be adequately protected and regarded as inviolate; if possible they should be extended to embrace more of the animal's natural range. The newest threat to the gorilla and for that matter also to the chimpanzee and other primates, is the collecting by medical institutes. (2:320-322)

Number in captivity: 6 ♂♂ and 5 ♀♀ living in 5 zoos. (3:377)

Breeding potential in captivity: There appears to be no reason why the mountain gorilla should not breed as successfully in captivity as the lowland gorilla.

References:

1. Coolidge, 1929
2. Schaller, 1963
3. Jarvis, 1965

GIANT ARMADILLO

Priodontes giganteus (Geoffroy, 1803)

Order EDENTATA

Family DASYPODIDAE

Distinguishing characteristics: "This species is the largest of the present day armadillos. It is known to reach a length of four feet exclusive of the tail. The scutes of the carapace are of a uniform size and shape and this fact together with the close apposition of the movable bands, of which there are some 11 or 12, makes the bands inconspicuous. The manus is greatly modified for digging. The third digit bears a large sickle shaped claw." (1:75)

Present distribution: "In the greater part of eastern South America, from southeastern Venezuela and the Guayanas, as far as northeastern Argentina, in Misiones, Formosa and Chaco." (3:218) "... is usually found near water." (4:496)

Former distribution: "Formerly it occurred in the Province Cordoba, where Burmeister described a specimen." (3:218)

Status: "These giants are animals of the plains and the edges of the virgin forests. Rarely are they encountered in the north-east Argentine province of Misiones; in Paraguay, they are met more often than in Brazil. Whilst working near the Taquari River we heard of about 4 giant armadillos in two months." (2:73)

Estimated numbers: Unknown.

Breeding rate in wild: "Krieg reports the number of young to be one or two; the female has two mammae. The young are born with tough, leathery skin." (4:496)

Reasons for decline: "Unfortunately there are many indications that this species is being hunted down for a variety of reasons. The meat is appreciated: the claws are supposed to possess magical powers." (2:73)

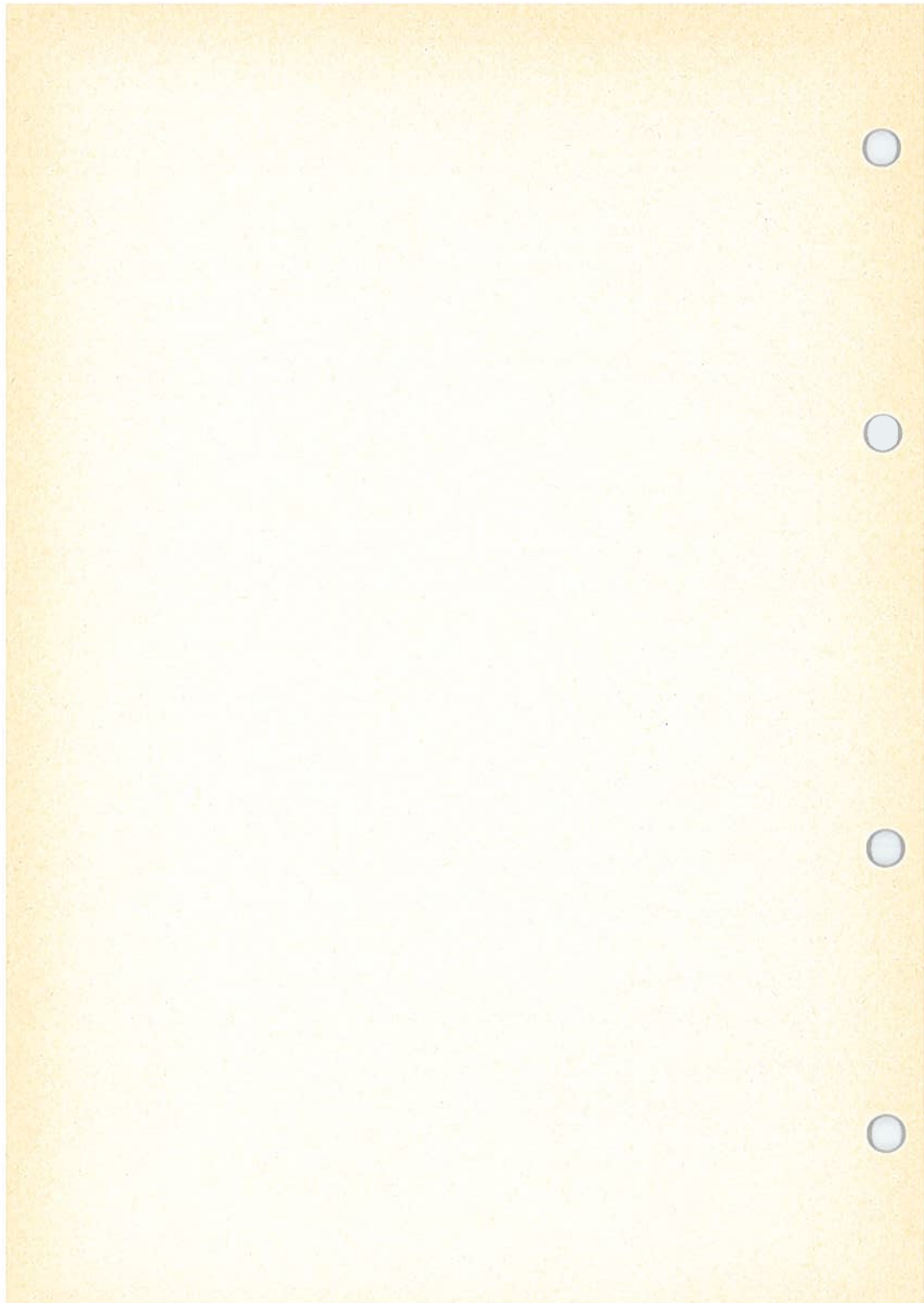
Protective measures already taken:

Measures proposed: "These armadillos should be protected as they destroy harmful insects and snakes." (4:496)

Number in captivity

Breeding potential in captivity:

- References:
1. Talmage & Buchanan, 1954
 2. Herre, 1963
 3. Cabrera, 1957-60
 4. Walker, 1964



LESSER PICHICIEGO

Chlamyphorus truncatus Harlan, 1825

Order EDENTATA

Family DASYPODIDAE

Distinguishing characteristics: " ... 6" long, mole-like, small tail. Armour of about 20 pink horny plates transversely arranged and attached only to the spine. Hind-end abruptly truncated and armoured. Silky white fur covers body even under horny plates. Eyes and ears small, hidden in fur. Lives underground." (2:87) (For a more detailed description see 1:541)

Present distribution: "The single species, C. truncatus, is found only in the warm, dry, sandy plains of central western Argentina, where thorn bushes and cactus are plentiful." (4:501)

Former distribution:

Status: Slade mentions its "singular scarcity." (1:541) "There is some evidence that these armadillos are declining in number and are now rare." (4:501) "One hesitates to hazard a guess whether or not this animal is rare as it lives so hidden away: certainly it is seldom caught." (3:73)

Estimated numbers: Unknown.

Breeding rate in wild: "Females have two mammae." (4:501)

Reasons for decline: "Its extinction is chiefly threatened by the advance of civilization with its attendant dogs and the plough." (4:501)

Protective measures already taken:

Measures proposed:

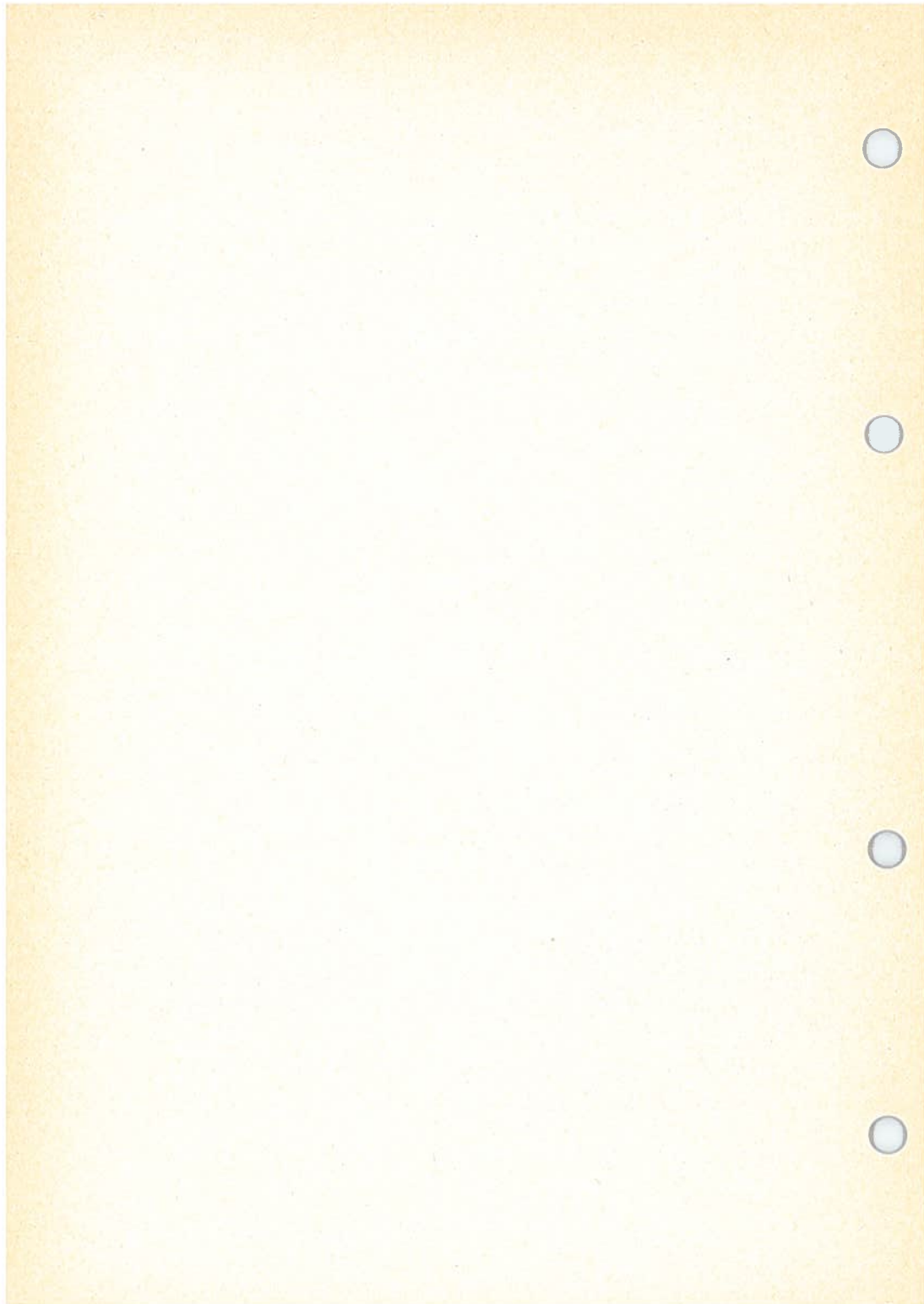
Number in captivity: "Chlamyphorus is difficult to keep alive in captivity." (4:501)

Breeding potential in captivity:

Remarks: "Our knowledge of its habits is very limited. It is nocturnal; it passes most of the time in the sand-burrows which it makes; is extremely timid; is rarely seen, and very rarely captured, except when accidentally discovered nestled within the blankets of Indians who are sleeping on the ground. Its food is said to be chiefly that of worms, and in this respect, as much as in its general subterranean habits, it resembles the European mole." (1:541)

References:

1. Slade, 1891
2. Burton, 1962
3. Herre, 1963
4. Walker, 1964



LIUKIU RABBIT

Pentalagus furnessi (Stone, 1900)

Order LAGOMORPHA

Family LEPORIDAE

Distinguishing characteristics: "On the basis of two specimens in the U.S. National Museum, the head and body length ranges from 430 to 510 mm., with a tail about 15 mm. in length. The ear is small to medium, about 45 mm. in length. The fur is thick and woolly. It is dark brown above, becoming more reddish brown on the sides. The underside is a light reddish brown. The claws are unusually long for rabbits (10 to 20 mm.), heavy, and curved." (1:652)

Present distribution: Occurs exclusively on two Japanese islands: Amami Oshima and Toku-no-Shima, situated south of the island of Kyūshū. (2)

Former distribution: Believed to have been the same. (2)

Status: The species is regarded as stable in certain parts of Amami Oshima but on Toku-no-Shima it is on the verge of extinction. (2)

Estimated numbers: Assessed at approximately 500 - 900 animals. (2)

Breeding rate in wild: There is insufficient data to enable the breeding season to be defined with certainty. It is said that the females bear only a single young. (2)

Reasons for decline: Until 1921 the rabbit was hunted extensively for meat as well as on account of its reputed medicinal properties. In recent years deforestation of the habitat and the increasing number of stray dogs have seriously affected the species. (2)

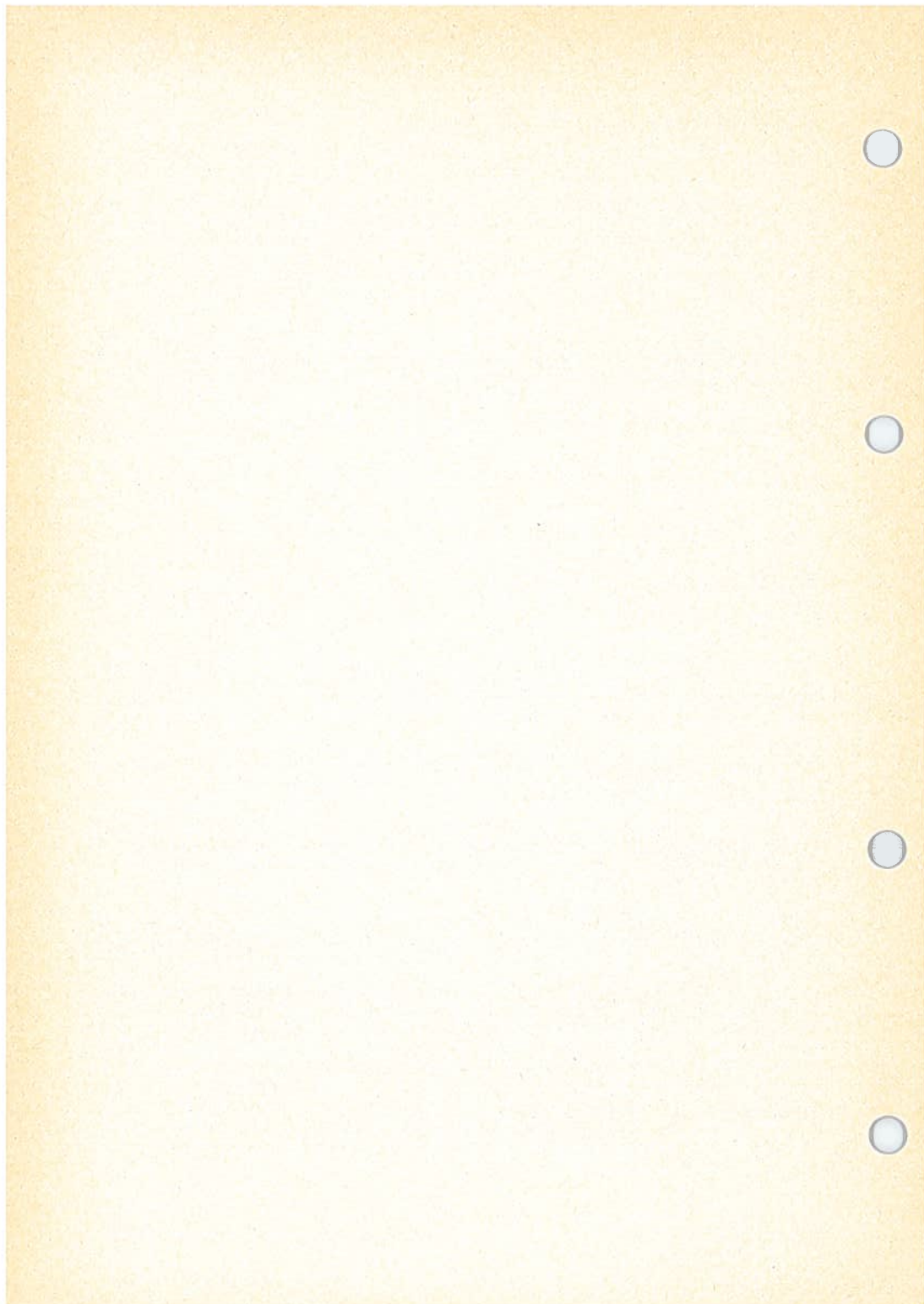
Protective measures already taken: In 1921 the rabbit was officially designated a Special Natural Monument, thus ensuring complete protection against shooting and capture. (2)

Measures proposed: The establishment of special reserves embracing the forested habitat, as well as a programme for the eradication of stray dogs from the islands. (2)

Number in captivity: A single specimen was captured for experimental purposes and is kept at the Lower Secondary School in Amami Oshima. (2)

Breeding potential in captivity: Although various attempts have been made to breed the animal outside the islands, none has yet succeeded. It is particularly important that further efforts should be made to breed the rabbit either in captivity or on a larger scale in a special enclosure to be constructed in a suitable part of the natural habitat. (2)

References: 1. Walker, 1964
2. Shigeru Miyachi, Sec.-Gen. National Commission for Protection of Cultural Properties, Japan, in litt. 16/3/64



VOLCANO RABBIT : TEPORINGO

Romerolagus diazi (Diaz, 1893)

Order LAGOMORPHA

Family LEPORIDAE

Distinguishing characteristics: "Utterly unlike any other member of the Leporidae in Mexico. Fur uniformly dark brown on back, dark brownish gray below. Ears short (40 to 44 mm.) and rounded, legs and feet short. No visible tail. Measurements: head and body - 270 to 315 mm.; tail rudimentary." (1:358)

Present distribution: "Middle slopes of Popocatepetl and Ixtacihuatl, and adjoining ridges bordering the Valley of Mexico on the east and south. This rabbit occurs in open pine forests undergrown with a heavy ground cover of zacaton grasses (Epicampes and Festuca), usually between 9,000 and 10,500 feet elevation, in the boreal zone." (1:358)

Former distribution:

Status: "The volcano rabbit has perhaps the most limited range of any mammal in Mexico. It occupies only one habitat type - the pine-zacaton association on the rim of the Valley of Mexico." (1:358) Very rare. (2:97)

Estimated numbers: Unknown.

Breeding rate in wild: "The breeding season is in the spring and early summer - March to June or early July. Paulino Rojas collected pregnant females in May and June. Villa suggests that the gestation period is probably a month more or less. Litters average about three young (1 to 4)." (1:361)

Reasons for decline: "How numerous the teporingo may once have been in its limited habitat is not known; but it is certain that in recent decades two factors have reduced it to a dangerous state of rarity. One is encroaching agriculture, for gradually the zacaton farther and farther up the mountain-sides is being burned to make way for maize. Even more of a menace is the growing interest in shooting on the part of Mexico City's bursting population. More and more people are invading the teporingo's habitat - ostensibly after quail and other game birds, but they find the teporingo useful for target-practice. ... The country people of the mountains regard the teporingo simply as vermin to be killed off." (2:97) "Neither gunners nor the natives eat them, why I do not know. It has been suggested that the diet of strong mint perhaps spoils the flavor. Villa speaks of coming across a band of city hunters along the Mexico-Cuernavaca highway with twenty-seven volcano rabbits they intended to feed to their dogs. Such wanton destruction of this interesting little animal hardly seems warranted." (1:361)

Protective measures already taken: "Nominally the little rabbit is 'completely protected' ..." (2:97)

Measures proposed: "It would certainly be very valuable if some specimens could be found and kept in the Chapultepec Park Zoo or elsewhere." (2:97)

Number in captivity:

Breeding potential in captivity:

Remarks: " ... it lives in burrows in the ground or under rock piles, traversing the dense bunchgrass by way of an intricate system of well-kept surface runways. Everyone who has studied the volcano rabbit has commented upon its resemblance to the northern pika, or cony (Ochotona), another high mountain Leporid with short ears, no tail, and a propensity to frequent rock piles. The resemblance goes farther in that both the volcano rabbit and the pika have high-pitched, penetrating voices, which they use frequently. No other member of the Leporidae is normally vocal." (1:358-360)

References: 1. Leopold, 1959
2. Pelham Wright, 1965

ASSAM RABBIT

Caprolagus hispidus (Pearson, 1839)

Order LAGOMORPHA

Family LEPORIDAE

Distinguishing characteristics: "The ears are unusually short, only 2 inches long, the feet are $3\frac{3}{4}$ inches long, the tail, including the hairs, measures only $1\frac{1}{2}$ inches. ... The color of the Harsh-furred Hare is rather dark, a mixture of dull brown, blackish, and numerous scattered whitish bristly hairs; the underparts are buffy gray, the feet and hands dull brown, and the ears lack the light-colored fringes commonly seen in Lepus. The tail is brown, without white beneath. The length of head and body is only 15 to 20 inches. ... The animals are reputed to make burrows but the claws seem too long and slender for digging." (1:203)

Present distribution: Unknown. (2)

Former distribution: India - Uttar Pradesh to Assam, at base of Himalayan foothills; and south to Dacca (East Pakistan). (2)

Status: Probably extinct. (2)

Estimated numbers: Probably nil. (2)

Breeding rate in wild: "The number of nipples has been reported to vary from 6 to 10." (1:203)

Reasons for decline: Loss of habitat due to cultivation and grazing. (2)

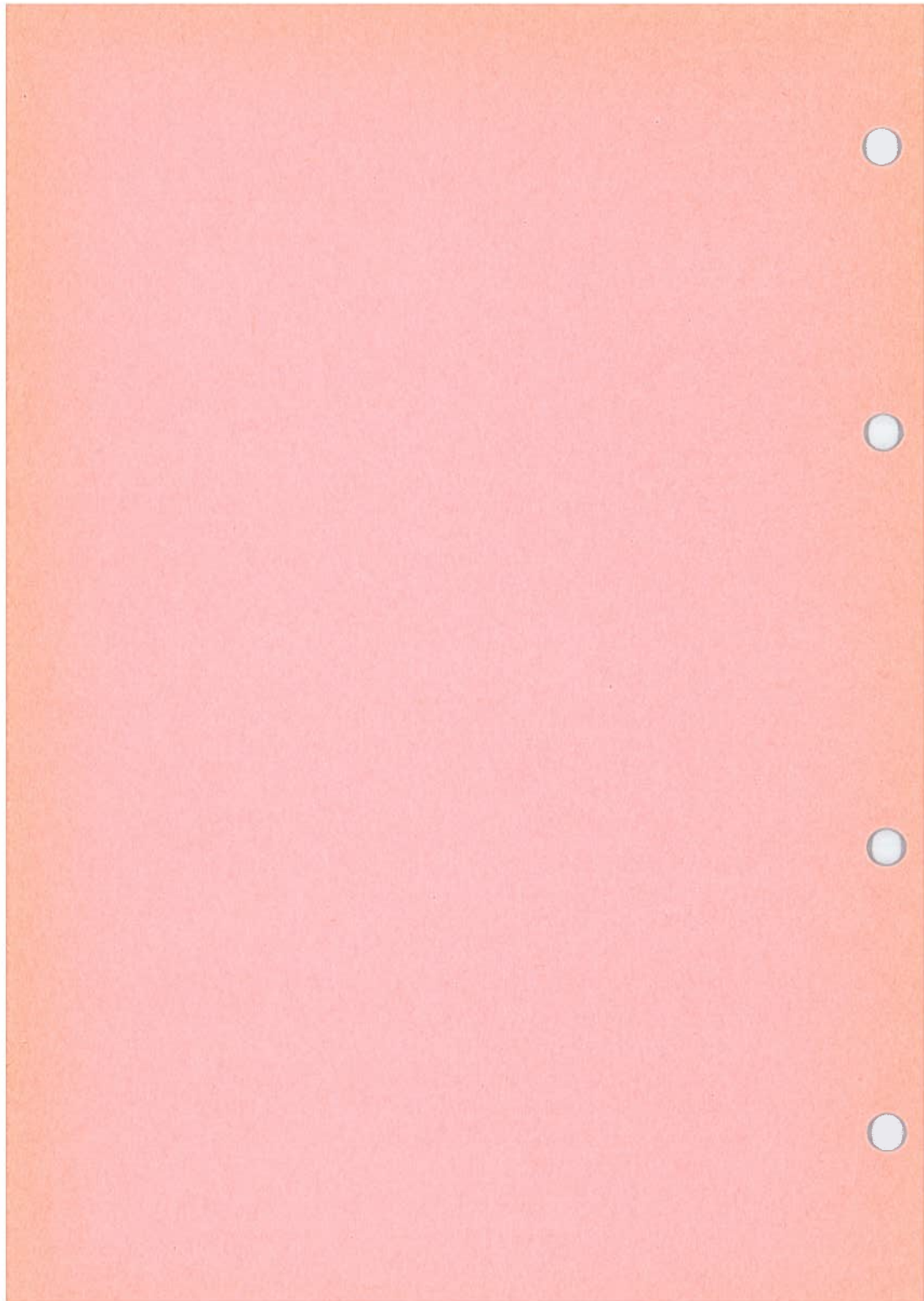
Protective measures already taken: None.

Measures proposed: None.

Number in captivity: None.

Breeding potential in captivity: Unknown.

References: 1. Tate, 1947
2. E.P. Gee in litt. 10/6/63



SHORT-EARED RABBIT

Nesolagus netscheri Schlegel, 1880

Order LAGOMORPHA

Family LEPORIDAE

Distinguishing characteristics: "Sumatran hares are rather small, with a head and body length of about 360 to 400 mm., and an inconspicuous tail measuring about 15 mm. The ears are short. The pelage consists of a soft, dense underfur overlaid by longer, harsher hairs. It has the most definite pattern of any member of the order. The general coloration above is buffy gray on which there are several brown stripes, including a mid-dorsal stripe from snout to tail. Another broad stripe curves from the shoulder upward to the rump region. A third runs from the rump down onto the hind leg. A narrow stripe runs from the shoulder part way down the upper fore leg. In addition, the rump and tail are bright red. The limbs are gray-brown. The underside of the neck is dark brown and the remaining under parts are buffy white." (4:664)

Present distribution: The seven specimens obtained by Jacobson were all collected in the highlands of the Barisan Range in southwestern Sumatra. (2:296 and 3:235) "The altitude at which the animal has been found ranges from 600 to 1,400 metres." (2:295)

Former distribution: Does not appear to have been recorded elsewhere than the Barisan Range.

Status: "The only occasions when it has been seen were during the clearing of forests and coffee estates. It is so rare that there is no native name for it." (1:6)

Estimated numbers: Unknown. The 7 collected by Jacobson brought "the number of specimens in Museums, as far as I have been able to ascertain, to a total of thirteen." (3:236)

Breeding rate in wild:

Reasons for decline: Clearance of the indigenous forest for purposes of cultivation appears to have eliminated the species from areas in which it was once relatively abundant. (2:293-294)

Protective measures already taken:

Measures proposed:

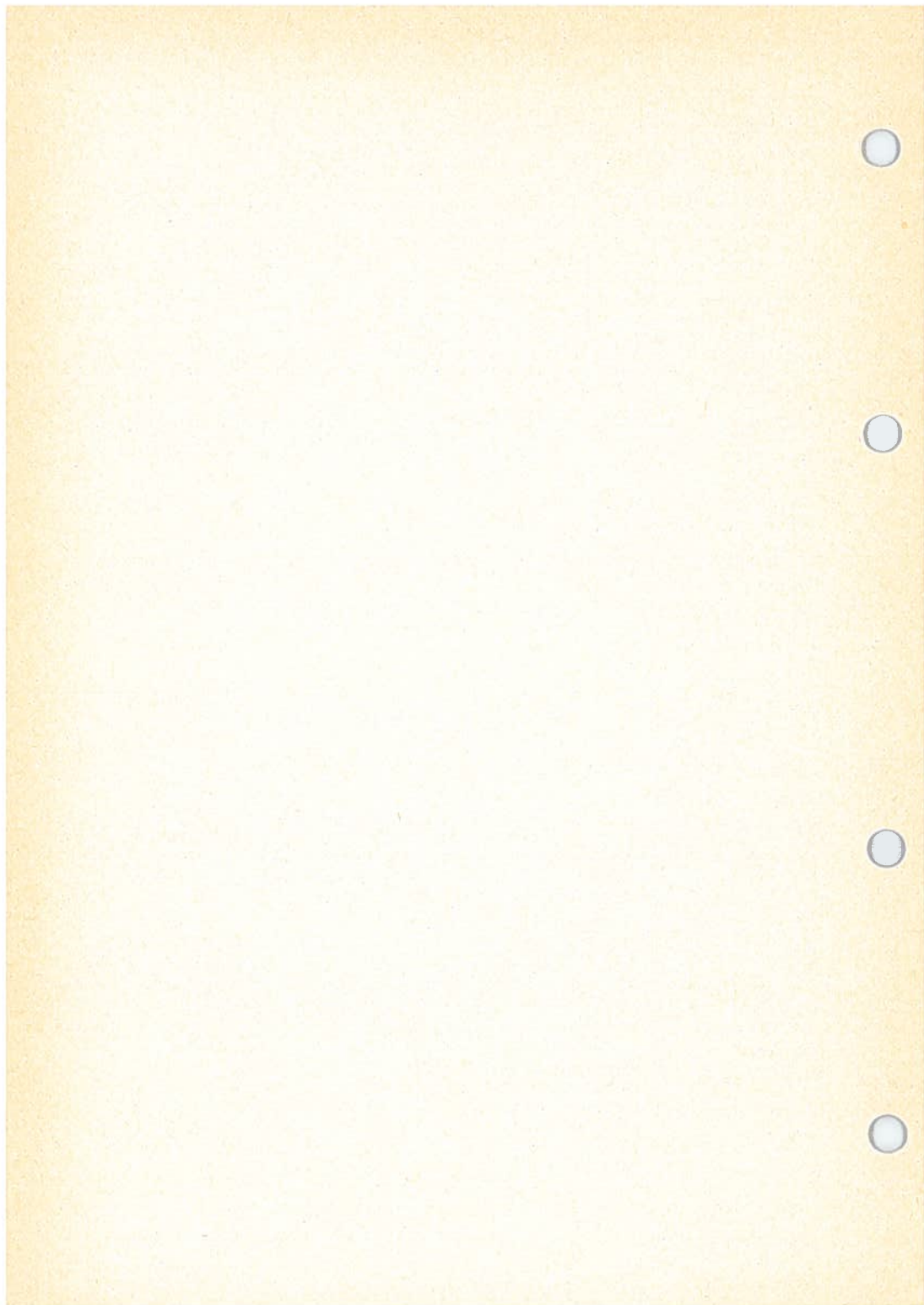
Number in captivity: The species apparently survives well in captivity as the "manager of the coffee-estate Bukit Gompong, on Gunung Talang, informed me that in clearing the forest his coolies had in former years repeatedly obtained living specimens which he had been able to keep alive for a considerable time, some of them for a whole year." (2:293)

Breeding potential in captivity:

Remarks: "These rabbits are nocturnal. They feed on succulent stalks and leaves of certain forest undergrowth. During the day they rest in burrows on the forest floor. It is believed they use burrows made by other animals, rather than digging their own. They do not seem to be as quick in their movements as the European hare, Lepus europaeus." (4:664)

References:

1. Jacobson, 1917
2. Jacobson & Kloss, 1919
3. Jacobson, 1921
4. Walker, 1964



KAIBAB SQUIRREL

Sciurus kaibabensis Merriam, 1904

Order RODENTIA

Family SCIURIDAE

Distinguishing characteristics: "In its general appearance it resembles Abert's squirrel, but the under parts are mainly black instead of white, and the tail is practically all white instead of on the under side only. The back is dark grizzled gray, with a wash of ferruginous from shoulders to rump. The ears are blackish in summer but rimmed anteriorly with gray in winter; the ear tufts are black, the face, fore feet, and toes mixed gray and black; hind feet in summer mainly gray but in winter mainly black. The tail is ample and bushy, white, with an indistinct buffy-gray stripe down the middle of the upper side. Size about that of a gray squirrel." (1:42)

Present distribution: "... confined to the Kaibab Plateau of the northern side of the Grand Canyon, Arizona, in an area approximately 70 miles long and 30 miles wide." (2:386) Their range is "closely associated with yellow pines. Apparently restricted to Kaibab National Forest and Grand Canyon National Park lands." (4:28)

Former distribution: "Probably the same since historic times." (4:28)

Status: "Rare and restricted in range." (4:28) "The squirrel population fluctuates from year to year for reasons unknown. Dr. Joseph G. Hall ... writes (August 7th, 1964) that, in his opinion, the population was at its highest about 30 years ago, and that it 'is now at its lowest ebb in a half century'." (4:28)

Estimated numbers: "Approximately 1,000." (4:28)

Breeding rate in wild: "One or two litters (3-4 each) annually." (4:28)

Reasons for decline: "Unlike other squirrels, it has not learned a healthy respect for automobiles." (3:132) This factor and disease are the most notable causes of decline. (4:28)

Protective measures already taken: Completely protected by law. (1:44) "American museums limit themselves to accident victims for supply of specimens." (3:132) "Efforts to introduce the animals elsewhere - southern Utah, for example - happily have thus far proved unsuccessful." (2:386)

Measures proposed: Since this squirrel feeds almost entirely on the cambium layer of the yellow pine, efforts should be made to assure a constant supply of this tree. (5)

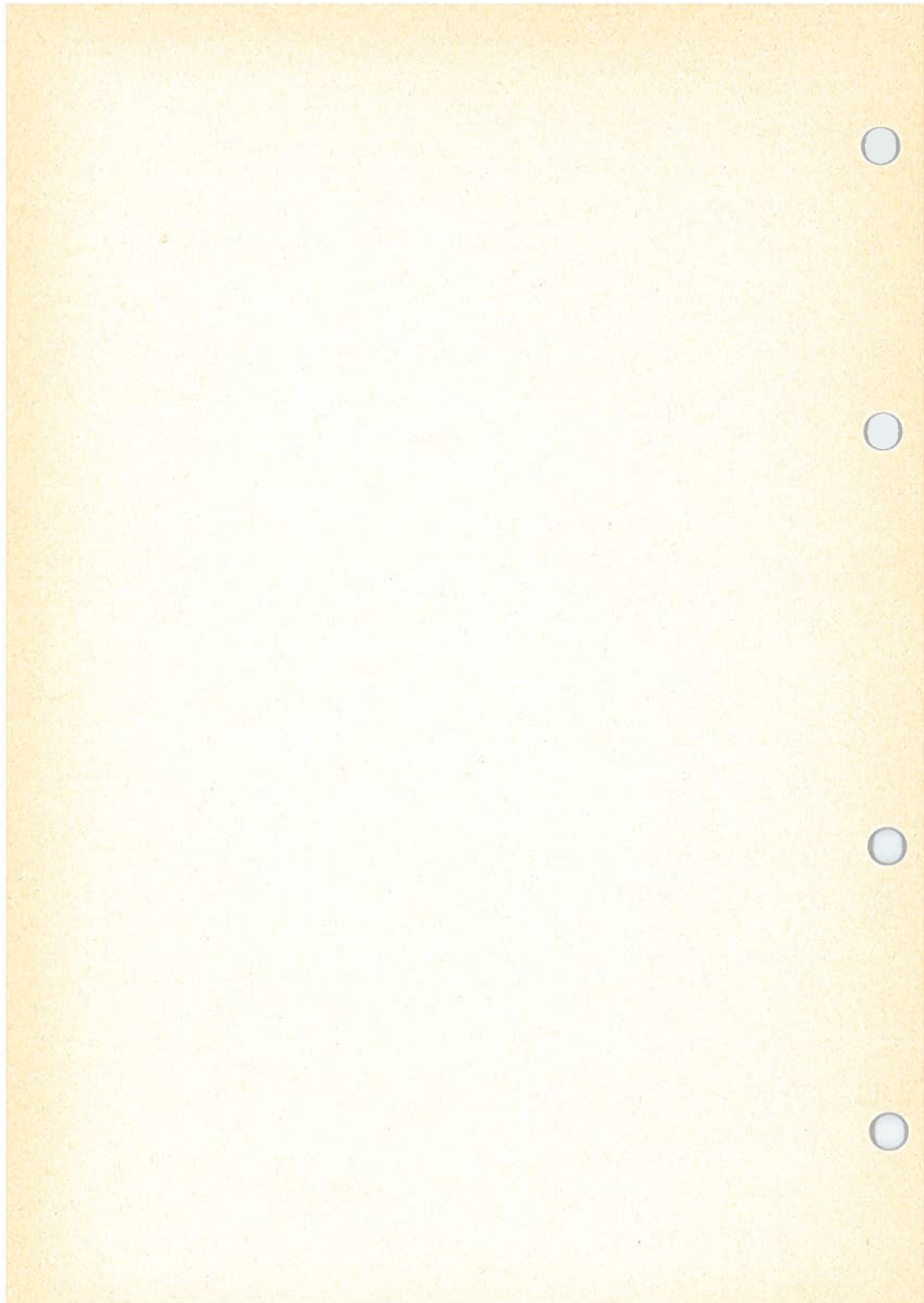
Number in captivity: 5 - 10. (4:28)

Breeding potential in captivity: Good. (4:28)

- References:
1. Allen, 1942
 2. Hall & Kelson, 1959
 3. Matthiessen, 1959
 4. U.S. Fish & Wildlife Service, 1965
 5. R.H. Manville in litt. 24/10/63

Status category: 2(a)PR

Code number: MA/55/SCIUR/KAI



DELMARVA PENINSULA FOX SQUIRREL

Sciurus niger cinereus Linnaeus, 1758

Order RODENTIA

Family SCIURIDAE

Distinguishing characteristics: "Similar to, but larger than the gray squirrel; coloration uniform light grizzled-grayish above, with a steel blue cast; belly and feet white; tail with a pronounced black stripe on outer edges. A melanistic form occurs in which the belly and back are black." (3:1)

Present distribution: "... found in only six of Maryland's Eastern Shore counties, (Kent, Queen Anne's, Talbot, Dorchester, Wicomico and Somerset)." (2:6) "The northernmost colony is located in Kent County on Eastern Neck Island, southeast of Baltimore across Chesapeake Bay. The island is roughly two by three miles in dimension and is composed of about one-half agricultural land and one-half marsh and woodland ... About 10 - 12 miles south of Eastern Neck Island there is another small colony on Wye Island in Queen Anne's County. These seem largely to be confined to a strip of loblolly about 75 acres in extent. In addition to these insular populations at the northern edge of their range, the Peninsula fox squirrel occurs over parts of Talbot and Dorchester Counties to the south. All told, I suspect that a land strip of 50 - 75 miles in length and 25 miles in width would cover the distribution spread of the subspecies." (4)

Former distribution: "... once widespread over Maryland's Eastern Shore, Delaware, and southeastern Pennsylvania." (2:6)

Status: "... this race is so localised, with little or no likelihood of its increasing its range ... [and] threatened with gradual encroachment on its available habitat. For this reason it is likely in time to become more and more restricted, with little possibility of long survival unless given special protection." (1:46) "Seems in danger of immediate extinction." (2:6)

Estimated numbers: "I judge the squirrel population would be measured at a few hundred at most [on Eastern Neck Island. Dorchester County] has the largest population which quite likely can be measured in the low thousands." (4)

Breeding rate in wild: "One or two litters of two to four young per year." (3:1)

Reasons for decline: "The future of Maryland's mammals is one of steadily diminishing living space with much of this space being defiled so badly that it will be unsuitable for wild mammals ... The most probable reason for the decline of the Bryant squirrel was the cutting of heavy timber during the last century." (2:6)

Protective measures already taken: Occurs in the Blackwater National Wildlife Refuge, Cambridge, Md. (1:46)

Measures proposed: "Protection of mature forests is a highly desirable step for saving the Bryant squirrel." (2:6) On Eastern Neck Island, "as elsewhere, they appear to be closely associated with mature stands of loblolly pine - *Pinus taeda*. Logging has removed much of the better pine stands in recent years. At present, the Federal Fish and Wildlife Service is attempting to acquire the island as a waterfowl refuge. Such action would undoubtedly favour the animals through considerate woodland management and protection from hunting." (4)

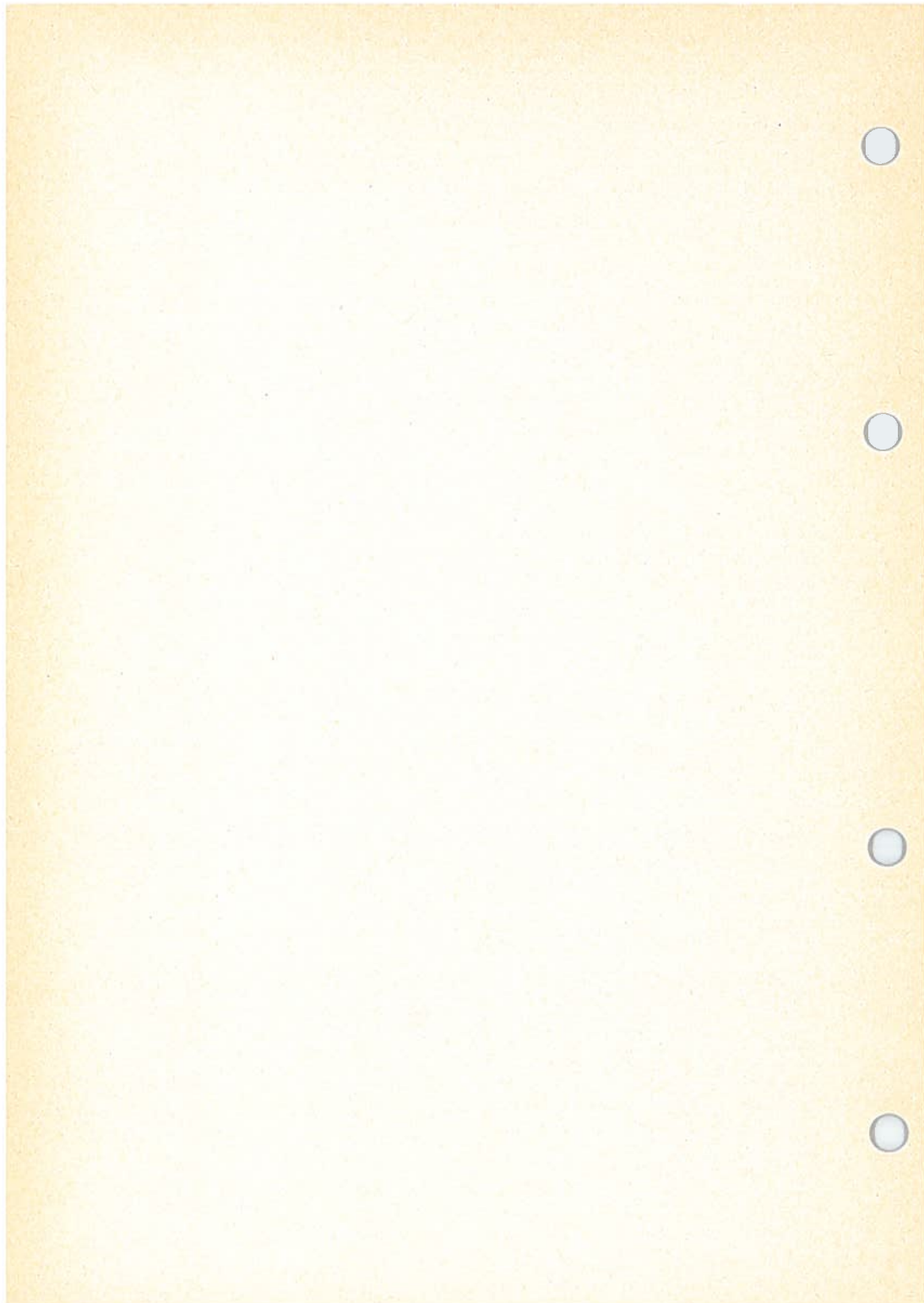
Number in captivity: Unknown.

Breeding potential in captivity: Good. (3)

References: 1. Allen, 1942 3. US Fish & Wildlife Service, 1965
2. Flyger, 1964 4. J.P. Linduska in litt. 4/9/64

Status category: 2(b)R

Code number: MA/55/SCIUR/NIG/CIN



EASTERN FOX SQUIRREL

Sciurus niger vulpinus Gmelin, 1788

Order RODENTIA

Family SCIURIDAE

Distinguishing characteristics: "The eastern fox squirrel is slightly larger than that of the Southeast and somewhat resembles a large gray squirrel. ... Distinguished from the more western race, rufiventer, by its white instead of rufous belly, and from the southern typical form by its rufous ears instead of white, and the usual lack of black color, though rarely entirely black individuals occur." (1:47)

Present distribution: Maryland (outside the range of cinereus), West Virginia, southern Pennsylvania and northern Virginia. (2:2)

Former distribution: "The eastern fox squirrel probably in former times just reached southwestern Connecticut, but has long since gone. Linsley (1842) in his list of the mammals of that State, knew it only from Northford, a century ago. In New York State it was formerly found in the southern parts in some numbers, as attested by Bachman in 1839." (1:47)

Status: "... gone from its more northern outposts, and is in danger of complete wiping out east of the Alleghenies." (1:47)

Estimated numbers:

Breeding rate in wild: "One or two litters of 2 - 4 young per year." (2:2)

Reasons for decline: "... numbers have constantly and slowly dwindled in recent decades, for not only is this species constantly in demand for food, but it is less adaptable to the changing conditions of clearing and settlement than its congener, the grey squirrel. It prefers primeval stands of old timber and is much given to foraging and travelling on the ground. Hunters often employ dogs to tree the squirrels, after which they may be shot with little difficulty." (1:48-49)

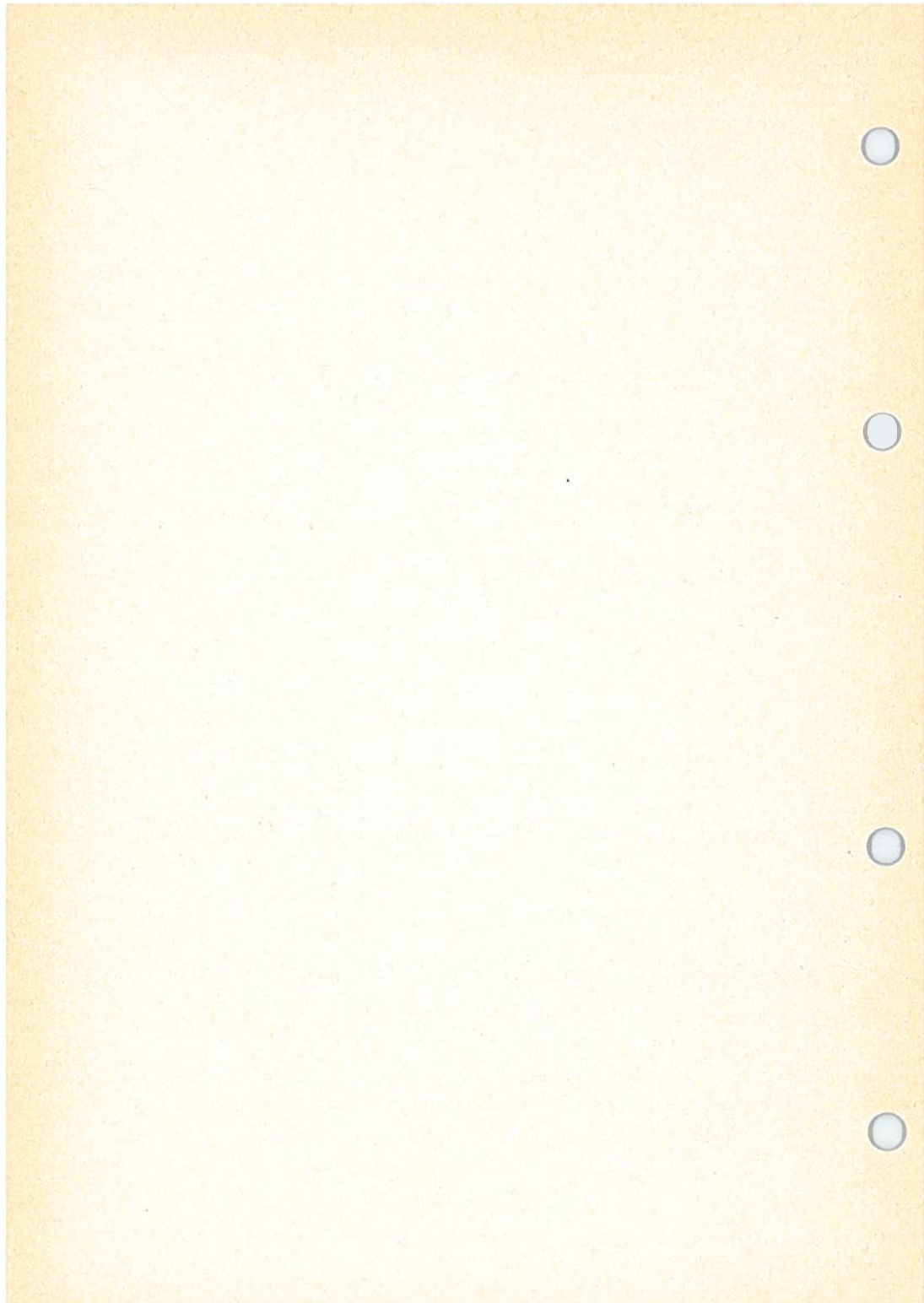
Protective measures already taken:

Measures proposed: Close hunting season and the establishment of refuges free from cutting. (2:2)

Number in captivity: Unknown.

Breeding potential in captivity: Good. (2:2)

References: 1. Allen, 1942
2. U.S. Fish & Wildlife Service, 1964



UTAH PRAIRIE DOG

Cynomys parvidens J.A. Allen, 1905

Order RODENTIA

Family SCIURIDAE

Distinguishing characteristics: "Upper parts cinnamon or clay color with mixture of buff and black-tipped hairs, usually slightly darker on rump; chin, sides of nose, and lips buffy white; upper side of tail proximally like rump, distal half white; underparts Cinnamon-Buff, grading to Cinnamon on pectoral and inguinal regions. Skull angular and robust; interorbital region broad; postorbital processes not abruptly projecting." (4:367)

Present distribution: A 1962 survey disclosed that the species occurred only in five counties of south-central Utah. (6)

Former distribution: In 1935, 36 parvidens occurred in nine counties in Utah and was found further west and south than then expected. (1:197)

Status: This species has never been widespread or abundant and is now apparently declining. Of the several species of prairie dogs, this one is the least common, most restricted, and subject to the least amount of interference. (6)

Estimated numbers: 2,775 animals were seen in nine towns. The largest concentration was observed on Packer Mountain with 1,500 prairie dogs on 10,000 acres (U.S. Fish and Wildlife Service - C.C. Presnall, in verbis, Oct. 1963). (6)

Breeding rate in wild: 4 - 6 young per litter annually. (6)

Reasons for decline: Vulnerable to poisons used in control operations. (3:201) Infected with sylvatic plague, August 1963 (2:69), but no mention of extent of population mortality. (6)

Protective measures already taken: Instructions have been issued to field agents to refrain from the control of this particular species. (6)

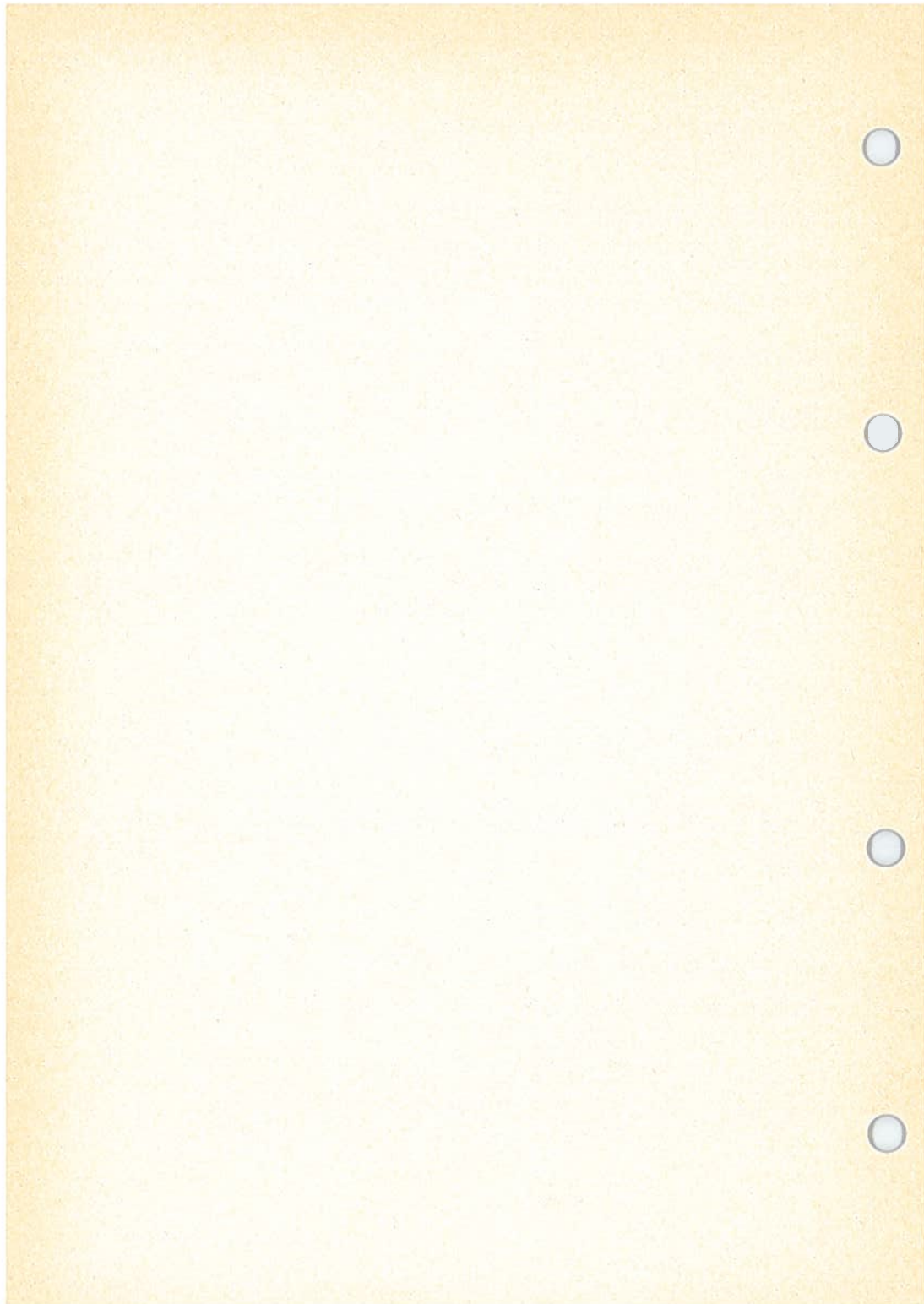
Measures proposed:

Number in captivity: Portland, U.S.A. 1. (5:378)

Breeding potential in captivity: Probably good. (6)

References:

1. Hardy, 1937
2. Allred, 1952
3. Mathiessen, 1959
4. Hall & Kelson, 1959
5. Jarvis, 1965
6. R.H. Manville in litt. 24/10/63



SALT-MARSH HARVEST MOUSE

Reithrodontomys raviventris Dixon, 1908

Order RODENTIA

Family CRICETIDAE

Distinguishing characteristics: "Upper parts pinkish cinnamon interspersed with black hairs, especially middorsally; underparts pinkish cinnamon or whitish; tail dark brown or blackish above, paler, sometimes almost white, below. As compared with R. megalotis longicaudus, its geographically nearest congener, R. raviventris differs cranially in larger skull with relatively shorter rostrum; nasals and incisive foramina shorter; and zygomata more widely spreading anteriorly." (1:588)

Present distribution: "Salt marshes of San Francisco, San Pablo and Suisun Bays, California, U.S.A." (2)

Former distribution: "Same as above." (2)

Status: "Declining." (2)

Estimated numbers: "Impossible to estimate with any accuracy." (2)

Breeding rate in wild: "Probably one to four litters per year per female. Three to four young per litter." (2)

Reasons for decline: "These mice are restricted to the salt and brackish marshes bordering the San Francisco Bay system. They apparently hold their own numbers against the adverse conditions of these habitats. They are well adapted to live in the marshes. However, much of this land is being 'reclaimed' for industrial and/or suburban development. The decline of this species is because of this continuing loss of habitat." (2)

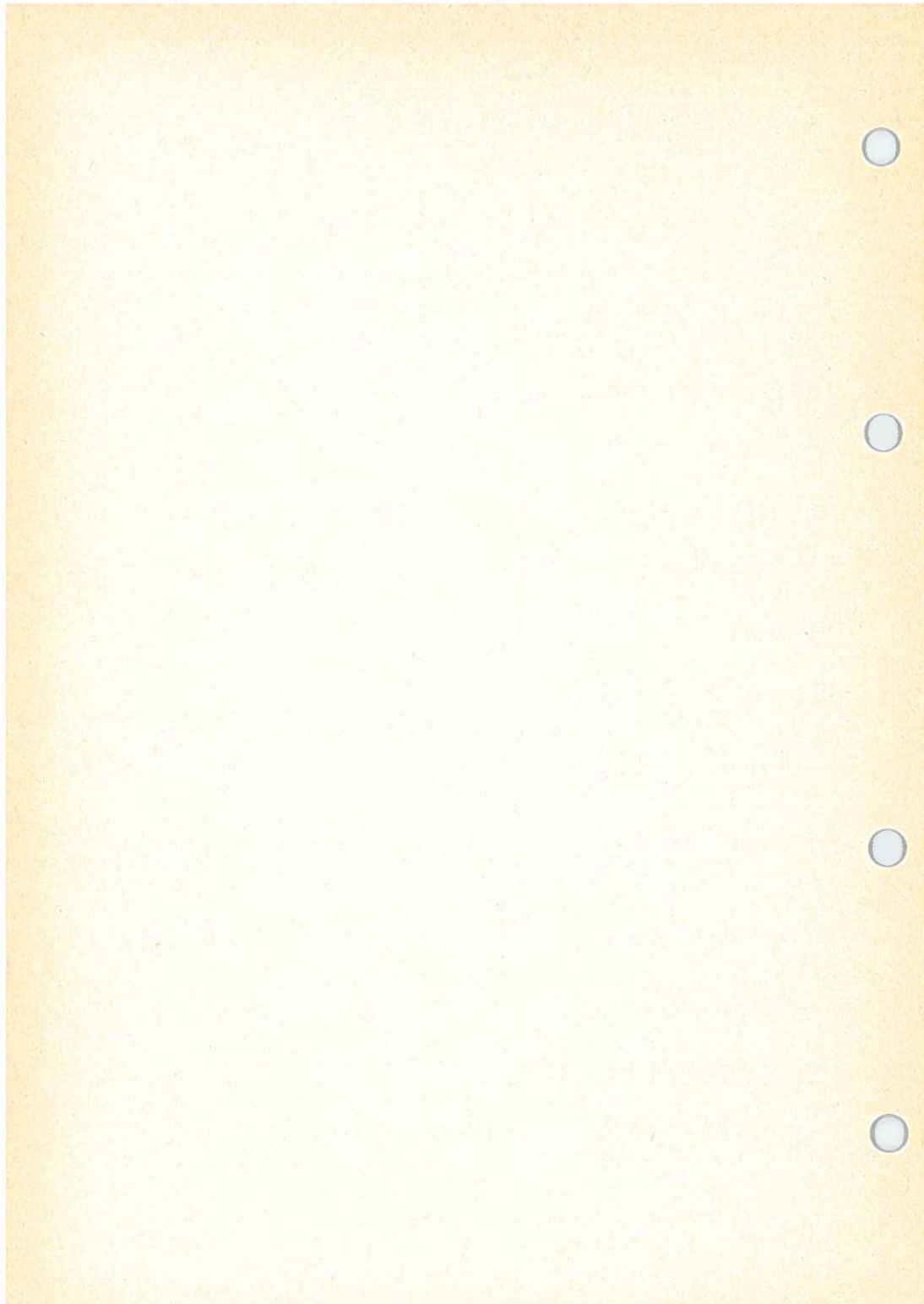
Protective measures already taken: "... small segments of suitable marsh are presently included in certain bird sanctuaries. This is not sufficient for the preservation of the species." (2)

Measures proposed: "None specifically for this purpose are proposed that I am aware of." (2)

Number in captivity: "Probably a few in use as experimental animals." (1)

Breeding potential in captivity: "Under appropriate conditions, these mice will breed well in captivity." (1)

References: 1. Hall & Kelson, 1959
2. Fidler, 1961



BLOCK ISLAND MEADOW VOLE

Microtus pennsylvanicus propectus Bangs, 1908

Order RODENTIA

Family CRICETIDAE

Distinguishing characteristics: "Minute differences (larger, gray belly) from the common meadow vole of mainland." (5:32)

Present distribution: Known only from Block Island, Newport Co., Rhode Island. (4:727) "Block Island is midway between Point Judith, Rhode Island, and Montauk Point, at the tip of Long Island, New York. It is approximately nine miles from either shore. The island is eight miles long and two to five miles wide." (1:587)

Former distribution: Possibly a relict formerly inhabiting the mainland coast (A.M. Greenhall). (7)

Status: Reported to be reduced in numbers and possibly endangered. (6:132)

Estimated numbers: Unknown.

Breeding rate in wild: "Female meadow mice may produce 13 litters a year. Breeding is promiscuous, and 4 - 8 young are born 21 days after mating, followed immediately by a new mating. Young are weaned when 10 - 15 days old. Females may breed when 25 days old; males at 45 days. One female is believed to be able to produce 100 mice a year ... the life expectancy is thought to be about 1 1/2 years." (3:105)

Reasons for decline: Changing conditions on Block Island, such as buildings, roads, or the effects of storms and hurricanes may be responsible (7) ... "cultivation has altered habitat." (6:32)

Protective measures already taken: None. (6:32)

Measures proposed: "Measures should be taken to encourage the continued existence of suitable perennial grass habitat." (6:32)

Number in captivity:

Breeding potential in captivity: "The mounting search for laboratory animals has found in the meadow mouse an extremely useful subject. Under controlled conditions, various forms have been found to breed freely in captivity and are now produced in numbers. ... Bailey (1924) reports that a female eastern meadow mouse (Microtus pennsylvanicus) produced seventeen litters within a year at three-week intervals." (5:235)

Remarks: Although recognised by Miller and Kellog as a full species (2:589), Chamberlain regards propectus as a race of M. pennsylvanicus. (1:589)

- References:
1. Chamberlain, 1954
 2. Miller & Kellog, 1955
 3. Palmer, 1957
 4. Hall & Kelson, 1959
 5. Crandall, 1964
 6. US Fish & Wildlife Service, 1965
 7. R.H. Manville in litt. 24/10/63



BEACH MEADOW VOLE

Microtus breweri (Baird, 1858)

Order RODENTIA

Family CRICETIDAE

Distinguishing characteristics: "This insular species is closely related to M. pennsylvanicus and is said to differ as follows: paler, longer, and coarser pelage; anteriorly wider nasals; and longer interparietal." (3:728)

Present distribution: "Muskegat Island, the only locality in which Microtus breweri is known to occur, lies at the extreme western end of Nantucket. It is fifteen miles west of the town of Nantucket, eight miles southeast of the extreme eastern point of Martha's Vineyard, and thirty miles south of Cape Cod. From the western end of Nantucket, Muskegat is separated by six miles of very shallow water interrupted about midway by Tuckernuck Island and on the south side partly cut off from the ocean by long narrow beaches. Although these beaches are constantly changing in form and position ... a land communication is never established between the three islands." (1:76)

Former distribution: Possibly a relict species once inhabiting a now vanished sandplain extending along the coast from New Jersey to Newfoundland. (2:93) "Muskegat, including Adams and South Point Islands." (6:31)

Status: One collected on Muskegat Island during the summer of 1956, (5:270) indicating that the species may have recovered, perhaps as a result of the transplant by G.S. Miller in 1893. (?)

Estimated numbers: Apparently the population underwent violent fluctuations as do meadow voles on the mainland, varying from "excessively abundant" in 1869 to "no trace" of them in 1890/91: a "thriving colony" in 1892 had "entirely disappeared" in 1893. (1:80-81)

Breeding rate in wild: "... the breeding season of M. breweri probably lasts throughout the warmer months. During the last week in June and first week in July, all the adult females are either pregnant or nursing while the young are of every size up to those nearly half grown. Four or five young is the usual number in a litter." (1:82)

Reasons for decline: "It is vulnerable to feral house cats, short-eared owls and storms, its small world, like that of the Ipswich sparrow, may one day erode away." (4:131) Possibly the intensity of hurricanes during the past 25 years may have increased land erosion; increased building construction would be harmful to the species (A.M. Greenhall). (?)

Protective measures already taken: "Muskegat Island is now a refuge for nesting terns." (6:31)

Measures proposed: "Continued maintenance of refuge: elimination of cats." (6:31)

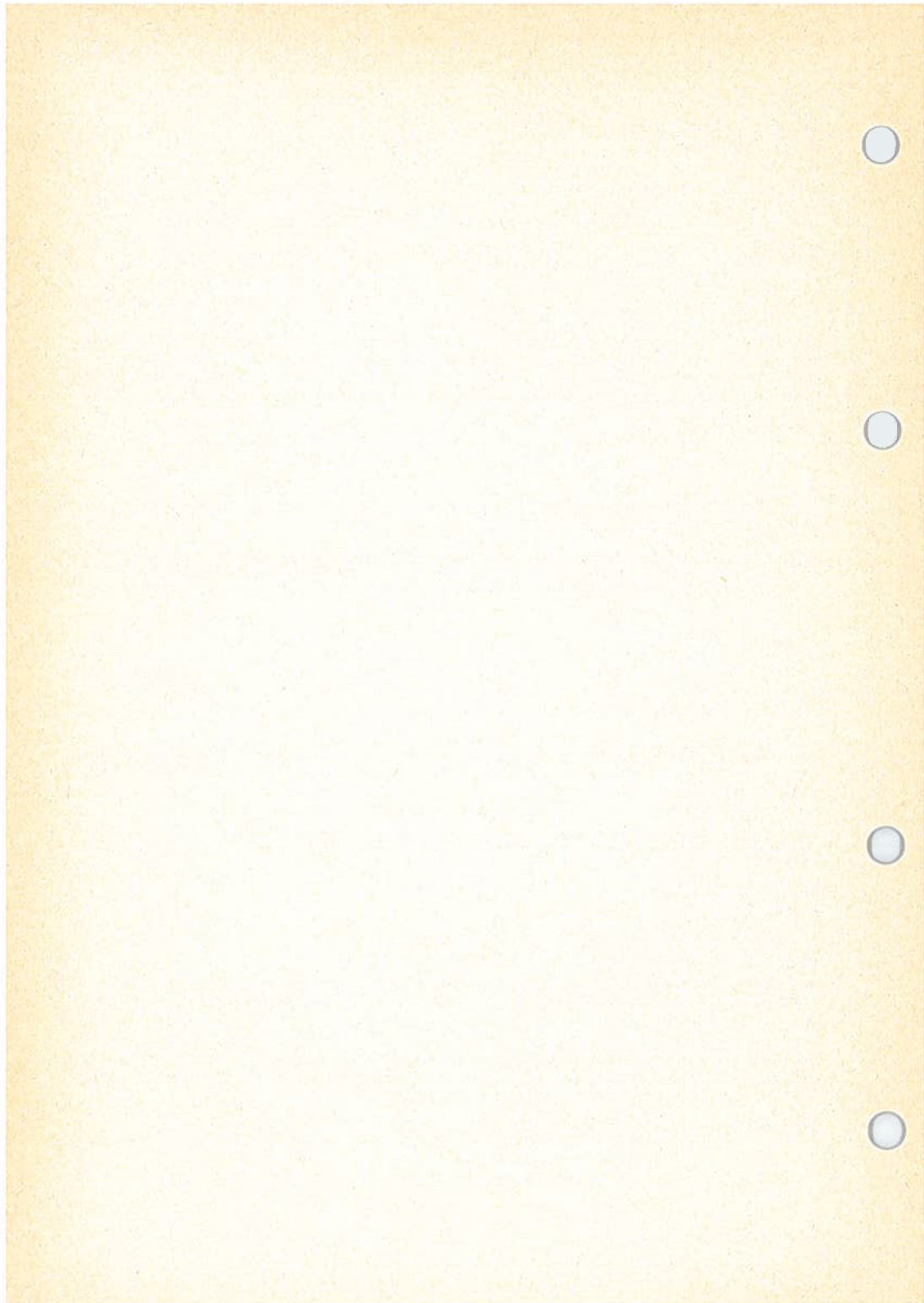
Number in captivity:

Breeding potential in captivity: Fair. (6:31)

Remarks: "The habits of the Muskegat beach mice have been modified to meet the needs of a life among coarse, loose sand, in which no extensive burrows can be made except during the brief and irregular periods in winter when the surface is frozen. Throughout the greater part of the year the animals are exposed to the full force of the elements, their only protection being that furnished by the scant vegetation or by fragments of driftwood and wreckage ... few small mammals live in as exposed situations." (1:81)

References:

1. Miller, 1896	5. Haft, 1963
2. Allen, 1942	6. U.S. Fish & Wildlife Service,
3. Hall & Kelson, 1959	1965
4. Matthiessen, 1959	7. R.H. Manville in litt. 24/10/63



CUVIER'S HUTIA

Plagiodontia aedium F. Cuvier, 1836

Order RODENTIA

Family CAPROMYIDAE

Distinguishing characteristics: "Cuvier describes P. aedium as of rather stout build, the head and body about a foot in length, the tail 5 inches and naked ... There were five claws on all four feet, although that of the thumb was a short, blunt nail. The pelage in P. aedium is described as thick, of fine silky hairs above, which were gray in the basal three-quarters, tipped with tawny and intermixed with longer all-black hairs. The under surfaces were paler and clearer, probably nearly buff. The mustachial hairs, as usual in this group, were long and abundant." (1:117)

Present distribution: The Dominican Republic and Haiti. (3:1037)

Former distribution: "Nothing is known of the habits and haunts of P. aedium beyond the few statements of Cuvier, to whom Ricord reported that in 'Santo Domingo' the animal was known a century ago as 'Rat-Cayes' or house rat, because it frequented settled areas ... it may have been that P. aedium was the animal of western and southern Hispaniola, and P. hylaeum that of the northeastern parts of the island ..." (1:119)

Status: "... first described in 1836 by the famous French naturalist, Cuvier, from a Haitian specimen. No others were seen for over a century, when a second species was collected. The original P. aedium of Cuvier was thought to be extinct until, in 1947, a second specimen was found in a region where native hunters described the species as not uncommon." (2:42)

Estimated numbers: Unknown.

Breeding rate in wild: Doubtless similar to P. hylaeum.

Reasons for decline: Allen states that because of its vegetarian diet its flesh was good to eat and the Haitians hunted it with such zeal that even in Cuvier's day it had already become very rare. (1:118) "Probably native hunting, plus predation by the introduced mongoose, and the clearing of the original forests, account for the scarcity of these peculiar animals ..." (2:42)

Protective measures already taken:

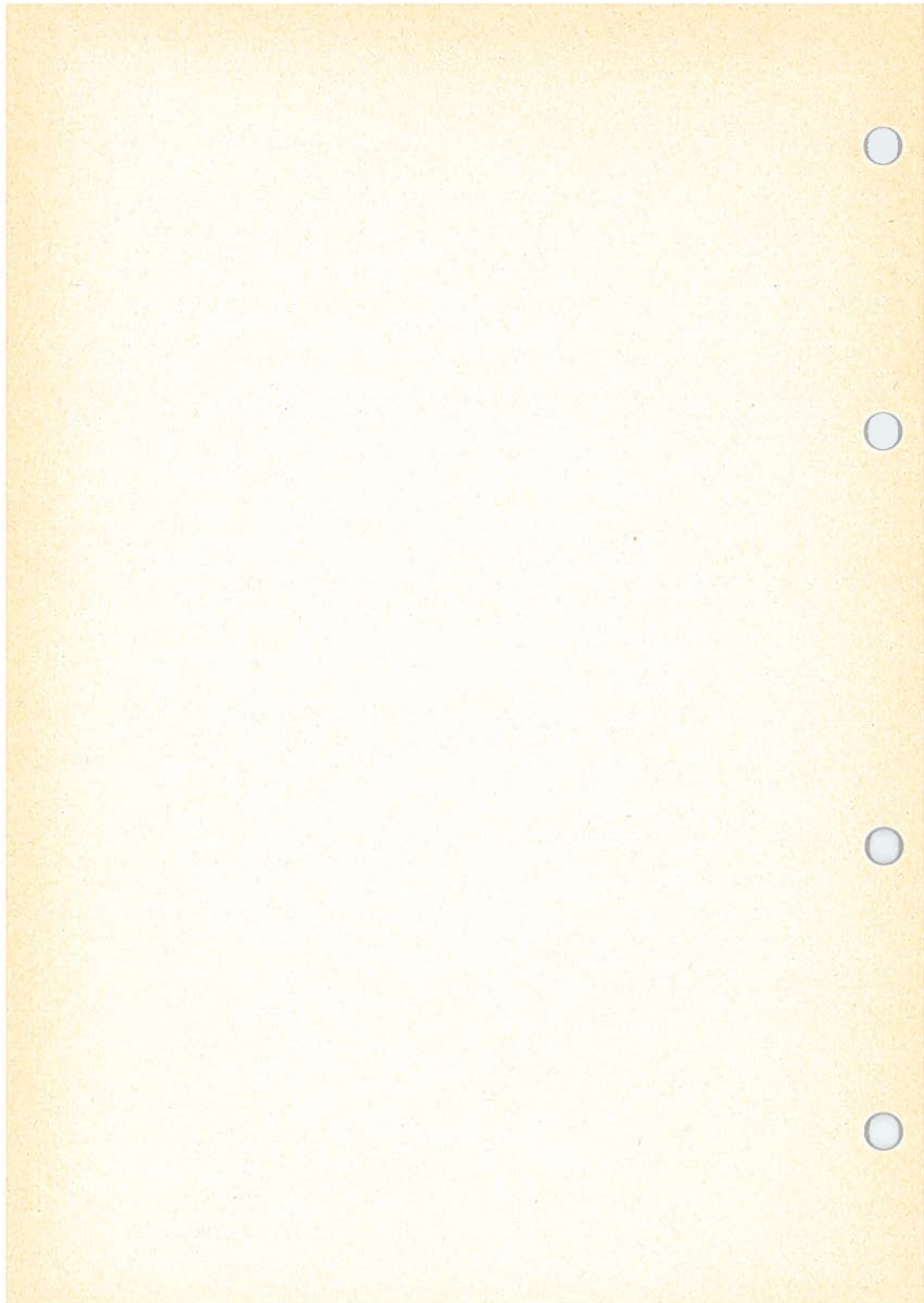
Measures proposed:

Number in captivity:

Breeding potential in captivity:

References:

1. Allen, 1942
2. Hayman, 1956
3. Walker, 1964



DOMINICAN HUTIA

Plagiodontia hylaeum Miller, 1927

Order RODENTIA

Family CAPROMYIDAE

Distinguishing characteristics: "Differing from P. aedium in greater size of body ... shorter tail ... smaller scales on tail and feet; narrower feet with longer and sharper claws; pinna of ear less hairy; its margin more thickened and more evenly rounded; color seemingly darker in general, contour hairs with less contrasting tips, cheeks and underparts essentially similar in color to back rather than distinctly paler, a whitish pectoral spot occasionally present." (2:72)

Present distribution: "It seems likely that at the present time ... P. hylaeum is now confined to forested areas in the Samana Bay region of northeastern Dominican Republic." (1:118)

Former distribution: "... this well-distinguished genus is as yet unknown in either fossil or recent state from any other Antillean islands or from the mainland." (1:119)

Status: "Hutias of the genus Plagiodontia are apparently rare in a living state, although their remains are common in cave and kitchen-midden deposits from the island of Hispaniola. Along with Capromys of Cuba and Geocapromys of Jamaica and certain other West Indian islands, they represent a meager remnant of a once-flourishing Antillean fauna of hystricomorph rodents." (2:69)

Estimated numbers: Unknown.

Breeding rate in wild: Of the 13 specimens collected by Dr. W.L. Abbott in 1923 (2:69), four were adult females which "were all pregnant, each containing, in early December, a single young, indicating a slow rate of breeding ..." (1:118)

Reasons for decline: "Slow breeding, being hunted for food, and liability to attack by the mongoose (mainly terrestrial habits) are factors which are hastening its disappearance." (3:28)

Protective measures already taken: "It is protected by law in the Dominican Republic." (3:28)

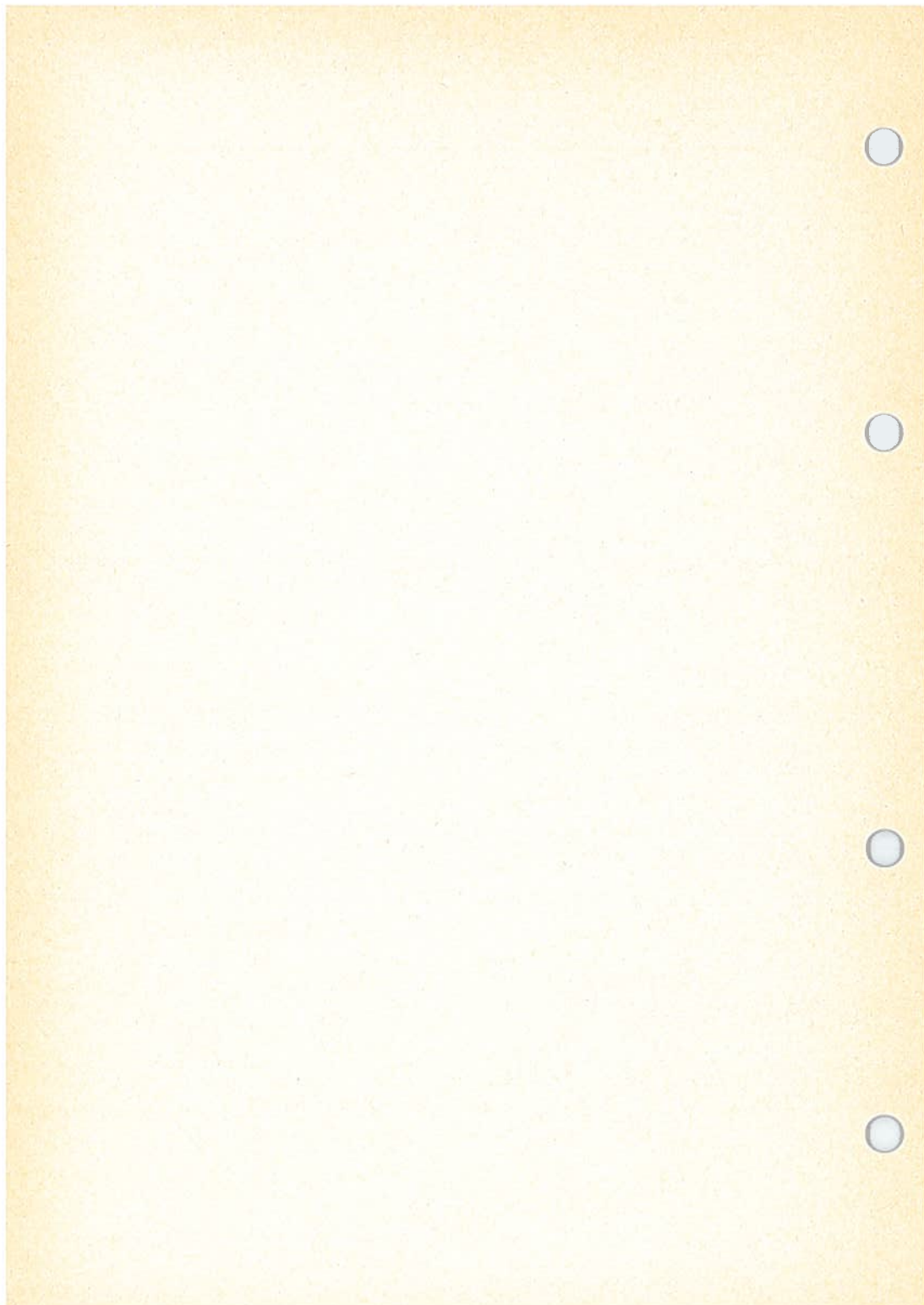
Measures proposed:

Number in captivity:

Breeding potential in captivity:

References:

1. Allen, 1942
2. Johnson, 1948
3. Westermann, 1953



JAMAICAN HUTIA :

Geocapromys brownii brownii (Fischer, 1830)

Order **RODENTIA**

Family **CAPROMYIDAE**

Distinguishing characteristics: The nominate race "is about the size of a cottontail rabbit but more strongly built, with short legs and a stumpy tail. Above, the color is a general dark brown, resulting from abundant parti-colored hairs with dark gray bases and ochraceous tips, mixed with all-black hairs, which are most abundant in the middle of the back. The lower surface is paler, with a buffy-gray throat and lower belly, while the chest and upper part of the belly are more thickly clothed with ochraceous-tipped hairs. The tail and backs of the feet are nearly clear brown. The ears are very short, rounded, and clothed with minute hairs. Total length, 425 mm., tail 50; hind foot, 60." (1:107)

Present distribution: "Known only from Jamaica." (3:795) "Though evidently now much restricted in habitat and abundance ... it nevertheless still occurs in some numbers in the John Crow Mountains at the eastern end of the island where Dr. H.E. Anthony found it in 1919. All his efforts to discover a trace of it in the Blue Mountains, however, were unsuccessful." (1:108)

Former distribution: "This was doubtless a common species on Jamaica in former times and was confined to that island." (1:107)

Status: "The range of *G. brownii* has been so reduced that at the present time these animals survive only in the most inaccessible areas in rugged and rocky regions. In Jamaica they are the only survivors of the indigenous mammals, with the exception of bats." (4:1036) "Still surviving in some numbers in remote mountain areas." (2:42)

Estimated numbers: Unknown.

Breeding rate in wild: "Because of their extreme scarcity today ... little has been recorded concerning their life habits and general biology." (4:1036)

Reasons for decline: "Doubtlessly quite common at one time, *G. brownii* was an important food for the aborigines, for its bones were often found in the ashes of their camp sites. It is said that the natives hunt these hutias with small dogs that wiggle into the animal's hole, grab it, and hold it until pulled out backward, still clutching the hutia. Hutias probably are also preyed upon by the Burmese mongoose, which was introduced on Jamaica in 1872. ... The flesh of *G. brownii* is eaten by island inhabitants." (4:1036)

Protective measures already taken: "Since 1922 it has been accorded full legal protection." (1:109)

Measures proposed: "It would be worth while to restrict, if possible, the hunting of this species in its mountain habitat in order to protect it from extinction for as long as may be." (1:109)

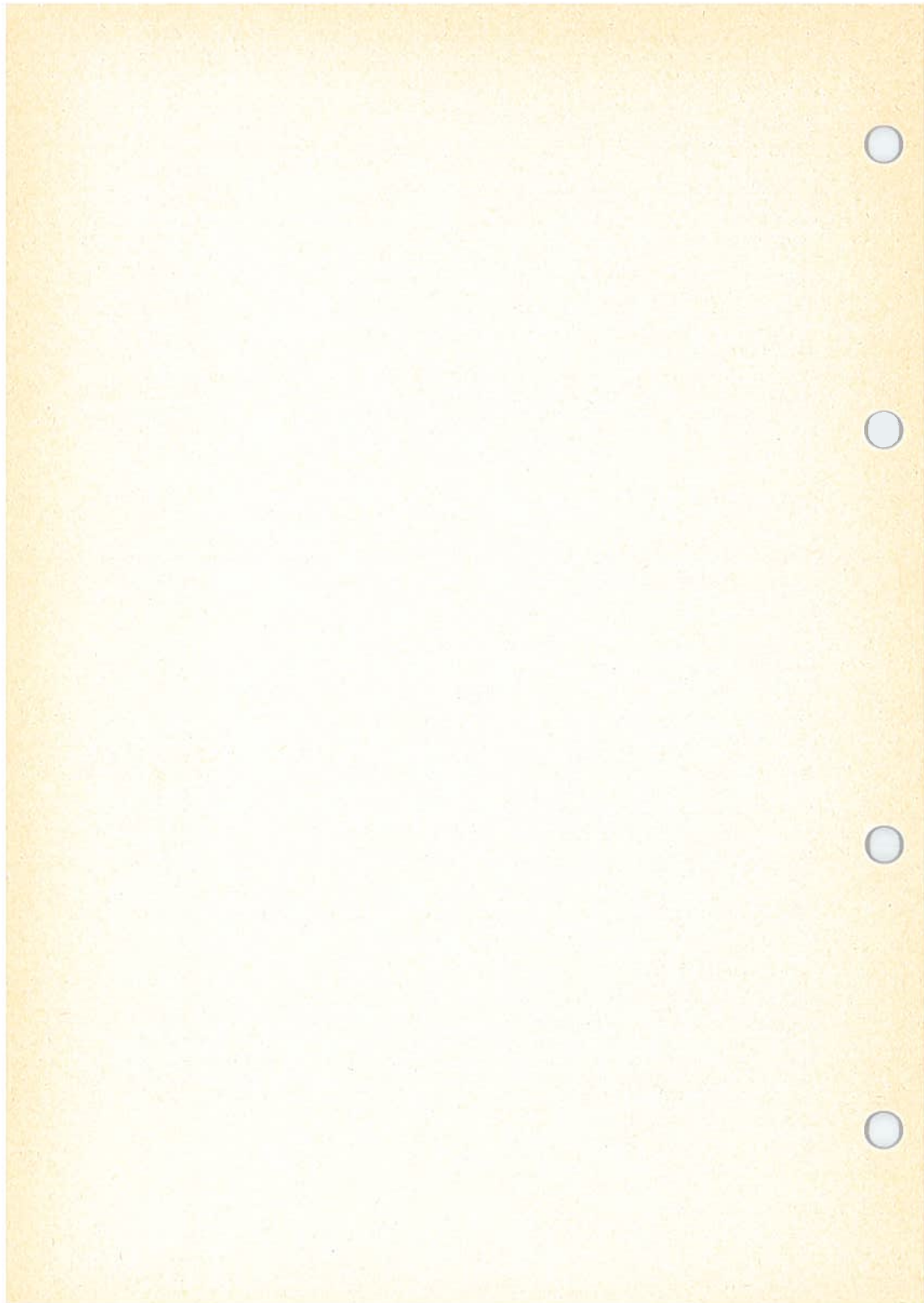
Number in captivity:

Breeding potential in captivity:

Remarks: "These hutias are terrestrial in their habits, they seek retreats under rocks, in hollow trees, or among roots, and are mainly nocturnal. They probably live singly. Their diet is said to consist of grasses, leaves, and shrubs, and probably fruit and fungi." (4:1036) "... the only other living species of this genus occurs on a small islet in the Bahamas ..." (2:42)

References:

1. Allen, 1942
2. Hayman, 1956
3. Hall & Kelson, 1959
4. Walker, 1964



FIN WHALE

Balaenoptera physalus (Linnaeus, 1758)

Order CETACEA

Family BALAENOPTERIDAE

Distinguishing characteristics: The second largest cetacean after the blue whale, occasionally reaching over 80 feet, weighing about 40 - 80 tons and yielding on the average about 80 barrels. (8) "... head less than $\frac{1}{4}$ total length, body light grey above, pure white below, asymmetry of colouring leaves right upper jaw white, underside of both flippers and tail flukes white, dorsal fin high, set well back." (6:266)

Present distribution: Found in both northern and southern hemispheres but the two groups are believed not to mix. (5:139) It is as widely distributed as the blue whale and like that species is not often found in equatorial waters. (1:65) Besides the great oceans it has been recorded in the Mediterranean. (8) There is some evidence to suggest that a majority of individual whales may return to the same area each year to breed. (5:139)

Former distribution: The same.

Status: The most common of the large rorquals and now economically of the greatest significance. Numerically substantially reduced and although less immediately threatened than either the blue or the humpback, stocks are now far below the level required to sustain maximum yields. (7:30)

Estimated numbers: The decline of the fin whale is shown by statistics of average population size provided by the International Whaling Commission: 1955/56 - 110,400; 1956/57 - 101,700; 1957/58 - 89,000; 1958/59 - 88,600; 1959/60 - 65,700; 1960/61 - 59,700; 1961/62 - 45,300; 1962/63 - 40,000; 1963/64 - 32,400.

Breeding rate in wild: Gestation period about 11 months; size at birth about 21 feet; calf suckled for about 7 months; maturity reached at about 17 months. Single calves are the general rule but multiple births have been recorded, including sextuplets. (3:50-51)

Reasons for decline: Before 1904 modern whaling was almost entirely restricted to the northern hemisphere and the southern hemisphere populations were free from exploitation on the antarctic feeding grounds. (2:374) Improvement in the efficiency of modern whaling methods during the last 30 - 40 years has resulted in a complete reversal of this situation, and today 60% of the total world catch comes from the Antarctic. The fin whale now furnishes the bulk of the antarctic catch. (4:400) In the 1961/62 season it provided 95.9% of the combined catch of blue and fin whales, the highest percentage so far recorded. Of the 27,176 rorquals (blue, fin, sei) taken during the 1955/56 season, 25,289 were fins; 25,837 were killed during the 1958/59 season; 26,438 in 1961/62 and 18,668 in 1962/63.

Protective measures already taken: Females with calves are fully protected; no fin whale smaller than 57 feet may be taken in the Antarctic, and this protects most of the immatures. By means of the 'Blue Whale Unit' formula (1 blue = 2 fins = 2 humpbacks = 6 sei) the catch can be limited without the necessity of any distinction between species. (5:138-139)

Measures proposed: The decline of the blue whale resulted in the fin assuming first place as the most important commercial species and its extinction would result in the disruption of the greater part of the whaling industry. (5:142) For this reason it is very much in the interests of the industry to ensure the continuance of the species. The regulations introduced by the International Whaling Commission are designed for this purpose but they depend on voluntary acceptance by all governments whose nationals take part in antarctic pelagic whaling, and have not so far proved effective in preventing excessive exploitation.

Number in captivity: None.

Breeding potential in captivity: Unknown.

- References:
1. Mackintosh, 1946
 2. Ruud, 1956
 3. Budker, 1958
 4. Mackintosh, 1959
 5. Laws, 1962
 6. Burton, 1962
 7. International Whaling Commission, 1965
 8. N.A. Mackintosh in litt. 31/10/63

BLUE WHALE

Balaenoptera musculus musculus (Linnaeus, 1758)

Order CETACEA

Family BALAENOPTERIDAE

Distinguishing characteristics: "Length 100', girth 45', 119 tons wt., head less than $\frac{1}{4}$ total length, flipper 15' long, 80 - 100 grooves on throat, 20 - 40 hairs ("beard") on anterior part of head, colour dark slate-blue except on tip of underside of flippers, body may be mottled and underside may be yellow from growth of diatoms, baleen black, width of tail flukes 21', dorsal fin small, placed far back." (5:265)

Present distribution: The Antarctic Ocean ranging north into tropical seas. Small numbers occur in the northern hemisphere. (2:65) From late winter to early summer there is a movement into antarctic waters where there is a profusion of the pelagic shrimp Euphausia superba, known as 'krill', which is the animal's staple food, and the return migration begins in late summer when it moves north to warmer waters to breed and bear young. (1:47-49)

Former distribution: "A hundred years ago they could be encountered in all seven seas but they were most plentiful in cold and temperate waters in the north and the south." (8)

Status: Greatly reduced during the past 30 years and now probably the most gravely endangered of all the large whales. An indication of its status can be gained from the fact that the percentage of blue whales in the catches of the Antarctic whaling fleets has steadily declined from 82.1% in the 1931-32 season to less than 5% in recent years. This statistical decline can of course be partially attributed to the restrictions on hunting that have been imposed by the International Whaling Commission. (7) The suggestion has been made that numbers are now so low and the animal is so widely dispersed across its vast natural range that breeding may be inhibited. (4:150) Although there is no firm evidence to support this hypothesis the Supplementary Report of the Committee of Three Scientists (p.15) states: "Thus when the stock is below a certain critical size, the reproductive rate itself may be reduced and in such circumstances the stock cannot sustain itself. The stock level at which this can be expected to occur in any whale species is not known but we cannot rule out the possibility that the blue whale is already beyond recovery."

Estimated numbers: Mackintosh (1942) estimated that in the 1930's blue whales constituted about 15% of the three principal antarctic species and according to the later estimates of Mackintosh and Brown (1956) this would give a blue whale population of the order of 30 - 40,000 at that time, though it was already diminishing. (7) An assessment in the Supplementary Report of the Committee of Three Scientists estimates that (omitting pygmy blue whales, of which only about 2 - 3,000 exist) the 1961/62 stocks totalled between 930 and 2,790. Their final Report (para. 71) estimates that by 1963 the stock will have been reduced to between 650 and 1,950 blue whales. (6:43)

Breeding rate in wild: The gestation period is nearly 11 months and the calf, which is about 23 feet long at birth, is believed to be suckled for about 7 months, the mother's milk being exceptionally rich in fats. A calf is reputed to consume more than half a ton of milk a day. (1:50) The normal interval between births is probably two years, but there is evidence that reduction of the stock was accompanied by a limited increase in the birth rate through contraction of the mean interval between births. (3:150)

Reasons for decline: Over-exploitation of the species for commercial purposes. The blue whale is particularly attractive commercially since it can yield about 140 barrels of oil, often taken as the equivalent of two fin whales. Although whales have been hunted for many hundreds of years, only recently has man been able to kill the largest cetaceans. The decline of the blue whale dates from the invention of the harpoon gun and steam catcher in the 1860's which revolutionised the industry. (4:150) More recently, the development of pelagic factory ships and various technical aids have further improved the efficiency of whaling. "In the peak season of Antarctic whaling, in 1930-1931, some 29 thousand blue whales were killed, and the total number killed during the 60 years which have passed since whaling in the Antarctic began amounts to about 340,000 blue whales." (8)

Protective measures already taken: Since the war of 1939-1945 the total Antarctic catch of baleen whales has been restricted by international agreement to an amount substantially below the pre-war average; moreover a reserve, by far the largest in the world, between 70°W and 160°W and south of 40°S, was closed to all whaling, though it was not retained after 1955 since it appeared unnecessary so long as the total catch limit was held. From 1953 the catching of blue whales was separately restricted to the later part of the Antarctic season and from 1960 the species has received virtually total protection in the North Atlantic. It became clear, however, that the principal (southern) stocks of blue whales continued to decline and in recent years the scientific committees of the International Whaling Commission have advised total protection. This was strongly reinforced in 1963 by the more advanced stock assessments of the Committee of Three Scientists appointed by the Commission, and at their 15th Meeting in that year the Commission agreed to prohibit the catching of blue whales in the Antarctic south of latitude 40°S, except for the area between 40 - 55° South Latitude and 0 - 80° East Longitude which is mainly inhabited by the pygmy blue whale. (7)

Measures proposed: A complete cessation of the catching of blue whales is necessary if the animal is to survive. "The last resort of importance to blue whales now open to hunting is in the North Pacific. There they are mainly caught by Japanese expeditions, which are under control of regulations imposed by the Japanese Government. Under present rules the taking of blue whales from Japanese expeditions may not exceed 70 per year. This protection may or may not be sufficient to maintain a stock in balance with the annual taxation." (8)

Number in captivity: None.

Breeding potential in captivity: Unknown.

Remarks: The mean length at sexual maturity is close to 74 feet for males and 78 feet for females. Corresponding lengths at full growth are about 79 and 86 feet, but there is appreciable variance. The maximum length may be about 100 feet and weight perhaps 160 tons, though greater lengths and weights have been reported. Estimates of the age at maturity and the life span are unreliable until the problem of absolute age determination has been solved. (7)

- References:
1. Budker, 1958
 2. Mackintosh, 1959
 3. Laws, 1962
 4. Engel, 1962
 5. Burton, 1962
 6. Anon., 1963
 7. N.A. Mackintosh in litt. 31/10/63
 8. J.T. Ruud in litt. 17/3/64

PYGMY BLUE WHALE

Balaenoptera musculus brevicauda Zemsky & Boronin, 1964

Order CETACEA

Family BALAENOPTERIDAE

Distinguishing characteristics: "In animals of all ages, the body colour is silvery grey, rather than the steel blue of ordinary blue whales. Numerous white scars are present in posterior region of the body of pygmy blue whales over about 70 feet in length. ... Although the mean length at sexual maturity is not yet known with any accuracy, there is some evidence that it is probably under 65 feet for both sexes. ... The pygmy blue whale has a much shorter tail and hence considerably longer trunk than the ordinary blue whale, ..." (1:129)

Present distribution: The principal known habitat is in the southern Indian Ocean. "... pigmy blue whales were captured mainly in the waters around Marion Island (about 47°S, 38°E), Crozet Island (about 46°S, 51°E) and Kerguelen Island (about 49°S, 70°E). Thus, [the subspecies] appears to inhabit the area between 30° and 80°E. and north of 52°S." (1:128) Examples have been identified in the catches of whales in South Africa (2:66) and Australia. (5) Possibly it may be more widely distributed. The suggestion has been made that pygmies do not undertake such extensive seasonal migrations as other blue whales. (5)

Former distribution: Not known to differ from present distribution. (5)

Status: Pygmy blue whales had not been recognized as distinct from other blue whales until biological observations were made on those caught by Japanese whalers in recent years in the vicinity of Kerguelen Island. (4:306-311) There is not much material yet for an assessment of the conditions of the stock, but it appears to be a small one (3:145) and the Committee of Three (now Four) reporting to the Commission, believe that the subspecies cannot sustain an annual catch of more than 300 - 400 and that the figure might in fact be less than half as much. (5)

Estimated numbers: It has been roughly estimated that the original population was about 4,000 and was reduced to 2-3,000 by 1963. (5)

Breeding rate in wild: Probably not much different from that of other rorquals. (5)

Reasons for decline: The reduction of the stocks of larger baleen whales in the Antarctic has no doubt caused the whalers to pay more attention to smaller and less valuable whales, including the sei and pygmy blue. (5)

Protective measures already taken: Catching is limited to the open season in the Antarctic and to the legal minimum length of 70 ft., but the prohibition on the taking of blue whales in general is qualified by permission to take them in the waters between 0° and 80° East longitude, and north of 55°S. This is the principal known habitat of the pygmies which thus have little effective protection. (5)

Measures proposed: Complete protection. The sustainable yield from the existing stock is very small, and the catching now permitted, though in a restricted area, allows for the taking of some of the large blue whales, the stocks of which are at a dangerously low level. (5)

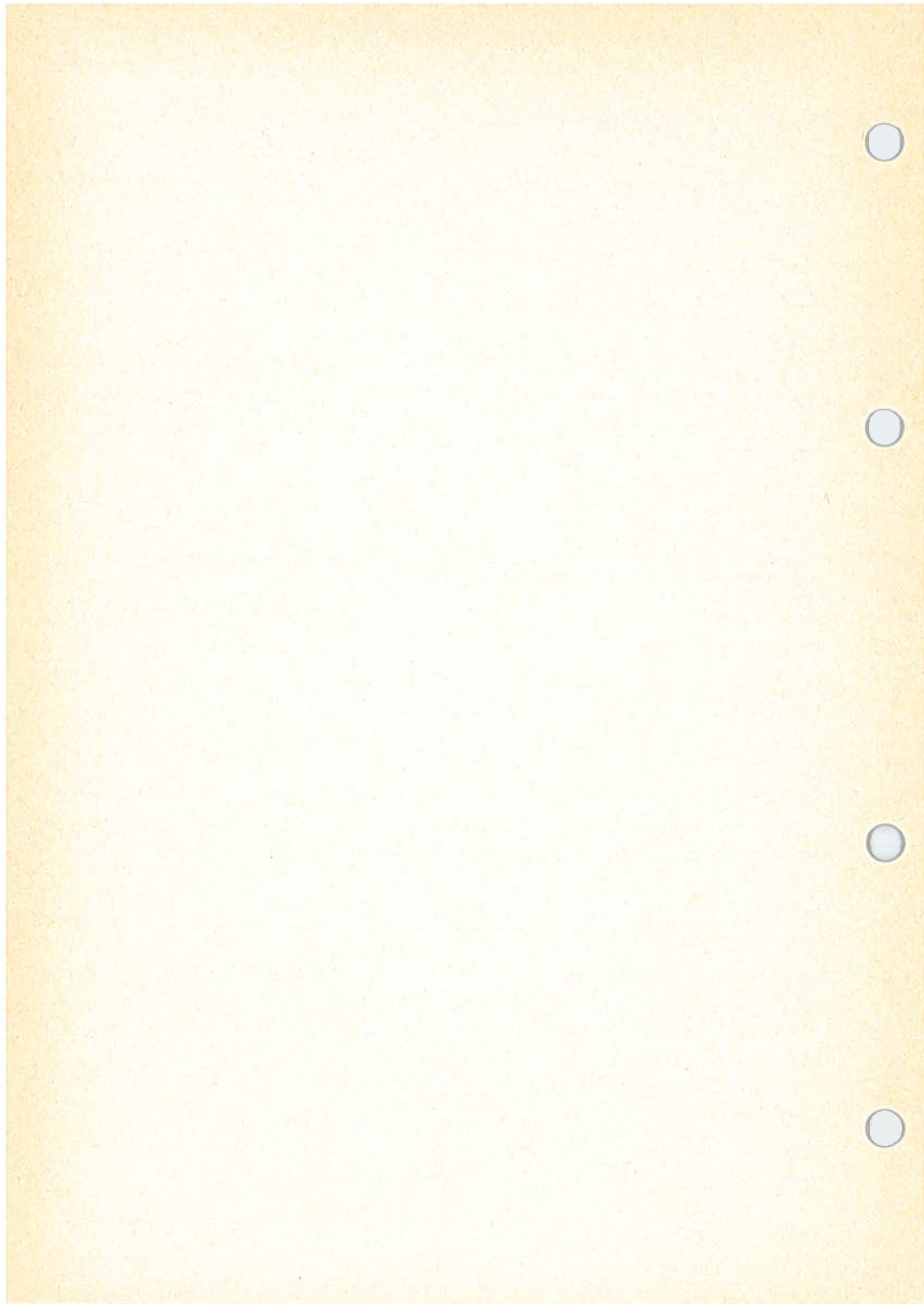
Number in captivity: None.

Breeding potential in captivity: Unknown.

- References:
1. Ichihara, 1963
 2. Gambell, 1964
 3. Ichihara & Doi, 1964
 4. Zemsky & Boronin, 1964
 5. N.A. Mackintosh in litt. 17/2/65

Status category: 2(b)**

Code number: MA/94/BALAE/MUS/BRE



HUMPBACK WHALE

Megaptera novaeangliae (Borowski, 1781)

Order CETACEA

Family BALAENOPTERIDAE

Distinguishing characteristics: "Length 50' (average 45'), head about $\frac{1}{3}$ total length, flipper 14' or more long, scalloped on front margin, grooves on throat 14 to 20 or more, numerous tubercles on head, each bearing 1 - 2 bristles, black on back, lighter underneath with much white, flipper white underneath, black or parti-coloured above, baleen grey-black, dorsal fin small, midway between head and tail." (6:267)

Present distribution: Occurs from the Arctic to the Antarctic Oceans. Its migrations conform to a regular pattern. On the approach of winter it moves from the feeding grounds in cold waters into warmer latitudes for breeding, being frequently found along the coasts of East and West Africa and Australia. "There is convincing evidence ... that the southern stocks consist of several - probably five - populations, separated at both ends of their migration routes, between which there can be little interchange of individuals." (5:399) In the north, its migrations "are similar to those in the southern hemisphere." (2:65)

Former distribution: The same. "The information given by Harmer (1928), Townsend (1935) and the International Statistics shows that in the northern hemisphere humpbacks have been found from the Cape Verde Islands to Spitzbergen, from the West Indies to Baffin Bay, from Mexico to the Bering Sea, and from the Mariana Islands (15-20° N.) to Kamchatka." (2:65)

Status: "Increasing in the North Atlantic; rare and rapidly declining in the North Pacific; very rare in the Southern Hemisphere. ... Large numbers killed in the North Pacific each year; 2,339 were killed in 1963." (9:56)

Reasons for decline: "Unlike blue and fin whales they congregate in winter in the tropical coastal waters of the southern continents, and they are exposed to hunting then as well as in the Antarctic in summer. Moreover they are smaller, fatter, slower, and more gregarious than the blue and fin whales. Thus the humpback is a species which is very easily depleted ..." (5:399) Of secondary interest to the old-times whalers it has been attractive to the modern whalers because of the ease with which it could be taken with the steam catcher and harpoon gun. (5:399) Severe exploitation of the humpback did not take place until the commencement of the modern whaling industry in the south (circa 1905). It then came to be regarded as the most important commercial species and was very heavily hunted in preference to other whales. Over-exploitation caused numbers to decline rapidly. (1:68-69)

Estimated numbers: Studies indicate that in the 1930's there may have been a population of the order of 22,000 humpbacks in antarctic waters. (Mackintosh and Brown, 1956). (7:47) The position in 1965 was reported to be: "North Atlantic - no estimate, but fairly numerous on the western side; North Pacific - probably fewer than 5,000; Southern Hemisphere - probably fewer than 3,000." (9:56)

Breeding rate in wild: The gestation period is almost 12 months and the calf is about 14-16 feet long at birth. The calf is suckled for 5½ months, maturity is reached in 15 - 17 months and full growth in about 10 years. (4:50) Since births occur in tropical waters it is possible that sharks may cause mortality among calves but there is no precise information on this point. Killer whales which are found from the Arctic to the Antarctic, may also inflict casualties. (4:77)

Protective measures already taken: The capture of humpbacks in the Antarctic was entirely prohibited in 1938 and not resumed until 1949, and then only on a limited scale. (3:381) Since 1956 the hunting of this animal has been forbidden in Area II of the Antarctic (i.e. between 0° and 60°W) and elsewhere the hunting season has been restricted to a few days in each year. (3:384) No humpback smaller than 35 feet may be taken. (3:380) In June 1963 the International Whaling Commission agreed to a complete cessation of hunting of humpbacks in waters south of the Equator. It is intended that this prohibition will remain in force for a considerable number of years in order to allow stocks to increase to the maximum sustainable yield. (7:3)

Measures proposed: "Continuation of complete protection in North Atlantic and Southern Hemisphere until stocks increase; further studies on North Pacific stocks to determine sustainable yield." (9:56)

Number in captivity: None.

Breeding potential in captivity: Unknown.

- References:
1. Harmer, 1928
 2. Mackintosh, 1946
 3. Ruud, 1956
 4. Budker, 1958
 5. Mackintosh, 1959
 6. Burton, 1962
 7. Anon., 1963
 8. International Whaling Commission, 1965
 9. Kenyon et al., 1965

GREENLAND RIGHT WHALE

Balaena mysticetus Linnaeus, 1758

Order CETACEA

Family BALAENIDAE

Distinguishing characteristics: "Length 50', head nearly $\frac{1}{3}$ total length, no grooves on throat, colour black, with white area on chin, baleen black, width of tail flukes 26', no dorsal fin." (4:267)

Present distribution: "More polar in its occurrence than any other of the great whales." (1:56) Rarely observed, but occasional examples are regularly taken by Eskimos of north Alaska. (6:50) There is some evidence that it survives also in arctic waters north of Europe. (5:311)

Former distribution: Unlike the other Balaenidae, the Greenland right whale does not migrate to other regions but remains constantly in arctic waters, except for seasonal movements related to the advance and retreat of the ice edge. Occurred in large numbers in the vicinity of Spitzbergen, Jan Mayen Island, Davis Strait, and Baffin Bay and to a lesser extent in Hudson Bay, and may have penetrated as far south as Newfoundland. In the North Pacific it occurred in the Sea of Okhotsk, the northern part of the Bering Sea, in the Arctic Ocean north of the Bering Strait and extending along the northern coast of Alaska and Canada. (2:62)

Status: Although it was formerly abundant in the Arctic it had been hunted almost to extinction by the end of the nineteenth century. One was taken near Spitzbergen in 1911, two in the N.E. Pacific in 1923 and 25 in 1924 (Int. Whaling Statistics 1930; 1931): four more were taken near Spitzbergen in 1932. (2:62) "Increasing in the Bering-Chukchi-Beaufort Sea area, and in eastern Canadian Arctic; nearly extinct between East Greenland and the Barents Sea (one sighted in latter area in 1963); status of Okhotsk Sea stock unknown." (6:50)

Estimated numbers: "Roughly on the order of 1,000 in the Bering-Chukchi-Beaufort Sea stock; size of other stocks unknown, but probably smaller." (6:50)

Breeding rate in wild: "... seemingly mate in late summer; have 1 young (two were seen with 1 female) after a gestation period of about $9\frac{1}{2}$ months ..." (3:840)

Reasons for decline: The hunting of this species in the Arctic was no doubt a natural development from the depletion of the North Atlantic right whale (q.v.) and competition between European whaling interests. The ease with which it can be captured, its gregarious habits, and the value of its oil and baleen have all contributed to its near-extinction. (7) At one time it was possible for a small vessel "to cover its expenses for an entire season out of the proceeds of a single whale", and this was largely due to the value of the baleen. (1:57)

Protective measures already taken: Fully protected and all hunting forbidden except locally by aborigines. (7)

Measures proposed: "Present harvesting methods are inefficient and wasteful. In some localities up to $\frac{2}{3}$ of potential products are wasted ... Methods for the taking of these whales and extent of utilization of the carcasses should be defined. More efficient guns should be introduced to the Eskimos to prevent loss of wounded whales." (6:50)

Number in captivity: None.

Breeding potential in captivity: Unknown.

- References:
1. Harmer, 1928
 2. Mackintosh, 1946
 3. Hall & Kelson, 1959
 4. Burton, 1962
 5. Jongsard, 1964
 6. Kenyon et al., 1965
 7. N.A. Mackintosh in litt. 26/10/64

NORTH ATLANTIC RIGHT WHALE

Eubalaena glacialis (Borowski, 1781)

Order CETACEA

Family BALAENIDAE

Distinguishing characteristics: "Total length to 70 ft. Blackish throughout except for whitish bellies in some individuals. Length of skull approximately $\frac{1}{4}$ of total length; skull arched more at base than at rostrum when viewed from side; depth of skull from most dorsal point on rostrum to most ventral point on mandible less than greatest depth of thorax; horny excrescence or 'bonnet' on anterodorsal portion of head; plates of baleen numerous (at least 250), approximately 8 ft. long, blackish, central plates longest." (3:839)

Present distribution: Since hunting is prohibited it is hard to obtain information on this and other protected species. Probably not different from former range in temperate North Atlantic, but few sightings are reported except in North American waters. (6) "It is a well-known fact that the Nordkaper does not migrate so far north as the Greenland Right Whale ... Collett (1912) writes that its northern limit coincides approximately with the southern limit of the Greenland Right Whale ..." (4:312)

Former distribution: From the 12th century or earlier it was taken in winter in the Bay of Biscay. (1:53) Hunting spread later to the west side of the North Atlantic and N.W. European waters as far as the north of Norway and Iceland. There is evidence of a movement towards cold latitudes in summer and warm latitudes in winter, but the species does not normally enter the tropics or the coldest Arctic waters. It is probably an inhabitant of deep waters, but it is not clear whether it extends freely over the open ocean. (2:502)

Status: One of the three black right whales (Eubalaena) which are scarcely distinguishable but live in separate regions. Now scarce but not as severely reduced as the Greenland right whale. Unpublished reports of sightings in the N.W. Atlantic suggest that its numbers are now slowly increasing. (6)

Estimated numbers: "Unknown, probably only a few hundred in the world." (5:48)

Breeding rate in wild: "Females bear a single calf, which is nursed for approximately a year." (3:839)

Reasons for decline: Its accessibility in temperate water, the great yield of oil, relatively slow swimming speed, and the buoyancy of the carcass, combined to make it an easy and profitable quarry. It was the first of the large species to be the subject of a substantial industry, and was reduced to negligible numbers by the beginning of the 18th century in European waters, and 19th century in American waters. (6) According to Harmer (1928) it had become excessively rare and was believed to be extinct, but reappeared in small numbers from 1850 onwards in American and European waters. (1:55)

Protective measures already taken: "Completely protected from commercial exploitation since 1937 by the International Convention for the Regulation of Whaling." (5:48)

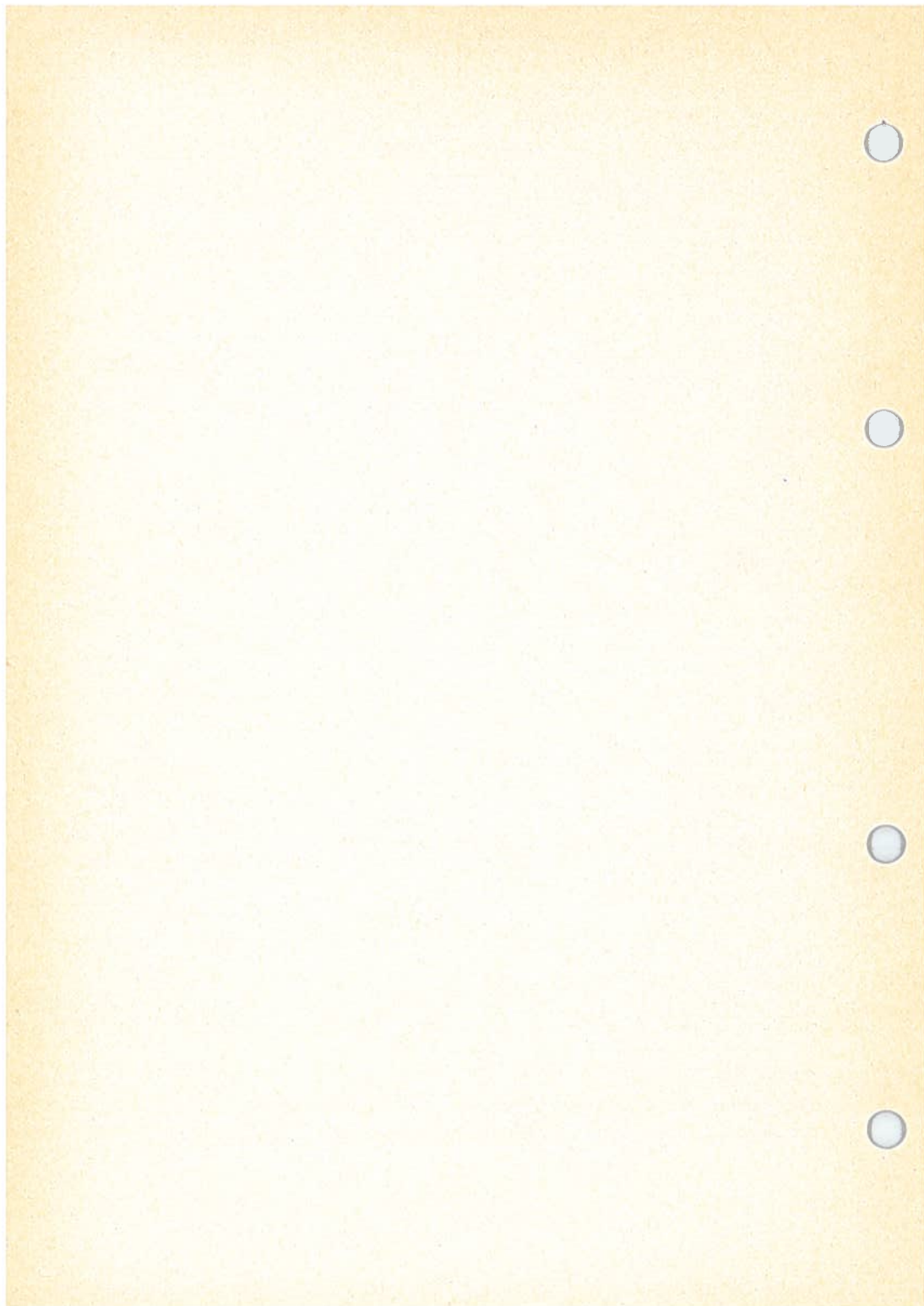
Measures proposed: "Continuation of complete legal protection, and placing of international observers on all whaling factory ships, to ensure that the prohibition is enforced." (5:49)

Number in captivity: None.

Breeding potential in captivity: Unknown.

References:

1. Harmer, 1928	4. Jonsgard, 1964
2. Allen, 1942	5. Kenyon et al., 1965
3. Hall & Kelson, 1959	6. N.A. Mackintosh in litt. 26/10/64



NORTH PACIFIC RIGHT WHALE

Eubalaena sieboldii (Gray, 1864)

Order CETACEA

Family BALAENIDAE

Distinguishing characteristics: "... differs from E. glacialis only in greater total length, proportionally smaller 'bonnet' and Pacific, rather than Atlantic, distribution." (5:840)

Present distribution: Not essentially different from former distribution. "Japan, Kamtchatka, northwestern North America." (3:718) The North American range is given as "Pacific. Alaska: Aleutian Islands, thence southwards to Baja California." (5:840) Omura records sightings and catches in the N.W. Pacific as far south as the Bonin Islands in winter. (4)

Former distribution: Charts by Townsend of the location of catches from 1785 onwards show that it was mainly found between 40° and 60° N., especially in the Sea of Japan, around the Kurile Is. and Kamtchatka, and in the Gulf of Alaska, but winter catches extended as far south as Formosa (24° N.). (1:8) That it moves from temperate or cold waters in summer to warmer latitudes in winter is confirmed by Scammon, who gives their chief resort as the 'Kodiak Ground', extending from Vancouver I. to the Aleutian chain, but refers to winter catches on the American side as far south as 29° N. (6) (See also 2:503)

Status: "Now very rare." (3:718) Omura records 227 sightings by Japanese whalers between 1941 and 1957, (4) but it is certainly a scarce whale and it is not known whether any recovery has begun. (6)

Estimated numbers: There is no basis for a realistic estimate, but present numbers must be small. (6) Allen quotes records of catches indicating a total of 35 in a grand total of 17,862 whales (or 0.002%) taken at Japanese stations from 1910 to 1920, (2:504) and Omura gives 66 between 1925 and 1934. (4)

Breeding rate in wild: "Females normally give birth to a single calf, occasionally twins." (5:840) "As with other large whales there is normally but a single young one at birth. According to Millais, the northern right whale bears a young one every two years, and suckles it for 12 months, but precise information on these matters is still a desideratum." (2:506)

Reasons for decline: "Scammon states that the average yield of oil of the North Pacific right whale is 130 barrels, but in earlier days individuals of large size might give twice that amount. So vigorous was the hunting for this species in the early half of the last century that according to Bolau, between 1846 and 1851 there were 300 or 400 whaling ships engaged in its pursuit on the Kodiak grounds from April to September. At that time, too, the use of the bomb lance had just come in, and its deadly effect was that the right whale was soon practically exterminated from these waters." (2:503-504) Like the North Atlantic right whale it is easily taken and accessible from the shores of any country adjacent to its habitat. Moreover there were centuries of experience in hunting the black right whales (Eubalaena), first by the Basques in the Bay of Biscay, then in other parts of the North Atlantic, and so in time in the North Pacific. (6)

Protective measures already taken: Protected by international agreement during the past 30 years. (6)

Measures proposed: Continuation of total protection. (6)

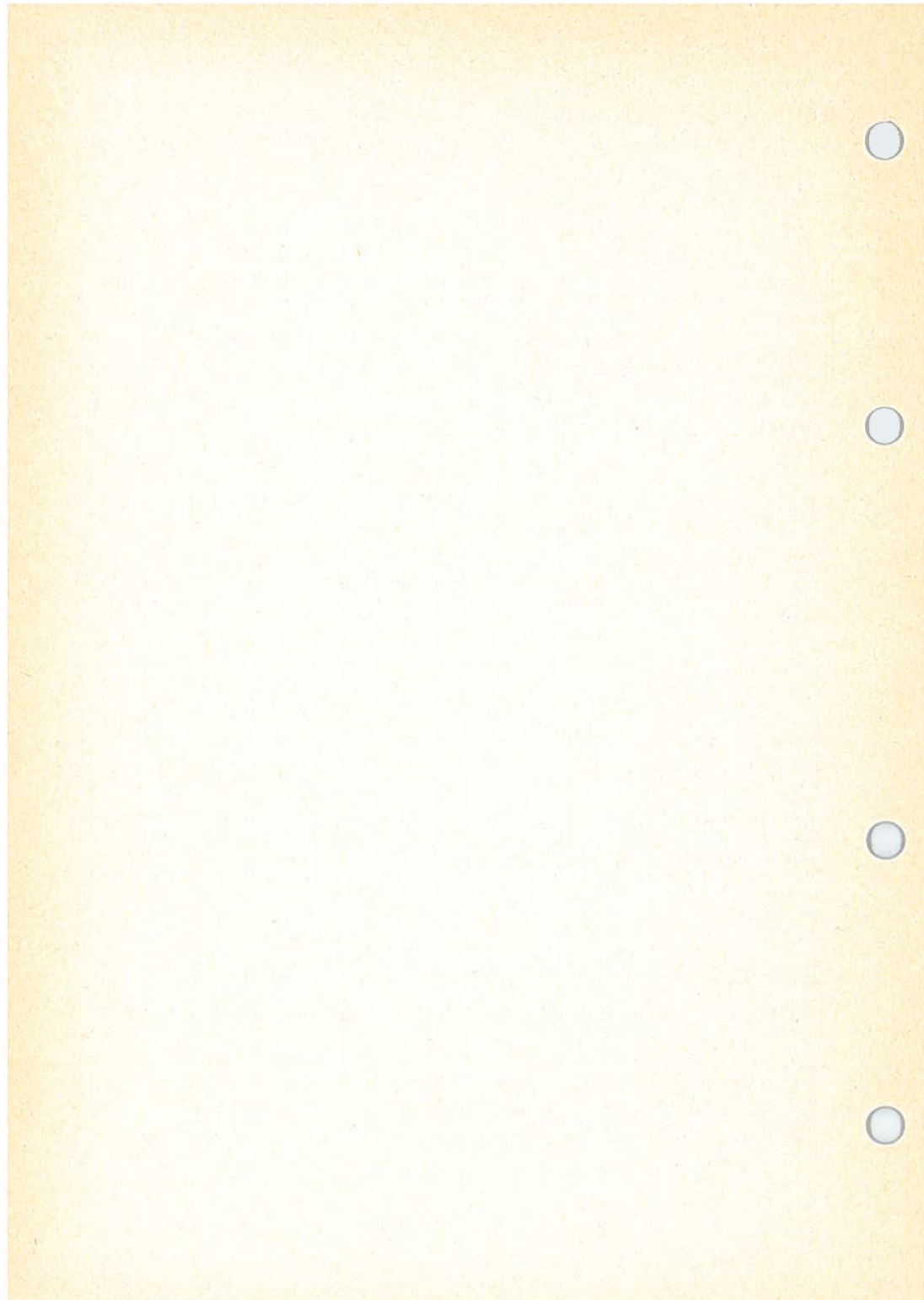
Number in captivity: None.

Breeding potential in captivity: Unknown.

- References:
- | | |
|------------------------------------|---|
| 1. Townsend, 1935 | 4. Omura, 1958 |
| 2. Allen, 1942 | 5. Hall & Kelson, 1959 |
| 3. Ellerman & Morrison-Scott, 1951 | 6. N.A. Mackintosh
in litt. 26/10/64 |

Status category: 3(a)**P

Code number: MA/95/EUBAL/SIE



SOUTHERN RIGHT WHALE

Eubalaena australis (Desmoulins, 1822)

Order CETACEA

Family BALAENIDAE

Distinguishing characteristics: "... up to 60' long, similar to Greenland Right Whale but head shorter, baleen shorter, lower jaws less deep, without white chin patch, usually horny lump (or 'bonnet') on snout ..." (3:267)

Present distribution: Probably not different from former distribution though sightings in recent years are mainly in the Atlantic between 35° and 55°S. (5) "On 27 August 1964 I was able to observe a cow and calf of the southern right whale near the beach called Playa Grande at Cartagena in 33° 32'S, 71° 37'W, which is the most northerly record in the present century." (4:121)

Former distribution: "... It was found in large numbers in the southern oceans mainly between latitudes 30° and 60°S. It was particularly numerous in coastal waters of the southern part of the African and American continents, Australia and New Zealand." (2:504) Charts by Townsend show catches in almost all longitudes between 30° and 50°S., though very few in the Pacific between 90° and 140°W. Off the west African coast it was taken as far north as 20°S. in winter. (1:9) "It was formerly abundant off the coasts of Chile and the Argentine and over the extent of the Patagonian Shelf, but these stocks, like those in other temperate latitudes of the southern hemisphere, were devastated by whaling in the nineteenth century." (4:124)

Status: Allen (1942) stated: "... it is clear that the former abundance ... has already been reduced to well beyond the danger point ... Whether the species will ever recuperate sufficiently to become commercially important again seems at present doubtful." (2:505) "[Off the coast of Chile] a total of 174 (or 166) right whales have been captured between 1908 and 1963, that is, an average of about three a year, although the captures have been sporadic, and in the 24 years after 1934 only nine have been recorded." (4:126) "There are indications that in other parts of the southern ocean the right whale is beginning to appear again in places where it has not been seen for many years. In 1955 a cow and calf were observed on the west coast of Australia (Chittleborough, 1956) and in 1963 five were seen in New Zealand waters (Gaskin, 1964). According to Elliott (1953) right whales have become increasingly numerous around Tristan da Cunha in the South Atlantic." Also increasing around South Georgia (Clarke & Ruud, 1954). (4:127-128)

Estimated numbers: Unknown.

Breeding rate in wild: Probably a single young every two years. The calf is suckled for about 12 months. (2:506)

Reasons for decline: Like the black right whales of the North Atlantic and North Pacific it is an easy and profitable species to catch. "It was the subject of a large fishery which, by the destruction of the females and young on the breeding grounds, reduced the numbers of the species to so low an ebb that its capture was abandoned. According to Harmer (1928), 193,522 Southern Right Whales were captured from 1804 to 1817, an average of 13,822 annually." (2:504) "Referring to the fishery in other parts of the

southern seas, Bennett (1840) and Dieffenbach (1843) were already calling attention to the special vulnerability of the right whale stock due to the habit of the females to come close inshore in winter to calve and nurse their young, just as the cow and calf were to be found in Cartagena Bay in August 1964. As in South Africa, New Zealand and Australia, so in Chile the early decline of right whaling must have been largely the result of the wholesale slaughter of females and their calves in bays and inlets during the first three of four decades of the nineteenth century." (4:124)

Protective measures already taken: International regulations have prohibited the taking of this species since 1935. (5)

Measures proposed: Continuation and enforcement of protection. (5)

Number in captivity: None.

Breeding potential in captivity: Unknown.

References:

1. Townsend, 1935
2. Allen, 1942
3. Burton, 1962
4. Clark, 1965
5. N.A. Mackintosh in litt. 26/10/64

MANED WOLF

Chrysocyon brachyurus (Illiger, 1811)

Order CARNIVORA

Family CANIDAE

Distinguishing characteristics: "... like giant fox on stilts, shaggy reddish coat, fox-like head, large erect ears, 51" head and body, tail 16" long, extraordinarily long legs for size of body." (3:148)

Present distribution: "Interior of Brazil from the state of Piauí as far as Rio Grande del Sul and Mato Grosso, possibly extending to the eastern extremity of Bolivia, thence to Paraguay and northeastern Argentina. This area of distribution appears to be limited to the north by the Parnaíba River as far as the northern Argentine province of Corrientes, Santiago del Estero." (2:240)

Former distribution: "Azara has already stated in his 'Apuntamientos' that this species did not exist in his time south of Rio de Plata and in the interior of Uruguay: it existed in former times and disappeared in the 19th century." (2:240)

Status: "Gravely endangered." (6) "... little is known of their habits in the wild." (4:1163)

Estimated numbers: Unknown.

Breeding rate in wild: "The number of young is usually two and the pups are generally born in the winter. A litter of three was born at the San Diego Zoo." (4:1163)

Reasons for decline: "In open country it is simple for a horseman to ride them down until they are exhausted and then to lasso them." (6) "Some South Americans make a 'tea' from bone shavings of the maned wolf. This concoction is given to pregnant women and is said to ease delivery." (4:1163)

Protective measures already taken:

Measures proposed:

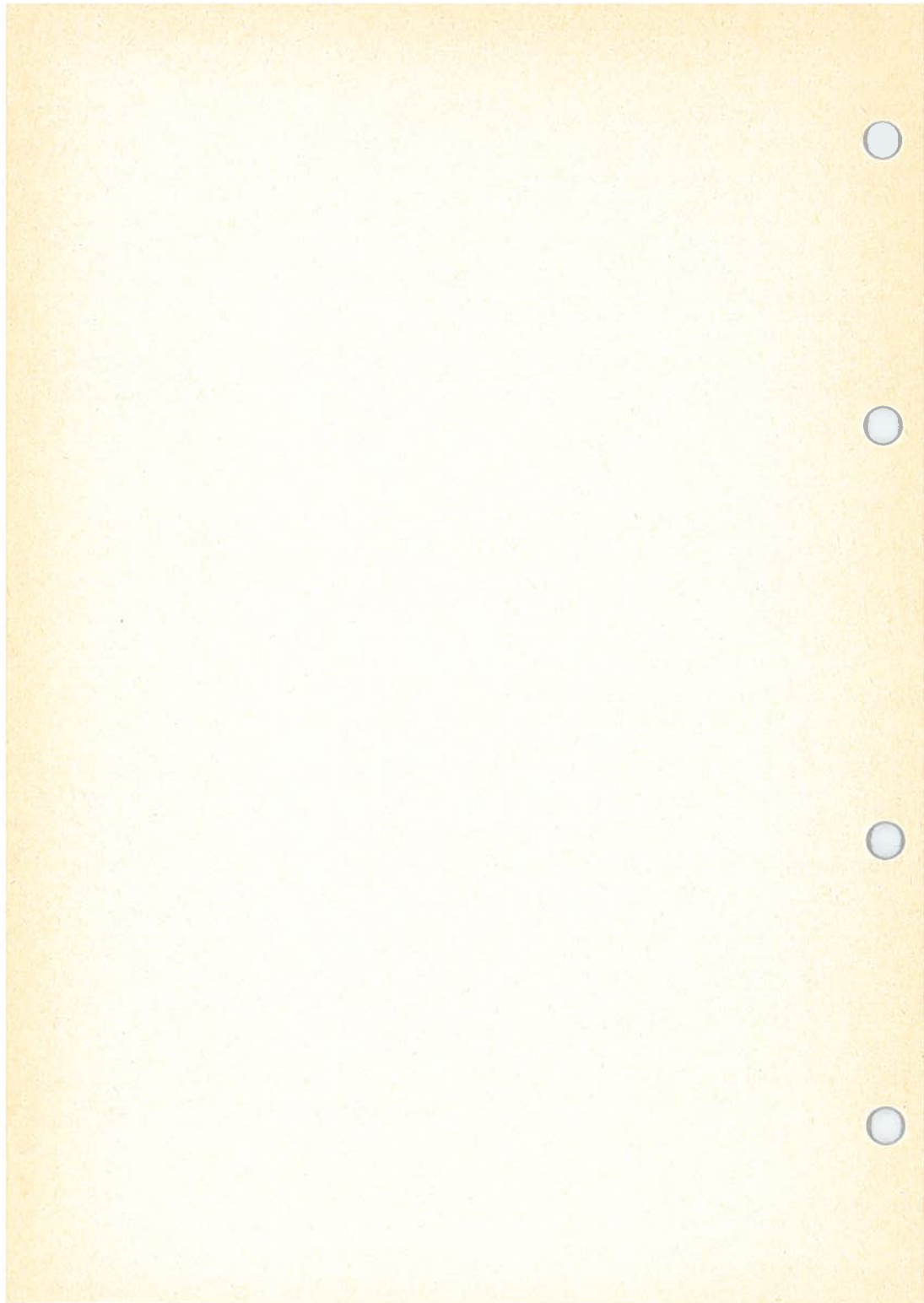
Number in captivity: 8 ♂♂, 10 ♀♀ in 10 zoos. (5:378) Plus a pair at the Philadelphia Zoo (Aazpa Newsletter, Jan. 1965).

Breeding potential in captivity: The Frankfurt Zoo has bred four. (5:337)

Remarks: "Mainly nocturnal, it lies concealed during the daytime in covert, and prefers damp to dry situations. It is a shy and solitary creature, which never ventures to attack or otherwise molest human beings, and feeds chiefly upon rodents, although sometimes killing deer and, in settled districts, occasionally sheep. Such birds, reptiles, and the larger kinds of insects as it can catch also contribute to the diet of the maned wolf; and fruit is said to be sometimes consumed by this animal. South America is the home of numerous smaller representatives of the dog family presenting a considerable superficial resemblance to foxes, by which name they are universally known ... Strictly speaking, however, they are not foxes at all, in the scientific sense of that term, as is shown by the structure of their skulls, which differ in several important respects from that of the common fox and its immediate relatives. Inclusive, apparently, of the maned wolf, these South American species form a peculiar group of the dog tribe, with no near kindred either in North America or in the Old World." (1:427)

References:

1. Lydekker, 1901	4. Walker, 1964
2. Cabrera, 1957-60	5. Jarvis, 1965
3. Burton, 1962	6. H. Krieg in litt. 15/8/65



BUSH DOG

Speothos venaticus (Lund, 1842)

Order CARNIVORA

Family CANIDAE

Distinguishing characteristics: "The general color is brown, with orange, tawny, or whitish fore parts. The hindquarters, bell, and tail are darker than the general coloration, sometimes almost black. Pale patches or bands often occur on the upper and under parts ... The bush dog is stocky with short legs and tail, the hair is long, and the tail is well haired but not bushy;" (2:1164)

Present distribution: "The single species, *S. venaticus*, inhabits Panama, eastern Colombia, the Guianas, Brazil, Paraguay, eastern Peru, and northern Bolivia. Wooded and savannah areas, often in sandy soil, are frequented." (2:1164)

Former distribution:

Status: "These bush dogs are apparently truly rare everywhere ... Little is known about their habits in the wild." (1:82-83)

Estimated numbers: Unknown.

Breeding rate in wild: "One female with two juvenile offspring was found swimming across Rio Negro in the month of July. The female was pregnant. Litters of four and five pups have been recorded in the San Diego Zoo." (2:1164)

Reasons for decline:

Protective measures already taken:

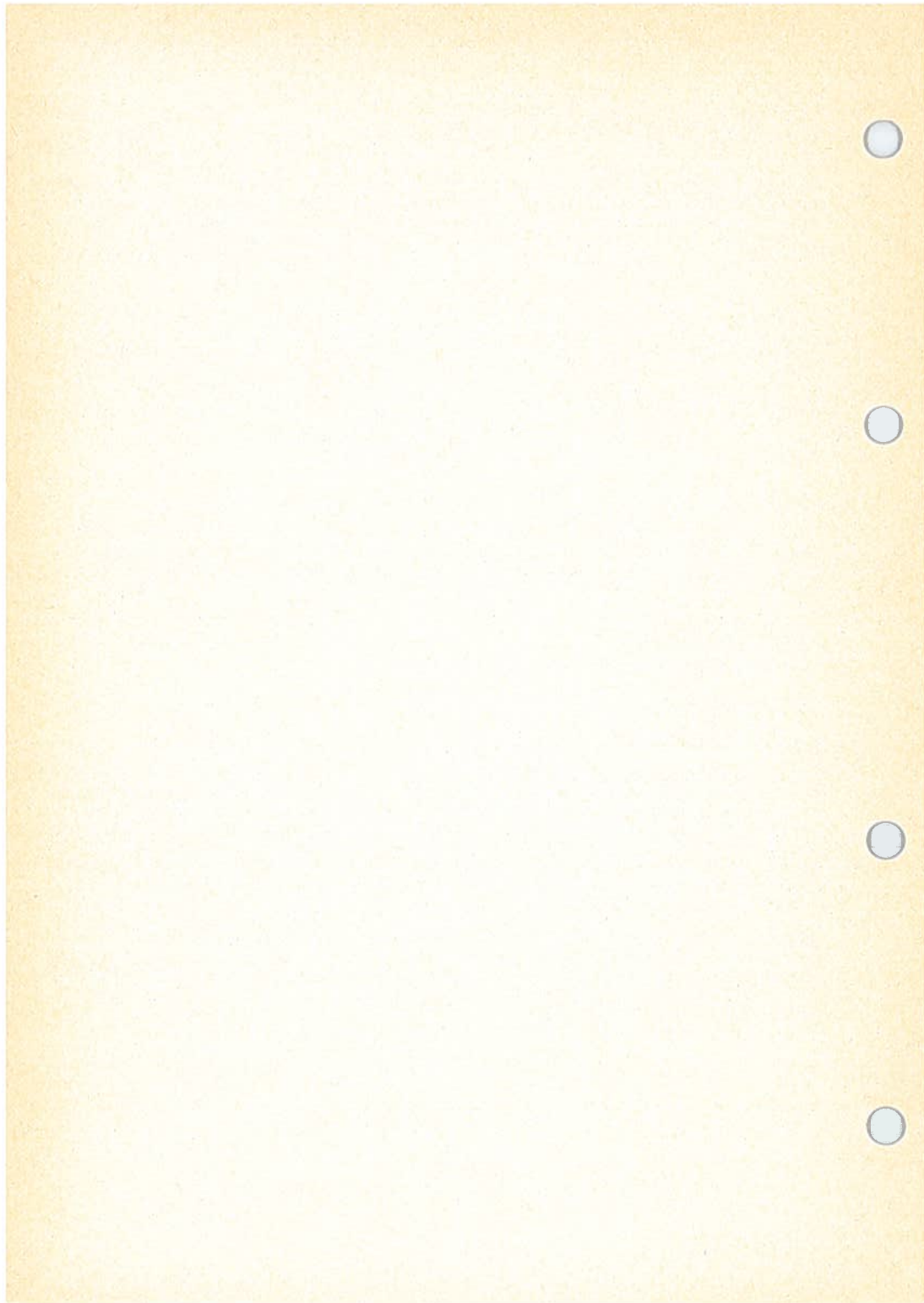
Measures proposed:

Number in captivity:

Breeding potential in captivity: "We had the good fortune to keep a bush dog alive at the Villavicencio laboratory for several months. It was brought to us by a countrywoman who had raised it from infancy, allowing it to run freely about her 'rancho' and in general treating it as she would a dog. Certainly it was very doglike in its actions, and seemed to be as well adapted to life with man as any true dog ... I would think, judging from the behaviour of this one captive individual, that the species could be easily domesticated ..." (1:82-83)

Remarks: "[Its] closest relatives are the dhole of Asia and the Cape hunting dog of Africa. Like these, it is the last survivor of a very ancient subfamily and is only distantly related to other living canines." (1:82)

References: 1. Bates, 1964
2. Walker, 1964



SPECTACLED BEAR

Tremarctos ornatus (F. Cuvier, 1825)

Order CARNIVORA

Family URSIDAE

Distinguishing characteristics: "In coloring and pattern both northern and southern races are apparently alike. The entire body is uniformly black or blackish brown, except that usually there is a narrow line of white beginning on each side about halfway between the ear and the eye, continuing forward nearly to the bridge of the muzzle in front of the eye, then turning downward across the cheek to the midline of the throat, and continuing parallel with the corresponding mark of the other side to the chest. This mark, which from the semicircle about the eyes, gives the bear its English name, shows, however, considerable variation. Its upper part may be washed with pale yellowish; again, the muzzle may be light tan, or more extensively whitish, to include the forehead, nose, cheeks, and throat. As an opposite extreme, the white markings may be lacking altogether in animals from the same region." (1:397)

Present distribution: Occurs in "South America from the Pacific slopes of the Andes on the west to the Amazonian and Orinocan slopes on the east, from the Caribbean and Lake Maracaibo drainages in the north to southern Peru and southwestern Bolivia in the south. They also occur in the Cordillera Macarena, a low isolated mountain range east of the Colombian Cordillera Oriental. Spectacled bears are primarily forest dwellers but they make frequent forays into the temperate zone grasslands or clearings atop the Andes, and into the tropical zone savannas and scrublands at their bases." (2:122) "Inhabits the mountainous regions of western Venezuela, Colombia, Ecuador, Peru and western Bolivia to 3,000 meters in elevation and may possibly occur in Panama." (4:1171) Referring to the possible occurrence of the animal in Panama Hershkovitz (1957) states: "I found no signs of bears in the foothills of the Serrania del Darien on the Colombian side of the boundary. However, the species does occur in the Andean Cordillera Occidental as far north as the latitude of Turbo, a port on the Golfo de Uraba across from Panama." (2:122) "Nearly all living specimens today come from Northern Peru and Ecuador." The range of this species on the western slopes of the Andes appears to be fairly restricted as well as being isolated from the main part of its range which is situated east of the Andes. (3:120)

Former distribution: Venezuela, Columbia, Ecuador and Peru as far as Bolivia. "The most southerly authenticated museum specimen came from northern Bolivia (Krumbiegel, 1940) and southern Peru (Gray, 1873). The northernmost bear has been described by Lönnberg in 1910 as coming from the southern part of western Venezuela. ... Cuvier's specimen (1831) supposedly came from as far south as Chile, and this is the southernmost record. Since then no further records have come from Chile so that we are compelled to question Cuvier's report." (3:120)

Status: "Various writers reiterate that very little is known of this bear beyond the fact that it seems to be rare throughout its range and is seldom

seen or hunted." (1:398) Hershkovitz (1957) states that "spectacled bears are still common in many parts of South America." (2:122) The First World Conference on National Parks, Seattle, 1962, (Recommendation No. 25) catalogued the spectacled bear as one of the mammals of the South American Andes threatened with extinction.

Estimated numbers: Unknown.

Breeding rate in wild: Unknown: normally 1 - 2 cubs are born under captive conditions. Births appear to occur at widely differing times of the year. "The bear's ability to produce young at different seasons is interesting in connection with the general question of a possible temporary interruption in the development of the embryo in bears and of those factors which influence spontaneous development and parturition." (3:127) "We are unable to establish the gestation period more accurately than that it was between 194 and 208 days." (5:111)

Reasons for decline: The decline is "due to the rapid and extensive destruction of their forest habitat." (Seattle Conference Recommendation No. 25)

Protective measures already taken:

Measures proposed:

Number in captivity: 28 ♂♂ and 17 ♀♀ + 1 in 22 zoos. (6:378)

Breeding potential in captivity: Of the above, 9 ♂♂ and 3 ♀♀ + 1 were born in captivity. (6:378) "The breeding of spectacled bears in captivity is perfectly feasible, once they have been acclimatized. This is proved by the successful breeding which has occurred at Gelsenkirchen, Basle and Berlin zoos." (3:124)

Remarks: "Tremarctos is the only South American bear." (4:1171)

References:

1. Allen, 1942
2. Hershkovitz, 1957
3. Roth, 1964
4. Walker, 1964
5. Gensch, 1965
6. Jarvis, 1965

MEXICAN GRIZZLY BEAR

Ursus nelsoni Merriam, 1914

Order CARNIVORA

Family URSIDAE

Distinguishing characteristics: "Very large with massive head, small ears, and high forehead, which gives the face a concave or 'dished' profile. Adults have a distinct shoulder hump which black bears lack. Claws of forefeet long (up to 80 mm.), only slightly curved, and light-coloured. (Black bears have short, black claws, "hooked" to permit tree climbing). Fur brown but may vary from pale golden to dark umber. The skin of an old male killed in the Sierra del Nido, Chihuahua, in 1955 is dark umber in general color, with areas of tan on the face and backs of the legs; scattered white hairs on the back give a grizzled appearance. A yearling bear from the same area (pelt examined at Rancho Providencia) is rather uniformly chocolate brown." (1:416)

Present distribution: "Currently grizzlies are known only from the Cerro Campana (50 miles north of Chihuahua City) and the adjoining Santa Clara and Nido ranges extending to the northwest of that point." (1:418)

Former distribution: "Originally northern Baja California, north-eastern Sonora, most of Chihuahua and Coahuila and northern Durango. ... How long the grizzly persisted in Baja California is not known, but it has been extinct there for at least several decades." (1:418)

Status: "This race was believed to have been extinct for many years. But a few years ago Starker Leopold ... rediscovered a small population in the Sierra del Nido of Mexico." (2:18) "The few remaining grizzlies are endangered by overhunting and unless some rapid and decisive action is taken by the government to protect these majestic animals, there will soon be no more." (1:421)

Estimated numbers: Leopold's "estimate is that there are between 30 and 40 individuals in this small range of mountains." i.e. the Sierra del Nido. (2:18)

Breeding rate in wild: "It is believed that young grizzlies do not mate until they are four or five years old, and thereafter the female gives birth to young only every second or third year. A litter consists usually of one or two cubs, rarely of triplets. With so low a breeding potential it is self-evident that a grizzly population cannot withstand a heavy annual kill. Grizzlies retire in winter in the manner of black bears, and the females have their young in January or February during the winter sleep. Newborn cubs are about the size of little black bears and they develop even more slowly. The mother cares for the young through two full seasons before they are able to make their own living. Full growth is not attained until the age of eight or ten years. Thereafter, under natural conditions, the life expectancy of a

grizzly is long. In zoological parks some individuals have lived to be thirty years old, and the larger carnivores live longer in the wild than they do in captivity." (1:423)

Reasons for decline: "The grizzly has been virtually exterminated by man and his dogs, traps, poisons and .30-30 rifles." (1:418) "Thus in a period of less than half a century the grizzly bear was reduced from abundance to extinction along the United States border and in the northern Sierra Madre." (1:420)

Protective measures already taken:

Measures proposed: "The grizzly bear is so nearly extinct in Mexico that it should be given immediate protection. A field survey should be made at once to find out how many grizzlies still survive in that country, and to ascertain what measures can be taken to protect the remaining animals. It is not impossible that the creation of a national preserve or park might still save the species in Mexico, just as Yellowstone Park did in the United States." (1:423)

Number in captivity:

Breeding potential in captivity:

Remarks: "The greatest danger arises from the introduction of sodium fluoroacetate, the poison 1080, on to the very restricted range of this interesting form. Already a female bear and her two cubs have been found dead close by one of the poison stations ... the finding of 3 dead suggests that several others may also have been victims." (2:18)

References: 1. Leopold, 1959
2. Cowan, 1964

BARREN-GROUND GRIZZLY BEAR

Ursus richardsoni Swainson, 1838

Order CARNIVORA

Family URSIDAE

Distinguishing characteristics: "Contrasted with that of the grizzly, the skull is shorter and wider, with the muzzle abruptly truncated, so as to give a kind of 'pug-nosed' appearance. This shortening, according to Dr. Merriam, is especially noticeable in the region of the brain-case, the posterior roots of the cheek-arches being approximated to the occiput. In young individuals the top of the skull is flattened, but in full-grown animals it rises abruptly at the sockets of the eyes, to become convex above the brain-case. The last lower premolar tooth lacks the anterior inner cusp. Dr. Merriam regards this bear as most nearly related to the Alaskan form of the grizzly, from which, however, it is markedly distinct." (1:103-104)

Present distribution: "In summer, grizzly bears may be found in a wide belt of country, extending in Canada from the Yukon Territory eastward between the Arctic coast and Great Slave Lake. East of Bathurst Inlet, they seldom reach the coasts, and are rarely seen away from the large, northward and eastward flowing rivers, the Thelon, Back, Dubawnt and Kazan. Of these, the Thelon River is the only one on which bears are sighted with any regularity. A few are seen near it every year as far east as its junction with the Dubawnt, and occasionally even further downstream. ... Summering grizzly bears are more common west of Bathurst Inlet, particularly in the Mackenzie River delta." (2:4-5) "Den sites are believed to be numerous near the Mackenzie River, in the Richardson Mountains and elsewhere, for bears are common along the wooded banks of the lakes and channels of the delta in spring. ... it seems fairly certain, as Schwatka surmised in 1889, that the barren ground grizzlies of the eastern tundra retreat to the tree line or to forest outliers for their winter sleep." (2:4)

Former distribution: "Its range includes the Barren Grounds between Hudson Bay and the Mackenzie, and may perhaps extend some distance westward of that river." (1:103)

Status: Despite a history of occasional observations extending over a period of nearly two centuries, very little is known about the barren ground grizzlies of the Northwest Territories." (2:4) "[Now that the animal has been deprived of legislative protection its status] has changed, and there are grounds for grave concern. The evidence leads us to believe that the barren ground grizzly bear population cannot stand regular exploitation of any kind." (2:8)

Estimated numbers: "We don't know how many barren-ground grizzlies survive in the Northwest Territories, but it is unlikely that more than 1,000 remain, and 500 could be a closer estimate." (2:2)

Breeding rate in wild: "The rutting period is centred on the end of June, though couples may occasionally be seen any time between May and October. Both sexes retire to dens in early winter - late October or early November in northern Canada - and the cubs are born about December. ... A grizzly bear may produce up to six cubs at birth, according to M. Couturier, who estimates that a female may give birth every two years, and bear up to 12 litters of two cubs each in a lifetime. K.R.D. Mundy indicates that three years between litters is probably more the rule in Glacier National Park, British Columbia. ... The average [litter size] in the Canadian national parks is close to two, and the mean of 14 litters of cubs and yearlings sighted in the Northwest Territories in 1957 and 1958 was also two." (2:3)

Reasons for decline: The animal's characteristics "mark the large bears out for a life of conflict with man. The grizzly bear can be a competitor for foods that a human may consider his by right, for himself or for his domestic animals. It can be a source of personal danger to man by virtue of its size, strength and courage. It can also be appallingly destructive of man's houses and chattles. Grizzlies are hated and feared by many of the people who live uneasily within their range, and demands for their reduction and extermination are heard frequently." (2:4) "Their urge to fatten themselves before denning occasionally drives the grizzly bear to depredations on cached supplies of caribou meat. Therefore, to protect their feed caches the Eskimos attempt to shoot any bears on their hunting grounds. ... Also in late Autumn, grizzlies may become a nuisance on the reindeer grazing grounds of the lower Mackenzie River, and are often destroyed by the herders in the belief that their stock is in danger." (2:5) "The barren ground grizzly bear was long protected against extermination by the scarcity and timidity of the people with whom it shared its enormous range. With primitive weapons, bear hunting must have been an almost desperate undertaking. Even with the coming of the first rifles to the central barrens in the 19th century, the large bears were rarely molested. Later, after acquiring repeating rifles, more hunters were prepared to attack the grizzly bear, and it may be that a period of reduction accompanied the advent of modern firearms." (2:6)

Protective measures already taken: "Protective legislation was passed first in 1943, providing a close season on bears from June 1 to August 31. ... In spite of the curtailing of the open season, the numbers of bears continued to decline, and year-round protection was instituted in 1949. The legislative protection of the barren ground grizzly bear gave hopeful results, and in the 1950's the frequency of sightings increased considerably. ... With the increase in bears, and the volume of protest, the Territorial Council in 1960 legalized the killing of grizzlies for the protection of life and property." (2:7-8) "[More recently, however, the animal was] deprived of legislative protection by an amendment to the Territories' Game Ordinance. The amendment, proposed by the Territorial Council in the winter of 1963-64, was unsuccessfully opposed by the Canadian Wildlife Service ..." (2:2)

Measures proposed: "Adequate research should have preceded any legislation which lessened this magnificent animal's chances of survival in such a poorly known area." (2:8)

Number in captivity:

Breeding potential in captivity:

References: 1. Lydekker, 1901
2. MacPherson, 1965

POLAR BEAR

Thalarctos maritimus (Phipps, 1774)

Order CARNIVORA

Family URSIDAE

Distinguishing characteristics: "One of largest bears and most carnivorous. Males average 7' - 8', maximum 9', height at shoulders up to 5', weight average 900 lb., maximum 1,600 lb. Stump of tail only. Female average weight 700 lb. Coat a uniform white with yellow tinge. Head long, with "roman" nose, long neck, powerful limbs and broad feet with hairy soles." (1:151)

Present distribution: May occur seasonally in the vicinity of the northern and northwestern coasts of Alaska. "In Canada a quadrangle (63°N - 75°N and 60°W - 95°W) encloses the most productive polar bear areas." The east coast and particularly the fiorded northeastern coast of Greenland are "especially attractive to the animals, largely because seals are so abundant there." "Bears are abundant also in Svalbard, a group of islands including West Spitzbergen." "The best denning areas in the Soviet Union occur chiefly on the archipelagos north of the mainland coast. Those areas include Franz Josef Land, Novaya Zemlya, Severnaya Zemlya, the New Siberian Islands, and Wrangel Island." "Occasionally, in Canada, Alaska and the Soviet Union, polar bears have been known to penetrate 100 miles or more inland from the mainland coasts. They rarely appear in the zone of permanent north polar ice, but have been recorded as far north as 88°." (2:5-6)

Former distribution: "The polar bear's range has shown signs of significant contraction since the 1930's at least." (2:5)

Status: "Generally, it seems that Alaska, Canada, and perhaps Norway possess the 'healthiest' white bear populations. Significant depletions, attributed to over-hunting have occurred in Greenland and the Soviet Arctic since about the 1930's. Still, environmental and ecological conditions may exert an unknown but powerful influence where such depletions take place. Spärck's figures clearly indicate a decline in polar bear stock which is most pronounced in the western and southeastern coasts of Greenland." (2:10) As a result of protective measures taken by the Soviet authorities, the bear population has remained stable since 1960 and may have increased slightly. (3:318)

Estimated numbers: Uspensky estimates the total world population to be about 5,000 to 10,000. (3:319) Harington considers the total to be "well over 10,000", including 6,000 - 7,000 in the Canadian Arctic. "Probably the total annual kill of polar bears now approximates 1,300." (2:10)

Breeding rate in wild: Denning commences about October and the young are born in late November or early December. Twin births are usual. "Mating usually occurs in April ... The gestation period averages about eight months, and although there is no scientific proof of delayed implantation in polar bears, there is good reason to believe that it exists ... Females become sexually mature when they are approximately three years old, males when they are four. Adult females bring forth cubs the third winter after a previous birth, or sooner if her cubs die or are lost. This accounts for the rather slow rate at which depleted populations may revive. It has been estimated that white bears remain fertile to 25 years of age." (2:7-8)

Reasons for decline: "Intensive hunting of polar bears began in the early 17th century when ships started piercing the core of their range ... When the sealing industry began to replace the impoverished whaling industry, a more deadly pressure was exerted on the ice bears, particularly in the waters east of Spitzbergen and Franz Josef Land, the Greenland Sea and the Canadian Eastern Arctic. In 1924 Norwegian seal hunters alone killed 714 polar bears. The later-developing fur trade was an additional stimulus to exploitation of this natural resource." (2:5) Uspensky states that the range of the species has been reduced, probably as a result of the onset of milder climatic conditions in the Arctic. Moreover, numbers of humans and domestic livestock in the Arctic have increased in recent years and this has resulted in a higher incidence of disease. (5)

Protective measures already taken: "In Canada, only Eskimos, Indians and the few holders of general hunting licences may legally hunt" the species. In Manitoba, Ontario, Quebec and the Northwest Territories sportsmen are not permitted to hunt them. On the northeast coast of Greenland hunting is prohibited between June 1st and October 31st. In the Norwegian Arctic the species is protected on King Karls Land and in adjacent territorial waters, and there are limitations on capture of cubs. "Otherwise polar bears can be hunted throughout the year, in any part of the archipelago. There is a bag limit of one bear each to foreigners hunting in the Norwegian Arctic." "The Canadian Wildlife Service initiated a five-year polar bear project in 1961. The objectives are to review the effectiveness of protective legislation and to integrate, verify and add to the scattered and often fragmentary information existing on polar bears." In the Soviet Union S.M. Uspensky is currently undertaking a study of the animal on Wrangel Island. (2:9-11) "In 1956 the Russian parliament adopted a special decree ... which imposed a ban on shooting polar bears in the Soviet Union ... This law was introduced following the recommendation of the 1955 [IUCN] General Assembly that the Arctic countries should take measures to protect the polar bear." Cubs may not be caught in the Soviet Arctic except under special licence. In 1960 a reserve was established on Wrangel Island, one of the most important denning areas in the Soviet Arctic. (3:318)

Measures proposed: "There is a definite need for an internationally co-ordinated programme of marking polar bears, once an effective technique is developed. This would indicate how much of an international problem polar bear management is ... Appropriate international meetings on polar bear conservation should be initiated when and if the evidence shows them to be necessary. Meanwhile, until we know enough about numbers and movements to begin really enlightened management programmes, each nation concerned should make every effort to protect adequately this valuable and impressive wildlife species." (2:11) An international agreement restricting the hunting of polar bears is urgently required as well as adequate local restrictions. (5)

Number in captivity: The polar bear is one of the most commonly exhibited bears in captivity, few of even the minor zoos not showing it. I would say that there are no less than 1,000 (mainly of the nominate race) in zoos, perhaps even more. The average zoo of any size usually has at least a trio or more: some, like East Berlin, have a dozen. (4)

Breeding potential in captivity: Breeds readily in zoos. (4)

References:

1. Burton, 1962
2. Harington, 1964
3. Uspensky, 1965
4. Marvin L. Jones in litt. 13/4/64
5. G.P. Dementiev in litt. 21/4/65

GIANT PANDA

Ailuropoda melanoleuca (David, 1869)

Order CARNIVORA

Family PROCYONIDAE

Distinguishing characteristics: "Bear-like, 6' long, with mere stump of a tail, 300 lb. weight. Fur thick, dense. Coat white, with black legs and shoulders, black ears and black round eyes. Forefoot has small pad which acts as a thumb for grasping. Cheek-teeth very broad. Skull deep with prominent ridges for attachment of powerful muscles needed in masticating fibrous shoots." (2:156)

Present distribution: "The giant panda apparently has a very restricted distribution in the high mountains of western Szechwan and eastern Sikang in western China. This is the area of the extremely complex mountain escarpment that sharply separates the Min River Valley from the Tibetan highland to the west. ... The distance between the southernmost record (Yehli) and the northernmost (25 miles west of Wen-chuan) is only about 175 miles. All records, except Yehli, are on the slopes of the Chuang-lai mountains surrounding the valley of the Min River. Yehli, where the Roosevelt brothers shot their panda, is on the slopes of the Ta-liang Mountains south of the Tung River. ... The vertical distribution of Ailuropoda is as limited as its geographic distribution. All who have studied its habits agree that this animal is sharply limited to the bamboo zone, which lies between about 5,000 and 10,000 feet." (3:17)

Former distribution: "Ailuropoda had a much more extensive distribution in comparatively recent geological times, as is shown by the two fossil records. Smith-Woodward (1915) described a Pleistocene panda under the name Aelureidopus baconi from Mogok, Northern Shan States, Burma. This is in the Irrawaddy River drainage and is more than 500 miles southwest of the southern limit of the panda's range as now known." Granger (in Matthew and Granger, 1923) found giant panda material, which was named Aeluropus fovealis, in Pliocene deposits near Wan-hsien in eastern Szechwan. Wan-hsien is situated on the Yangtze River (of which the Min is a tributary), about 250 miles due east of Chengtu." (3:17)

Status: "According to some explorers it is fairly plentiful in the areas where it occurs, while others say it is only moderately so." (1:250)
"Prospects of survival considered excellent." (6) "Rare, but not endangered." (8)

Estimated numbers: "The Director, [of the Peking Zoo], refused to commit himself to any estimate, saying that they had no means of taking any sort of count, but they were sure the number is small. On the other hand they are sure that the numbers will now increase, as the government is taking care and the local people now understand the interest of the animal and protect and treasure it." (7)

Breeding rate in wild: "Oestrus in April; 148 day gestation; age at sexual maturity unknown." (8)

Reasons for decline: Inapplicable? "Its skin has a small commercial value (\$ 10 or thereabouts), and it does not appear to be much hunted by the natives. Recent expeditions on the part of American and other explorers after the giant panda have led the native hunters to believe there is a demand for this animal's skin, and consequently a number have been shot or trapped which otherwise would have been left alone." (1:250)

Protective measures already taken: Strictly protected by the Game laws.
No special reserve exists but there is much local pride in the species. (6)

Measures proposed: None.

Number in captivity: Chengtu 3; Chungking (No. unknown); Hangchow 1 ♀;
Harbin 1 ♂; Nanking 1 ♀; Peking 3 ♂♂, 4 ♀♀; Shanghai 1 ♂, 2 ♀♀; Pyongyang
(N. Korea) 1 ♂, 1 ♀; Moscow 1 ♂; London 1 ♀. (8)

Breeding potential in captivity: Bred successfully for the first time by
the Peking Zoo, September 1963. A second (♀) was born 4/9/64 at Peking.
Shanghai ♀ thought to be pregnant (Sept. 1965). (8)

- References:
1. Sowerby, 1937
 2. Burton, 1962
 3. Davis, 1964
 4. Walker, 1964
 5. Jarvis, 1965
 6. Tso-Hsin Cheng in litt. 14/6/61
 7. Hon. I. Montagu in litt. 4/1/65
 8. C. Jarvis in litt. 13/2/65 & 7/1/66

BLACK-FOOTED FERRET

Mustela nigripes (Audubon & Bachman, 1851)

Order CARNIVORA

Family MUSTELIDAE

Distinguishing characteristics: "Pelage pale yellowish buff becoming nearly white on face, throat, ventral half of body; top of head and middle of back brown; black mask across eyes; feet, legs, and terminal fourth of tail black to blackish brown; remainder of tail whitish or with top side like back. Pelage in winter only slightly paler than in summer." (3:915)

Present distribution: "... the interior plains of North America, east of the Rocky Mountain foothills, from western North Dakota to northern Montana and Alberta and thence southwards to Texas and central New Mexico." (1:183)

Former distribution: "The geographical range of the black-footed ferret nearly coincides with the range of the prairie dogs (genus Cynomys)." (3:915) Great plains, Alberta and Saskatchewan to Texas and Arizona, to 10,500 ft. in the Rockies. (4:13)

Status: Reduced to a precariously low level and now on the verge of extinction. (4:13)

Estimated numbers: "During the period 1946 - 1953, a total of 50 to 70 black-footed ferrets were reported from 42 localities, mostly in South Dakota, Montana, Nebraska and Colorado. About one-third of the animals seen were found dead or were destroyed. Rodent-control operations may have added to the toll by destruction of food supply, disturbance of habitat, and direct or indirect poisoning." (2:424) "Some 24 observers, most of them Bureau employees, have reported over 55 sightings (6 of these were road kills) of black-footed ferrets since 1955. They have been reported in each of the last 8 years. The latest report was from Jones County, South Dakota, September 22, 1963. The ferrets have been reported from 15 counties in South Dakota during this interval and one county, Burleigh, in North Dakota." (8)

Breeding rate in wild: Probably one litter (of 2 young?) per year. (4:13)

Reasons for decline: "The ferret may be dependent on the burrows of the prairie dog for shelter and on the occupants of the burrows for food." (3:915) Destruction of its host species, the prairie dog; elimination of den holes; destruction of original grasslands. (4:13) Extensive poisoning campaigns have probably contributed to the decline. (7)

Protective measures already taken: "Arrangements were completed in March, 1954, between the Fish and Wildlife Service and the National Park Service, whereby the former agency will release in the parks those ferrets that can be live-trapped from areas scheduled for rodent-control operations." (2:424) Three black-footed ferrets (sex unknown) used in the film Vanishing Prairie were released in Wind Cave National Park, South Dakota and are believed still to be there although they have not recently been seen. (5:105) Employees of the Fish and Wildlife Service have been instructed to maintain confidential records and to do what they can to discourage capture or molestation of the black-footed ferret. (8)

Measures proposed: "Two measures are advocated: 1. A life history study of the ferret is needed to determine its ecological requirements and other needs that are basic to perpetuation. 2. Populations of ferrets should be established on sanctuaries where large colonies of prairie dogs can be maintained undisturbed. Ferrets can be obtained by live-trapping animals from areas where prairie dogs are to be exterminated. Wind Cave and Theodore Roosevelt National Parks are possible sites if the above requirement can be met." (2:424)

Number in captivity: Dallas 1 ♂ and 2 ♀♀: Granby 1 ♂ and 1 ♀. (6:379)

Breeding potential in captivity:

Remarks: "This ferret is of special interest on account of its being in North America the only representative of the Old World group of black-bellied weasels to which the polecats and their relatives of eastern and northern Asia belong." (1:183)

References:

1. Allen, 1942
2. Cahalane, 1954
3. Hall & Kelson, 1959
4. Fish & Wildlife Service, 1965
5. Homolka, 1965
6. Jarvis, 1965
7. J.W. Aldrich in litt. 11/6/63
8. U.S. Fish & Wildlife Service in litt. 30/10/63

GIANT OTTER

Pteronura brasiliensis (Gmelin, 1788)

Order CARNIVORA

Family MUSTELIDAE

Distinguishing characteristics: "Head and body length is 1 to 1.5 meters, and tail length is about 0.7 meter. One individual, crammed with food, weighed 24 kg. Coloration is chocolate-brown, with a whitish or creamy chest patch. This otter is similar in general appearance to the otters of the genus Lutra except that it is larger, usually has a larger patch on the chest, and the long, flattened tail has flanged or corded margins on either side." (2:1217)

Present distribution: "Eastern rivers of Brazil, from the Guayanas south to Paraguay, extreme north-east of Argentina (rivers Parana and Uruguay) and the Rio Negro, Uruguay." (5) "In Venezuela the giant otter occurs in the Orinoco River and its tributaries, as well as in the region of the Llanos and in the Guayana and the Territorio Amazonas. It has been collected in the following rivers: Orinoco, Caura, Ventuari, Apure, Arauca, Cunaviche, Capanaparo, Claro, Aguaro and Cinaruco. It undoubtedly occurs in many other rivers in the Llanos and Amazon region." (5) "It is usually found in streams with relatively slow currents and in calm tributaries." (2:1217)

Former distribution:

Status: Local reports state that in Amazonas "the giant otter is on the way out unless something drastic is done to help it. These big, brown otters have become so rare that a skin now brings \$ 70 and few come down from the upper rivers. They are mostly killed by the Indians for meat." A Swiss animal dealer at Iquitos, Peru, stated that "he had handled only seven giant otters in the past three years and doubts if there are many left in the Peruvian Amazon." (4) "Extinction is not imminent in Venezuela, but the otter has declined considerably in those rivers, especially the Apure, which are easily accessible to hunters." (5)

Estimated numbers: Unknown.

Breeding rate in wild: The giant otter is monogamous: gestation period is probably about 3 months: 1 - 3 (usually 2) in a litter: it is not known whether breeding occurs more than once a year. (5)

Reasons for decline: "During recent years the giant otter has been heavily persecuted for its fine pelt. Those taken in Venezuela are usually marketed in Colombia where a better price is obtained." (5) "The hide is sought

after by natives as a source of leather, but Pteronura is difficult to hunt because of its habit of diving under water when hit and swimming to a secluded spot." (2:1217)

Protective measures already taken:

Measures proposed: "The Venezuelan Ministry of Agriculture and Livestock (Ministeria de Agricultura y Cria) should be requested to take urgent measures to protect the animal, but this alone would be useless without also obtaining the co-operation of the Colombian authorities with the object of prohibiting (or at least controlling) the importation of otter pelts." (5)

Number in captivity: 5 ♂♂ and 11 ♀♀ in 8 zoos. (3:379) "The female Giant Otter that arrived at Cologne Zoo in March 1960 was already quite tame after a period of only eight days." (1:81)

Breeding potential in captivity: "Giant otters have bred on several occasions in the Parque del Este (Caracas) but on each occasion the male has killed the young." (5)

- References:
1. Zeller, 1961
 2. Walker, 1964
 3. Jarvis, 1965
 4. Philip K. Crowe in litt. 8/2/64
 5. C. Pedro Trebbau in litt. 28/7/64

SOUTHERN SEA OTTER

Enhydra lutris nereis (Merriam, 1904)

Order CARNIVORA

Family MUSTELIDAE

Distinguishing characteristics: "Specialised otter, 4' long including foot-long tail, wt. up to 80 lb. Hind-feet long, broad, flipper-like. Forefeet comparatively small. Fur dense, thick, glossy, brownish-black sprinkled with white-tipped hairs. Ears almost hidden in fur. Eyes small. Teeth number 32, against 36 of river otters." (5:169) "The distinction between the northern sea otter and the southern race rests apparently upon slight cranial differences." (2:417)

Present distribution: "In 1957, California sea otters were restricted to a narrow zone extending from north of Santa Barbara to Carmel Bay, California. (3:288) "Rediscovered in 1938 off Bixby Creek, Monterey County, these animals have extended their range southward at least to Point Conception and probably to the Channel Islands. Northward movement, however, has been slight, with the species now regularly occurring in Carmel Bay and around part of the Monterey Peninsula." (7:122)

Former distribution: The Pacific Coast from Washington to central Baja California. (8:36)

Status: Once nearly extinct, but now recovering. (8:36)

Estimated numbers: 850 - 900. (8:36)

Breeding rate in wild: "Elaborate courtship. Mating throughout year. Gestation 240 - 270 days. Usually 1 young, occasionally 2, born at sea, furred, eyes open, fully-developed teeth and able to swim. Nursed for 1 year, mother holding young in arms to sleep as she swims on back." (5:169) "[Studies indicate] that two years usually elapse between births..." (6:20) Births take place on the kelp beds and at any season. (1:132)

Reasons for decline: "... occurred off the coast of California in considerable numbers prior to the twentieth century. Heavy exploitation reduced it to virtual extinction, and the last individual was supposedly killed in 1911 south of Fort Ord, California." (3:287) "Extinct off Washington and Oregon since 1876." (8:36)

Protective measures already taken: "Protected by California law within three mile limit; on high seas, Federal law protects it from U.S. nationals." (8:36)

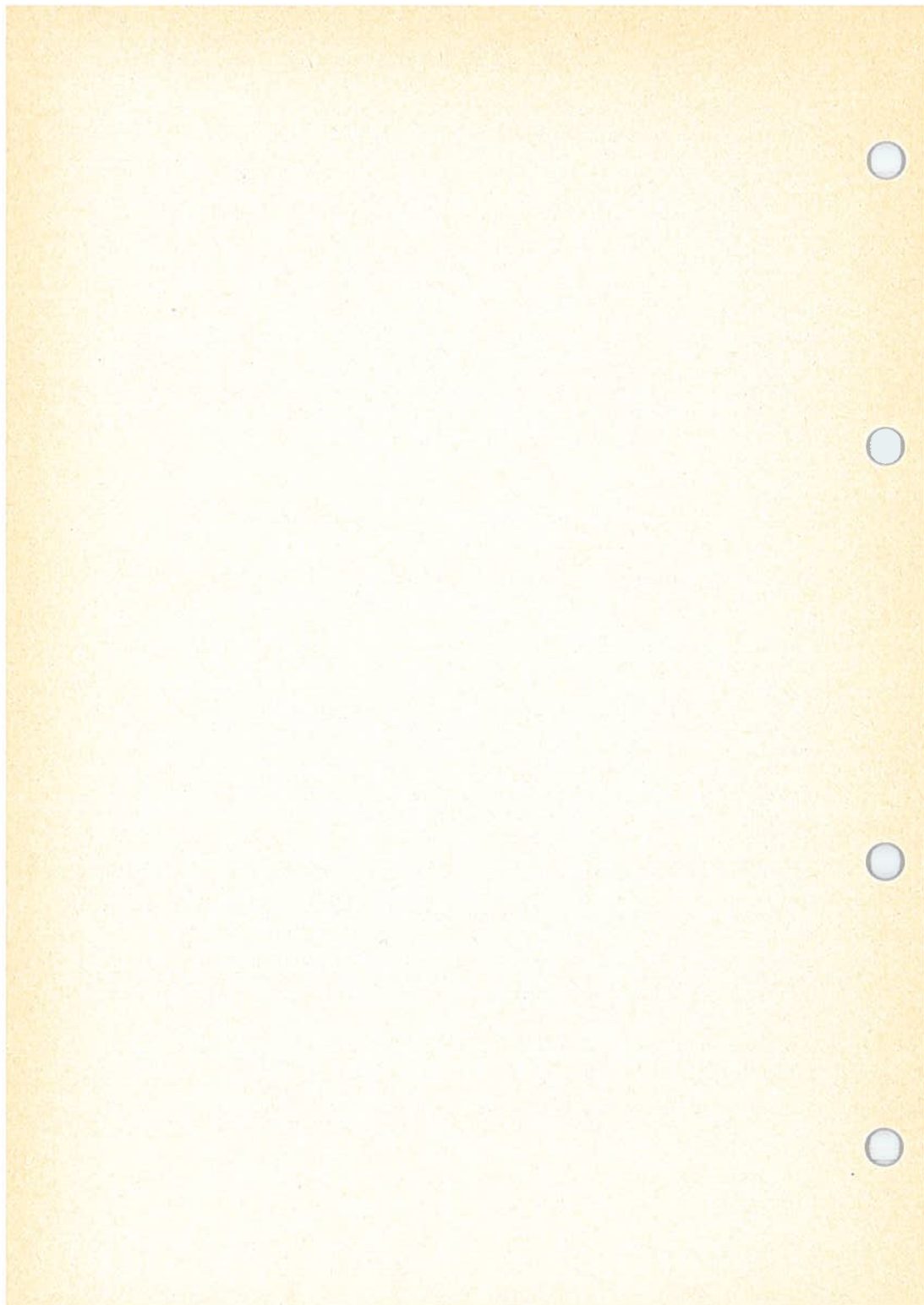
Measures proposed: There is little hope of re-establishing sea otters in much of their former range along the Pacific coasts of U.S. and Canada unless oil pollution of the seas can be effectively controlled. If soiled the soft fur loses its insulating properties and as a result the animals may die from chill and exposure. (6:17)

Number in captivity: So far as is known only a single sea otter (a female) has ever been kept in captivity. She was about 18 months old when captured and lived for 6 years at the Woodward Park Zoo, Seattle, until she died in October, 1961. (5:27-28)

Breeding potential in captivity: Has never bred in captivity.

References:

1. Fisher, 1940	5. Burton, 1962
2. Allen, 1942	6. Kenyon, 1963
3. Boolootian, 1961	7. Orr & Poulter, 1964
4. Vincenzi, 1961	8. Fish & Wildlife Service, 1965



OWSTON'S BANDED CIVET

Chrotogale owstoni Thomas, 1912

Order CARNIVORA

Family VIVERRIDAE

Distinguishing characteristics: Head and body length 508 - 635 mm.; tail 381 - 482 mm. "The body and base of the tail have alternating and sharply contrasting dark and light transverse bands, and longitudinal stripes are present on the neck. The pattern of stripes and bands resembles that of Hemigalus, but is supplemented by black spots on the sides of the neck, the forelimbs and thighs, and the flanks. Four seems to be the maximum number of dorsal bands. It has been suggested that this striking pattern serves as warning coloration, as this species is believed to possess a particularly foul-smelling anal-gland secretion. The under parts are pale buffy, and a narrow orange mid-ventral line runs from the chest to the inguinal region. The terminal two-thirds of the tail are completely black. Chrotogale is distinguished structurally from similar genera by dental and skull characters." (3:1240)

Present distribution: "Tonkin and Laos, in Indo-China." (2:292)

Former distribution:

Status: "The single species, C. owstoni, is known from only about 15 specimens ..." (3:1240) "This animal is rare ..." (1:181)

Estimated numbers: Unknown.

Breeding rate in wild:

Reasons for decline:

Protective measures already taken:

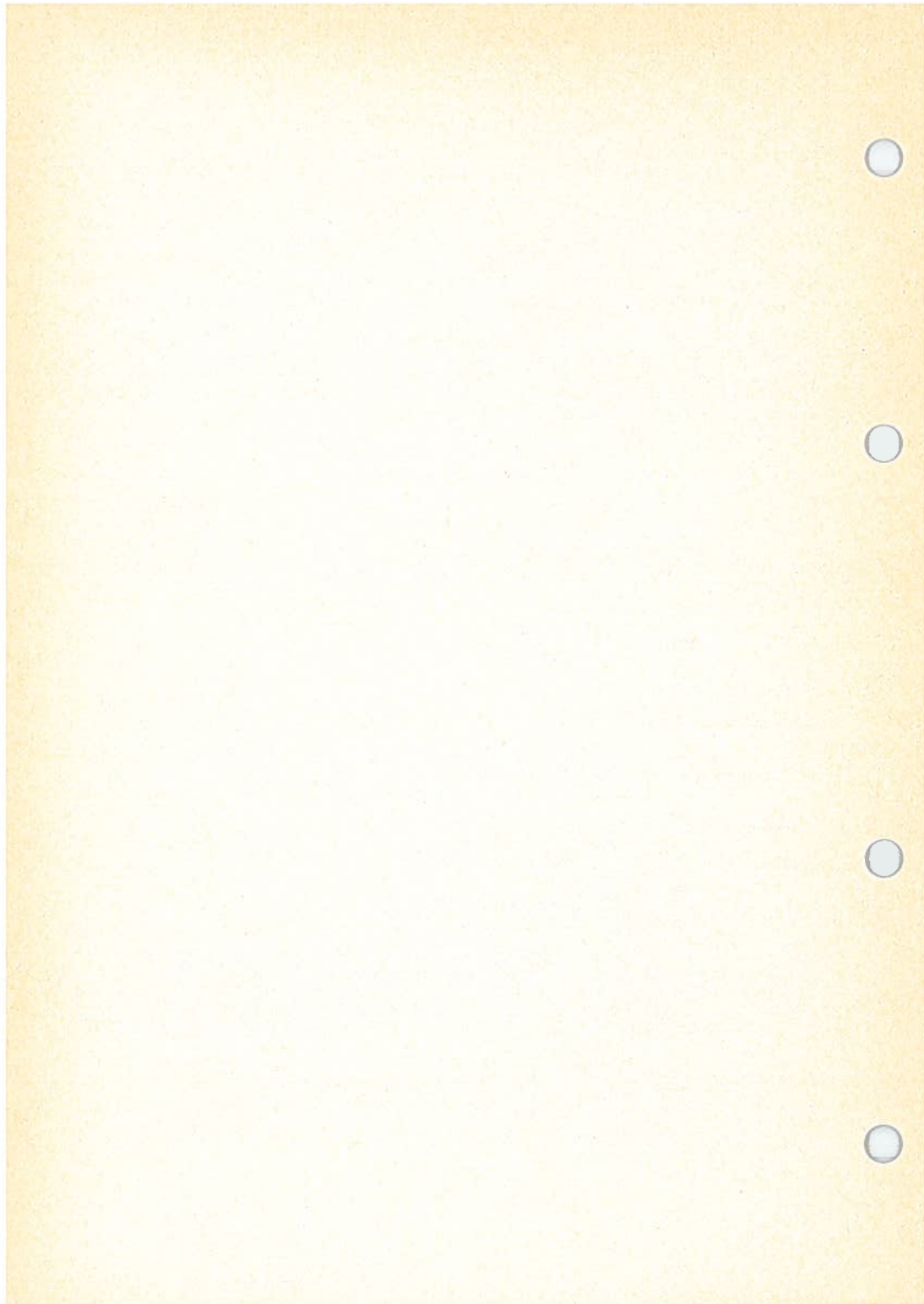
Measures proposed:

Number in captivity: None.

Breeding potential in captivity:

Remarks: "The incisor teeth are remarkable in that they are broad, close set, and arranged in practically a semi-circle, a type unique among carnivores and only approached in certain of the marsupials. The other teeth and the skull are also peculiar and certainly indicate habits and a mode of life different from that of other genera in the family Viverridae." (3:1240)

References: 1. Tate, 1947
2. Ellerman & Morrison-Scott, 1951
3. Walker, 1964



HOSE'S PALM CIVET

Diplogale hosei (Thomas, 1892)

Order CARNIVORA

Family VIVERRIDAE

Distinguishing characteristics: "Uniformly blackish brown above and on the limbs and tail, with a grey patch above the eye and grey on the upper half of the cheeks; the sides of the muzzle, back of the ears, chin, and fore part of throat white, but the hinder part of the throat, the breast, and belly either dusky greyish brown as in the type ♂ or clean white as in two females from the same locality, 3,000-4,000 ft. An example from Kina Balu (Everett) has the belly intermediate in tint." (1:1010)

Present distribution: The single species, D. hosei is known only from Borneo. It seems to be an inhabitant of mountains, as all the records are from elevations of 600 to 1,200 meters." (2:1241)

Former distribution:

Status: "... natural history and habits are practically unknown. Only a few specimens have been collected." (2:1241)

Estimated numbers: Unknown.

Breeding rate in wild:

Reasons for decline:

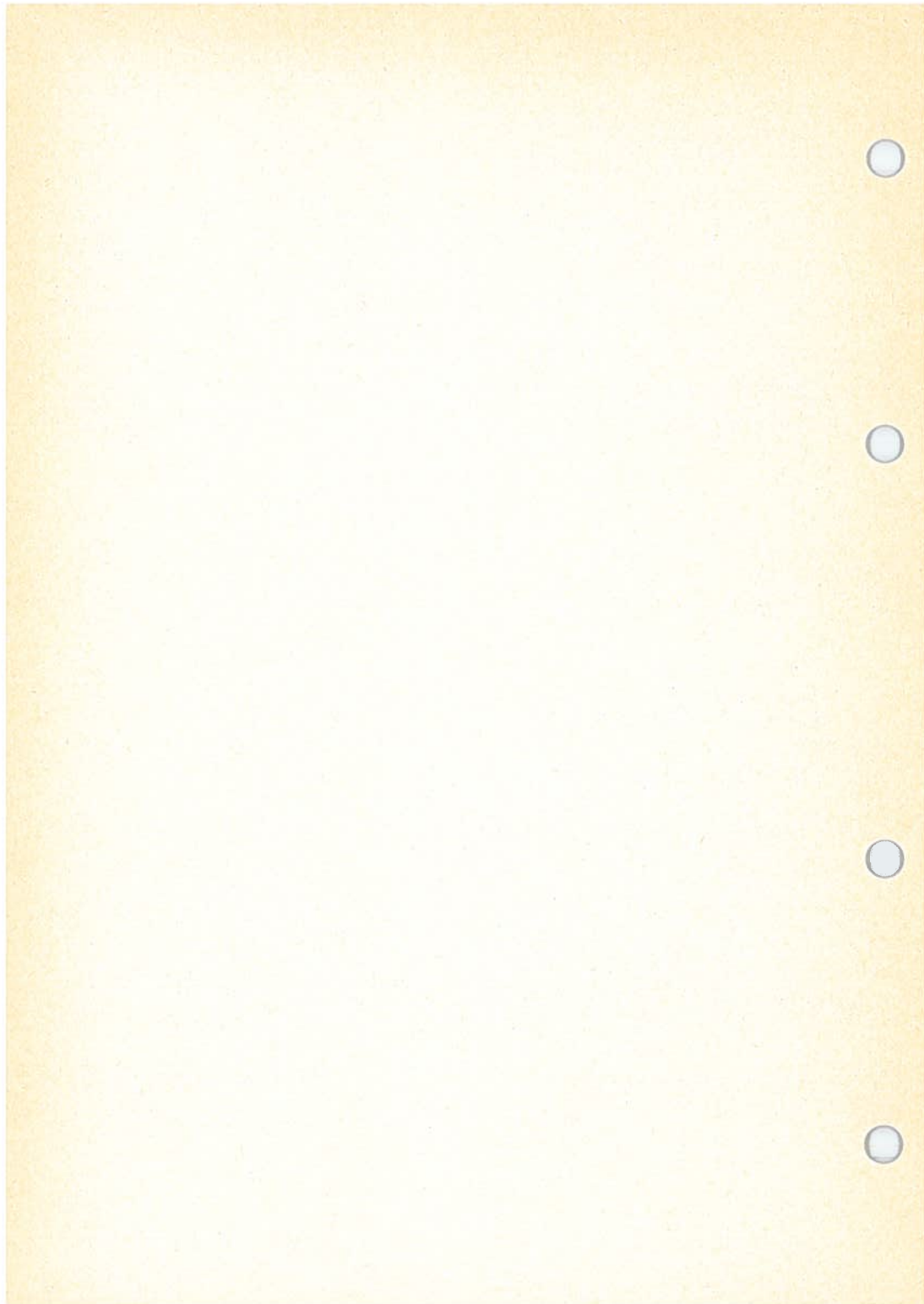
Protective measures already taken:

Measures proposed:

Number in captivity:

Breeding potential in captivity:

References: 1. Pocock, 1933
2. Walker, 1964



OTTER CIVET

Cynogale bennetti Gray, 1837

Order CARNIVORA

Family VIVERRIDAE

Distinguishing characteristics: "Brownish gray, grizzled with white; the underparts are blackish brown. A spot on either side beneath each ear, the lips, and the tip of the tail are whitish. The head is flat and elongate, the muzzle low, broad, and otter-like. The whiskers are well developed; the toes slightly webbed. The length of the head and body is from 24 to 32 inches, of the tail from 5 to 9½ inches, of the hind foot 3¼ to 4¼ inches." (1:182-183)

Present distribution: "Indo-China, Malaya States, Sumatra, Borneo." (2:292)

Former distribution:

Status: "Very rare but not endangered." (4)

Estimated numbers: Unknown.

Breeding rate in wild: "The females possess four mammae. There are records of pregnant females with two and three embryos. Young still with the mother have been noted in May in Borneo." (3:1242)

Reasons for decline: Inapplicable. "It is rare owing to its specialized, limited habit." (4)

Protective measures already taken:

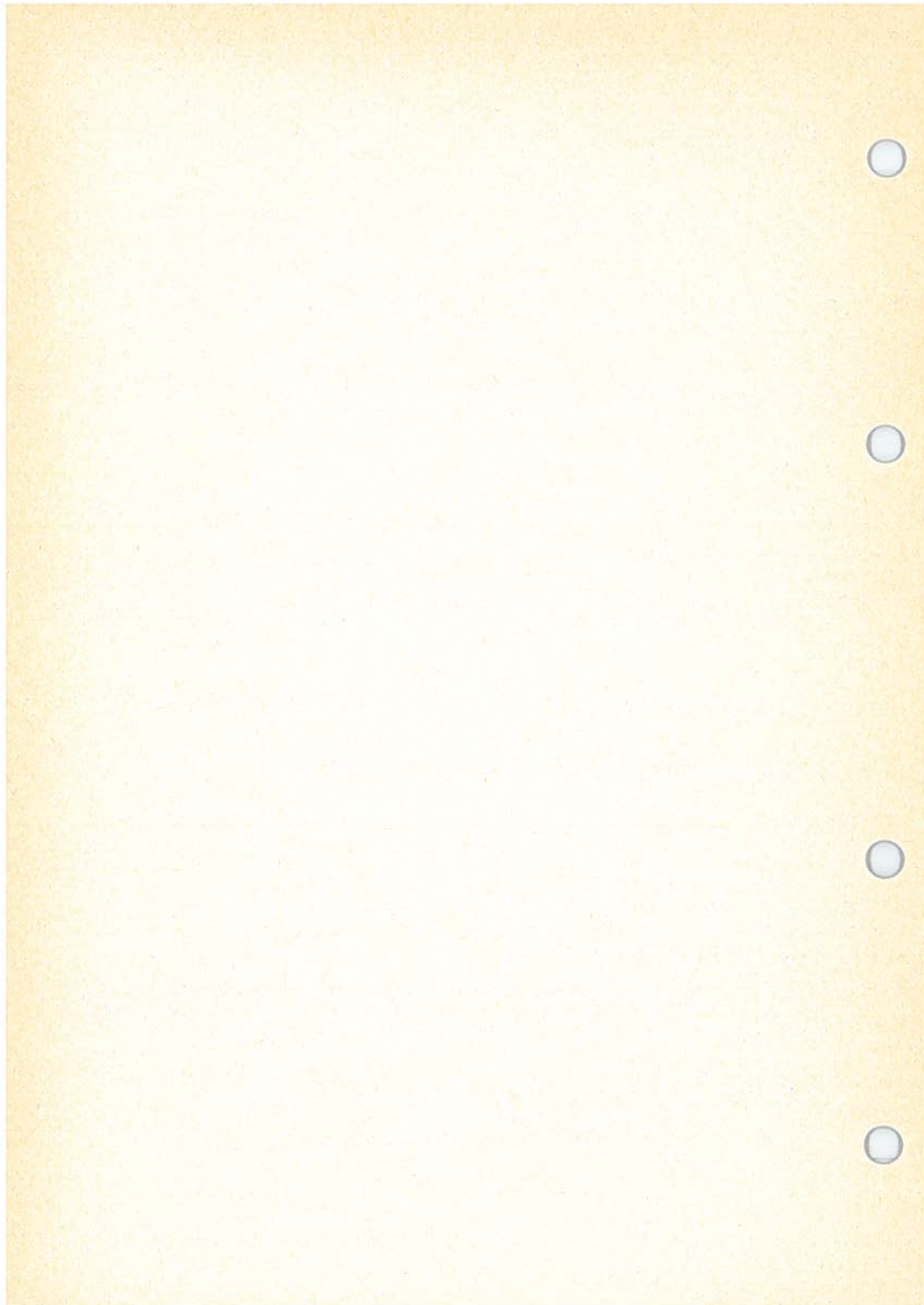
Measures proposed:

Number in captivity: None.

Breeding potential in captivity:

Remarks: "Pocock separated the Indo-Chinese representative [Cynogale lowei], but until more specimens come to hand we prefer to regard this imperfectly-known form as a subspecies." (2:292)

- References:
1. Tate, 1947
 2. Ellerman & Morrison-Scott, 1951
 3. Walker, 1964
 4. B. Harrisson in litt. 2/3/65



BROWN HYAENA

Hyaena brunnea Thunberg, 1820

Order CARNIVORA

Family HYAENIDAE

Distinguishing characteristics: "Size, a little smaller throughout and somewhat more lightly built than the Spotted Hyaena, although the jaws and teeth of the two species appear to be equally powerful. Ears, large, thin, and rather pig-like compared with those of crocuta. ... 'On the back and sides the hair will measure as much as ten inches in length; there is, however, no spinal mane or crest as with the Spotted Hyaena.' - Bryden." (1:158)

Present distribution: TRANSVAAL: "rare in the southern and central districts of the [Kruger] park but are found in appreciable numbers north of the Letaba River, especially in the area along the western boundary." (7:19) "Also occurs on the large and undeveloped farms west of the Kruger Park." (11)

ORANGE FREE STATE: "In the Orange Free State there are still a few brown hyaena in the Clocolan District." (11)

CAPE PROVINCE: "In the vicinity of Kimberley, brown hyaena are found in small numbers on several large ranches. Three specimens have been brought to this Museum during the last year. Probably the greatest number occur on the De Beers Company's estate 'Rooipoort' 40 miles west of the town. Here they are however also rare and very seldom seen. They are not now hunted at all on this estate but elsewhere are trapped or shot whenever they are noticed since they kill domestic stock. Brown hyaena are not uncommon in the Kalahari Gemsbok National Park ... Areas in the Cape Province where the species is probably still present are: (a) the west coast (Namaqualand); (b) large ranches in the districts of Vryburg, Kuruman and Gordonia, bordering on the Bechuanaland Protectorate (which may serve as a reservoir)." (11)

NATAL: Mkuzi Game Reserve: "Mr. Denyer informs me that one of these animals was shot on the Nsumu flats during 1948." (9:47) Shortridge's statement that the species "has never been reported from Natal" (1:154) is inaccurate. (11)

SOUTH WEST AFRICA: Shortridge (1934) stated that the brown hyaena occurred throughout practically the whole territory, including the Namib Desert and was generally plentiful except in those portions of Great Namaqualand where game is scarce and in the Caprivi. (1:153) "This statement is still substantially correct." (11)

BECHUANALAND: "I have the impression, from discussion with local inhabitants, that in the waterless southern parts of Bechuanaland the brown hyaena is the common species and the spotted hyaena is rare or absent." (11)

EAST AFRICA: Although precise information is lacking, it is possible that the species may still occur in parts of East Africa. Bigalke believes "that the brown and the striped hyaenas form a pair of replacing species, their areas of distribution being separated by a gap (in Northern Rhodesia) as are those of many other pairs of related mammal species (Oryx gazella and O. beisa etc.)." This hypothesis appears to be supported by evidence provided by Ansell and Lamprey. The former states that it "does not occur at all in Northern Rhodesia today, nor has it been known there within historical times." (5:249) The latter writes that "the Game Ranger in charge of the Mkomazi Game Reserve told me that he had seen one on the Kenya/Tanganyika border near Lake Jipe about 5 years ago." (12)

Former distribution: "The brown hyaena was probably the only hyaena species found along the coasts of the Cape. Historical research makes it very probable that the species occurred in the districts of Cradock and Uitenhage (Eastern Cape Province) (4:55), and in those of Bredasdorp and Swellendam (Southern Cape). (8:84) Detailed knowledge of its former distribution elsewhere is lacking but it is likely that the brown hyaena was the only species in the southern parts of southern Africa, overlapping the range of the spotted hyaena only from the Orange River (or perhaps further north still) northwards." (11) "... it reaches southern Angola on the west and occurs sporadically in Nyasaland and Mozambique; there have been rare records of its occurrence in Tanganyika Territory (Sclater) and Kenya (Ward) - as far north as Kilimanjaro (Bryden and Lydekker)." (1:154) "It has apparently been recorded from Portuguese East Africa and Southern Rhodesia. Its occurrence in Angola seems very doubtful." (3:142)

Status: "The status of this animal is very difficult indeed to determine. Even where they may be quite plentiful brown hyaenas are very rarely seen and since they are now found mainly in thinly populated or uninhabited areas, records are difficult to come by. One might perhaps hazard the statement that in Parks and Reserves and in uninhabited areas such as the tracts of Crown Land in south-western Bechuanaland, the future of the species is probably assured. However, the small numbers remaining on ranches will probably be exterminated sooner or later in view of the losses they cause among domestic stock." (11)

Estimated numbers: No comprehensive figures. "Less than 200" in the Kruger Park. (7:19)

Breeding rate in wild: "Two to four cubs are born in a litter, the probable average being two or three. Period of gestation (of H. hyaena) three months." - S. Hamilton. (1:158) "I know of no information on the age of sexual maturity or the frequency of litters." (11)

Reasons for decline: "Like other large predators and scavengers, the brown hyaena has suffered at the hands of farmers and ranchers who regarded it as a danger to their livestock. Hunters may also have taken a toll." (11)

Protective measures already taken: "Protected, as are all other species in National Parks and Game Reserves where it occurs." (11)

Measures proposed: None.

Number in captivity: 10 ♂♂ and 8 ♀♀ in 9 zoos. (10:379)

Breeding potential in captivity: Of the above, 2 ♂♂ and 1 ♀ were bred in captivity. (10:379)

- References:
1. Shortridge, 1934
 2. Stevenson-Hamilton, 1947
 3. Ellerman, Morrison-Scott & Hayman, 1953
 4. Skead, 1958
 5. Ansell, 1961
 6. Deane, 1962
 7. Pienaar, 1963
 8. Bateman, 1964
 9. Dixon, 1964
 10. Jarvis, 1964
 11. R.C. Bigalke in litt. 6/3/64
 12. H. Lamprey in litt. 20/4/64

BARBARY HYAENA

Hyaena hyaena barbara Blainville, 1844

Order CARNIVORA

Family HYAENIDAE

Distinguishing characteristics: Distinguished by its average larger teeth, as indicated by pm^4 , associated with a large skull; the coat carrying under-wool in winter." (1:819)

Present distribution: "The Barbary hyaena can be found in Morocco, in the south-west of the Grand Atlas of Agadir region as well as in the area situated to the S.W. of Marrakech, in the Moyen-Atlas (regions of Khénifra, Azrou, Itzer and Ifrane) in the massifs of the Taza hinterland. It also occurs in the Oulmès Mountains, Haroha District as well as in some restricted areas in the eastern part of the country, particularly in the Debdou region. This animal, which is found only in mountainous regions and on the high plateaux, is today completely absent from the Rif Mountains." (5)

Former distribution: "In the past this hyaena was to be found in all the regions already mentioned and very possibly was also widespread over nearly the entire country, not merely in the hills and montane forests as it is today." (5)

Status: "Declining, in some places faster than in others." (4)

Estimated numbers: "It is of course difficult to give exact figures, particularly with regard to the number of animals living in the south of the country: very probably, however, the total does not exceed 400 to 500." (5)

Breeding rate in wild: "Gestation period about 90 days. 3 - 4 young at a time." (4)

Reasons for decline: "This is a retiring animal and its habitat is therefore proportionately reduced as the human population increases. Very probably because of its fierce appearance the Moroccans believe it (wrongly) to be a ferocious animal and accuse it of attacking their sheep and goats. Above all the hyaena is destroyed because this animal plays a certain part in Moroccan black magic. (The hairs from its mane are used as a talisman and the brain is sold because of its supposed beneficial qualities)." (5)

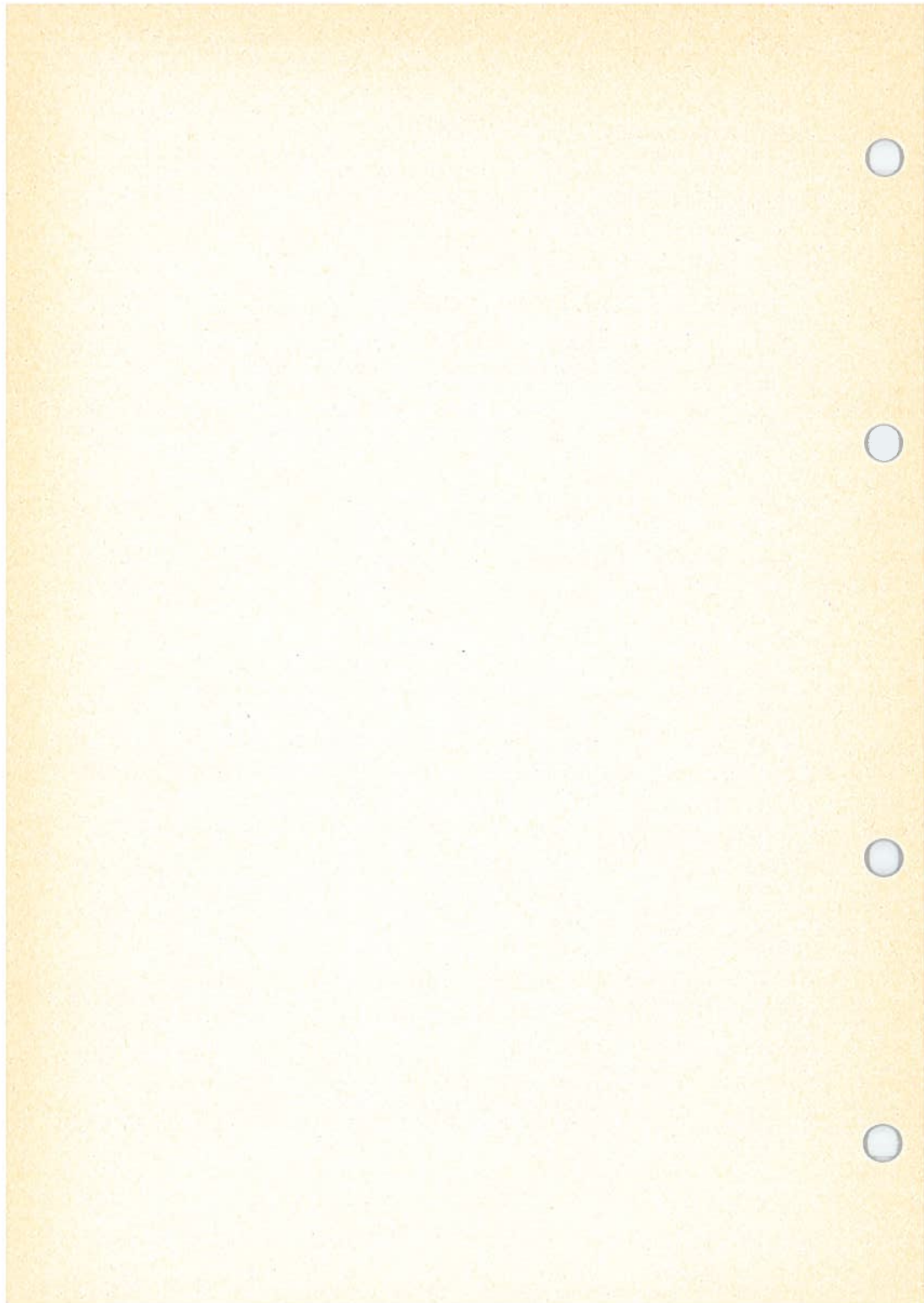
Protective measures already taken: "Protected by hunting legislation. When one is captured the head, or at least the brain, has to be burned in the presence of competent authorities." (4) "Enjoys total protection in Morocco. Since 1955 all hunting or capture of this animal alive or dead has been forbidden." (5)

Measures proposed: "At the legislative level every possible measure of protection has been taken to ensure the maintenance of this species. All that remains to be done is to apply the law effectively, but it is very difficult indeed to prevent its destruction because of the magical qualities attributed to it." (5)

Number in captivity:

Breeding potential in captivity: "Unknown. It is possible that the hyaena may breed quite readily because it can be tamed relatively easily." (5)

- References:
1. Pocock, 1934
 2. Panouse, 1957
 3. Chapuis, 1961
 4. J.B. Panouse in litt. 24/4/64
 5. M. Chapuis in litt. 19/10/64



SPANISH LYNX

Felis lynx pardina Temminck, 1824

Order CARNIVORA

Family FELIDAE

Distinguishing characteristics: "Smaller than the typical lynx, shorter fur, more heavily spotted." (4:186) Miller states that there are two colour-phases. (1:398)

Present distribution: The Sierra de Caro (3 killed in 1953): Las Hurdes (reports of two specimens taken in recent years): Sierra de S. Pedro (reported in 1927 and again in 1930): Sierra de Guadalupe and Motes de Toledo (still abundant. Approximately 40 have been killed since 1950. About half a dozen are killed annually in certain "cotos"): Sierra Morena (widely distributed, but uncommon, all across the Sierra): Marismas (greatly diminished and exterminated in certain "cotos" but still relatively abundant in some places, notably at Donana. 18 were killed in 3 years at Hinojos): a few may exist in the Pyrenees where three zones have been mentioned - Gave d'Aspe, Massif de Néouvielle and the Capcir. (There is however some doubt whether the animal concerned is F.l. lynx or F.l. pardina). (5)

Former distribution: Over the greater part of the Iberian Peninsula. (5)

Status: Rare and decreasing. The Spanish lynx has completely disappeared except in certain large controlled hunting areas or "cotos" in southern Spain. (5)

Estimated numbers: Total population unknown, but there may be several hundred including an estimated 150 - 200 in the Coto Donana. (3:111)

Breeding rate in wild: The rutting season is in January. A single litter annually which varies from 1 - 4 but usually consists of 2 - 3. The young remain in the lair until about four months of age. (3:112-113)

Reasons for decline: "Like so many of the larger carnivores of Europe, it suffers constant persecution, to which its accessible habitat makes it particularly vulnerable. Probably it is already on the way to extinction. (3:111) Widespread depletion of its habitat through deforestation has accelerated the decline. (5)

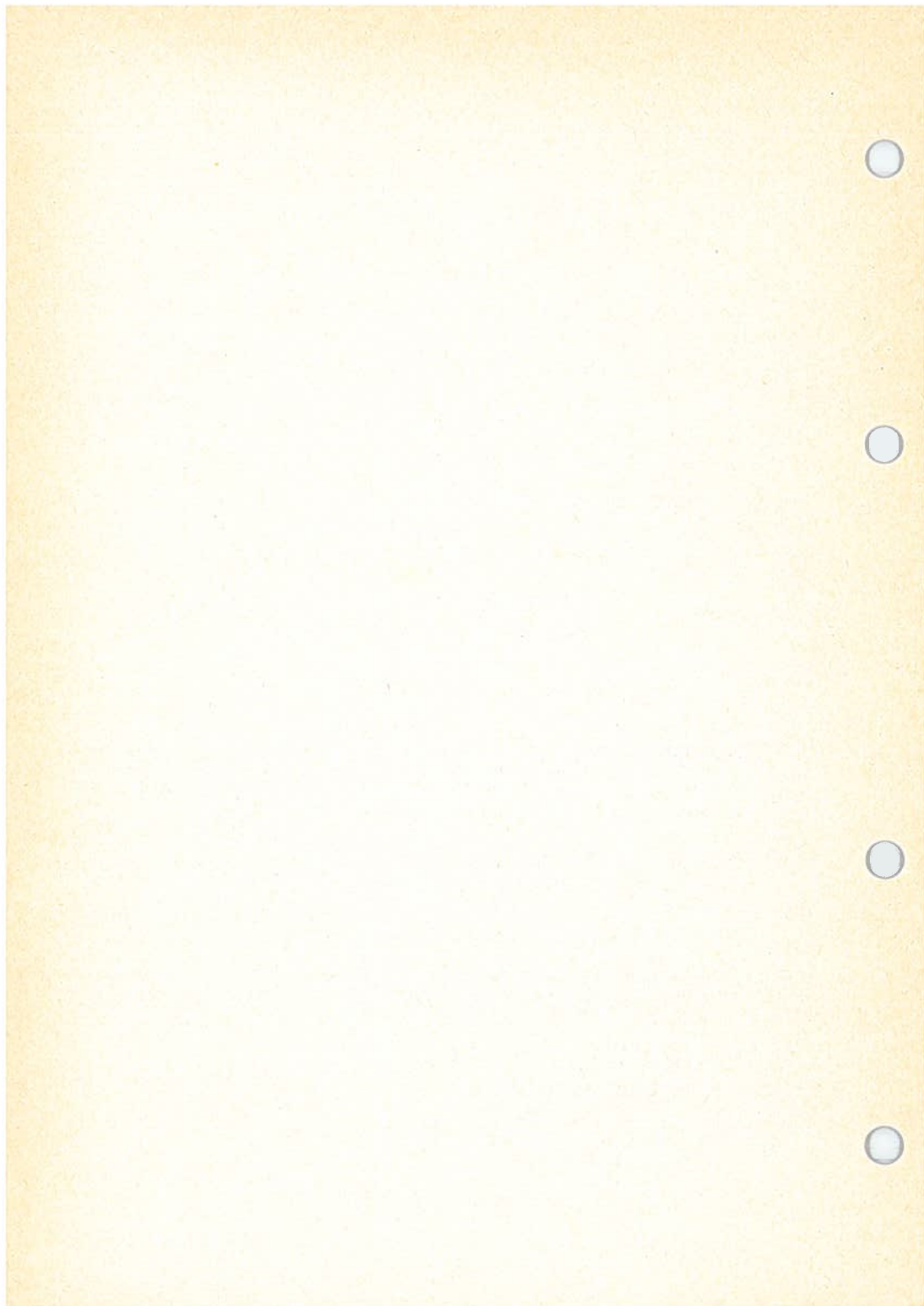
Protective measures already taken: Half the original 130 sq. km. Coto Donana has been purchased by the World Wildlife Fund and declared a reserve of 65. sq. km. In June 1965 the title deeds of the reserve (known as the Coto Palacio de Donana) were formally presented by WWF to the Spanish Government. (IUCN Bulletin No. 16., July/September 1965, p. 4). Partially protected in the remainder of the Coto Donana. (5)

Measures proposed: Legal protection. Exclusion from the list of verminous animals for which there is no close season. Dr. Valverde proposes to undertake an ecological study of the lynx. (5)

Number in captivity:

Breeding potential in captivity:

- References:
1. Miller, 1907
 2. Valverde, 1957
 3. Mountfort, 1958
 4. Burton, 1962
 5. J.A. Valverde in litt. 12/1/63 & 11/4/63



FLORIDA COUGAR

Felis concolor coryi Bangs, 1896

Order CARNIVORA

Family FELIDAE

Distinguishing characteristics: "... a bright-colored animal and smaller than the eastern puma, of a 'rich ferruginous or intense rusty red' above, with smaller feet." (1:240)

Present distribution: Generally found in the Everglades National Park. This is the last stronghold of the species east of the Mississippi River. (5)

Former distribution: "The Florida Peninsula and the adjacent parts of South Georgia, Alabama and Louisiana. ... Panthers formerly were found in somewhat similar country in Arkansas, and True (1889) reports a few killed or seen up to the late eighties, but it is not certain that they were of this race." (1:240-241)

Status: "Populations of this animal may have increased slightly. Several sightings have been reported in the Bear Lake area of the Park and ... along the Park's boundary and Ten-Mile Corner area. It would be expected that cougar should increase with the upward population of the Park's deer herd." (4)

Estimated numbers: "It is estimated that the entire population is probably less than one hundred animals." (5)

Breeding rate in wild: "Pumas probably breed at three years of age; the young are born after a gestation period of 90 - 96 days. The usual number of young is 2 (1 - 6)." (2:956)

Reasons for decline: "Many cougars learn to make an easy living by preying on domestic stock. Where horses are numerous the colts seem to be a favourite prey. .. The crimes of the few have brought down the wrath of the stockmen on the entire species. At every opportunity, therefore, the animals are trailed, brought to bay by dogs, and then shot." (3:272)

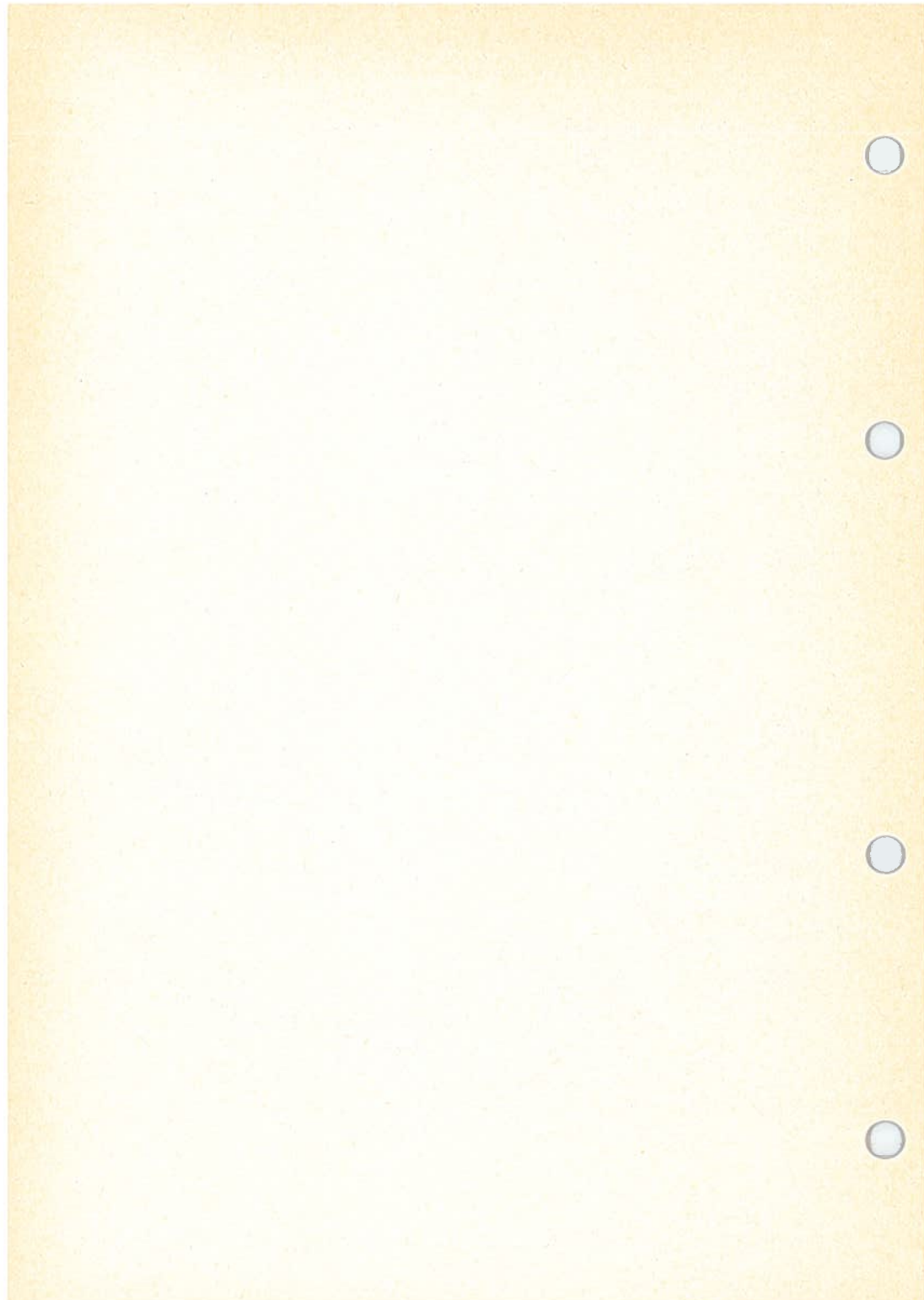
Protective measures already taken: "Receives the complete protection of the Game and Fresh Water Fish Commission and may not be taken or molested at any time." (5)

Measures proposed:

Number in captivity:

Breeding potential in captivity:

- References:
1. Allen, 1942
 2. Hall & Kelson, 1959
 3. Cahalane, 1947
 4. Annual Wildlife Report from Superintendent of Everglades National Park, 23/4/64
 5. James T. Floyd in litt. 2/9/64



ASIATIC LION

Panthera leo persica (Meyer, 1826)

Order CARNIVORA

Family FELIDAE

Distinguishing characteristics: "On the average, the Indian lion has a scantier mane than the African and, curiously enough, ... a fuller coat, a longer tassel of hair at the end of the tail, a more pronounced tuft of hair on the elbow joints and a fuller fringe of hairs on the belly. In size, there is little to choose between the two. ... The largest recorded measurement of an Indian lion is 9 ft. 7 in., of an African lion 10 ft. 7 in." (1:292)

Present distribution: "Since 1884 the range of the Indian lion has been limited to the Gir Forest and its immediate environs" in the southwest of the Kathiawar Peninsula, Gujarat State, India (3:64), an area of approximately 483 sq. miles which is also utilized by more than 7,000 human inhabitants and 57,000 domestic animals. (4:287) Haltenorth considers that a few lion may still occur in south-east Iran. "In Khusistan I spoke to Arabs who distinctly stated that lion were responsible for killing their cattle." (6) "It seems that the last confirmed sighting was that of Champion Jones in 1941, in the Kharki Valley, 40 km. north of Dizful. This region and the neighbouring Bakhtiar Mountains must be ideal for lion: it is covered with scrub, sparsely populated, difficult of access and very wild. If the lion exists in Iran it is there that it must be." (8)

Former distribution: Widely distributed from Asia Minor, Palestine and Arabia to Persia and India. (3:62-64)

Status: The Gir Forest population remains stable and is probably close to the maximum number capable of being supported by the habitat. (7) This figure would increase were it not for the fact that about 100 lions are killed each year, mainly by poisoning.

Estimated numbers: 1950 - 240: 1955 - 290: 1960 - 350: 1961 - 250: 1962 - 250: 1963 - 285: Ratio 1 ♂ - 4 or 5 ♀. (7)

Breeding rate in wild: "Little is known regarding the rate of increase of wild Indian lions. A lion's biological potential is high." (3:67)

Reasons for decline: The retreat of the lion before the advance of civilisation was accentuated by the introduction of modern fire-arms and the presence of military personnel who hunted extensively for sport. The greatest immediate threat arises from excessive numbers of domestic live-stock which by overgrazing are destroying the habitat and driving out the wild ungulates on which the lions depend for food; resulting in increasing conflict between man and the lion. (3:65-66)

Protective measures already taken: The protection of the Gir Forest has gone far to ensure the immediate survival of the Asiatic lion. Three Gir lions were introduced into Chandraprabha Sanctuary in Uttar Pradesh in 1957. (2:356) They have now increased to 7 and are expected to increase to 11 early in 1964. (7)

Measures proposed: Talbot considers that "at the present rate of attrition the Gir should only last another 20 years ..." therefore the future of the Asiatic lion would appear to depend either on giving the Gir Forest sanctuary status or on reintroducing the lions into other existing sanctuaries. The first requirement is an ecological study of the Gir Forest - a proposal approved by IUCN and the Indian Board for Wildlife in 1956, but not yet implemented. (3:82)

Number in captivity: 13 ♂♂ and 17 ♀♀ in 9 zoos. (5:380)

Breeding potential in captivity: Good. Of the above, 8 ♂♂ and 10 ♀♀ were born in captivity. (5:380)

- References:
1. Harper, 1945
 2. Gee, 1958
 3. Talbot, 1960
 4. Ullrich, 1962
 5. Jarvis, 1965
 6. Th. Haltenorth in litt. 28/2/62
 7. E.P. Gee in litt. 10/12/63
 8. X. Misonne in litt. 12/5/64

CASPIAN TIGER

Panthera tigris virgata (Illiger, 1815)

Order CARNIVORA

Family FELIDAE

Distinguishing characteristics: "The Caspian race is 'generally a medium sized or smallish tiger with a thick longish winter coat, dark in colour, with numerous, close-set stripes showing a marked tendency to brownness on the whole or parts of the body.' Length of male, about 10 feet 8 inches; of female, about 8 feet 6 inches. (Pocock, 1929, pp. 522,540)." (2:306)

Present distribution: "Transcaucasia, through Northern Persia to Northern Afghanistan to the Aral Sea and Lake Balkhash in Russian Turkestan." (3:318)
Within this range the present position appears to be as follows:-

U.S.S.R.: There are occasional reports of tigers entering the USSR from Iran and Afghanistan. Novikov, for example, cites several relatively recent reports of tigers which have crossed into extreme southeastern Azerbaydzhan and southern Turkmenia from Iran, as well as a 1948 report of one on the lower reaches of the Ili River (which flows into Lake Balkhash). Bannikov states that since the end of 1964 tigers have been known to occur in the Talysh Mountains, Lenkoran District, but it is certain that these specimens originated from Iran. (12) It seems unlikely, however, that there is any longer a resident population of P.t. virgata in the Soviet sector of its range.

IRAN: "It occurs along the Caspian littoral - Mazandéran, Gilan, Gorgan, but not in the western portions of this region." (10) "In 1956 I saw traces (a few weeks old) of tiger near Bandari-Gaz. A skin seller from Gorgan told me that he had tiger skins only rarely now, but that before the war he had several each winter. I know that in 1956 a hunter shot a tiger at Dacht, to the east of Gumbat-i-Kabus, in a region not of humid forest but rather of high brush." (9)

AFGHANISTAN: "The tiger is undoubtedly found south of the eastern part of Turkmenia and Tadzhikistan in North Afghanistan, but it is not precisely known how far it ranges ..." (1:246) "In this country, as in Persia, the species appears to be restricted to the northern part." (2:307)

Former distribution: The range formerly extended to the Irtysh basin and the Altai. (4) "At the beginning of the century it was still found in Armenia and one specimen was even captured at Tiflis. Since then it has retreated towards the East." (9) "Formerly distributed throughout the entire Caspian region, both on the reed-covered coastal plain and in the forests on the northern slopes of the Elburz Mountains, especially in Gilan, Mazandéran and western Khorassan provinces." (6:84-85)

Status: "The latest information about P.t. virgata which I have received from Dr. Sludskii is that the tiger no longer exists in Soviet Central Asia. The last tiger in Syr Dar'ya was killed in 1933. They were seen there occasionally until 1948. On the Ili River (on the southern shore of Lake Balkhash) the last tiger was killed in 1935, but they were still seen there until 1948. In Amu Dar'ya the last time one was captured was in 1947, but there were rumours of tigers there until 1951. Since then nothing has been

heard about the tiger, in spite of the presence of thousands of musk-rat hunters throughout the year. The most recent information about the tiger along the River Vakhsh in Tadzhikistan was received in 1953." (11) Lavrenko and Kirikov also state that the tiger is extinct in Amu Dar'ya delta. (5:64) "The Caspian tiger still occurs, but is rare, in the northwest of Iran but is more frequent in Afghanistan." (8) "Declining rapidly and in urgent need of protection ... The rare specimens that are occasionally seen in northern Iran and on the Amu Dar'ya may perhaps have migrated from Afghanistan." (9)

Estimated numbers: Trense estimated the population at "between 50 and 80." (6:85) Perhaps 15-20 in Iran. (10) No estimates exist for Afghanistan.

Breeding rate in wild: "Reproduces once every 2 or 3 years. No particular breeding season: gestation period 105 days: normally 2 to 4 (occasionally 5 or 6) cubs per litter: dens are usually rock fissures, caves, dense reed beds and occasionally cavities left by uprooted trees: cubs remain with the mother for 2 to 3 years: sexual maturity is reached at 4 years of age: tigers live from 15-17 years or, according to some reports, up to 50 years." (4)

Reasons for decline: Referring to the Transcaspien region, S.L. Bilkevich (1924) states: "Tigers occurred to the end of the last century in Turkmenia, particularly along the Murgab and Tedzhen rivers. Increased hunting of tigers by military hunting squads, as well as the cleaning up and plowing of the dense tugai forests as a result of the promotion of cotton growing in these river regions compelled the tigers to leave for more favourable areas." (1:245) In Central Asia the tiger inhabited dense reed thickets in the river valleys and the burning of these thickets as a result of steppe fires was a contributory factor in Kazakhstan. (4) The same reason appears applicable to the Caspian littoral: "The reeds, which once provided shelter for the tiger, have now been eliminated through development of rice, tea and cotton cultivation." (6:85) "The reasons for the decline of the tiger in the Caspian region are not clear. In the forests its principal prey species is the boar and although large numbers of boars were killed in 1945-46 they have been fairly abundant since 1953-55 and the leopard is still common throughout the forests. Possible factors are: (a) irrational destruction of the magnificent Caspian forest; (b) the paucity of prey species in the forest (the boar excepted) - deer exist only at the higher elevations and are themselves declining; (c) effective control of the incidence of malaria on the Caspian coast which has resulted in a more active human population and consequently an increasing number of hunters." (9)

Protective measures already taken: The killing of tigers is now prohibited in the USSR. (4) In Iran the tiger has been on the protected list for seven years. (10)

Measures proposed: "In my opinion the only means of ensuring the survival of the tiger would be complete prohibition of hunting in Iran and Afghanistan, as well as measures to maintain adequate numbers of wild boars, the tiger's principal prey species." (11)

Number in captivity:

Breeding potential in captivity: A female in Moscow Zoo produced litters in two consecutive years and became pregnant again in the third, but failed to suckle the cubs. (4)

References:

1. Ognev, 1935
2. Harper, 1945
3. Ellerman & Morrison-Scott, 1951
4. Sludskii, 1953
5. Lavrenko & Kirikov, 1958
6. Trense, 1959
7. Novikov, 1962
8. M. Thonon in litt. 19/3/64
9. X. Misonne in litt. 12/5/64
10. Eskandar Firouz in litt. 3/8/64
11. Ivan A. Sokolov in litt. 18/3/65
12. V. Mazak in litt. 13/4/65