WILDLIFE TRADE MONITORING UNIT

Traffic Bulletin

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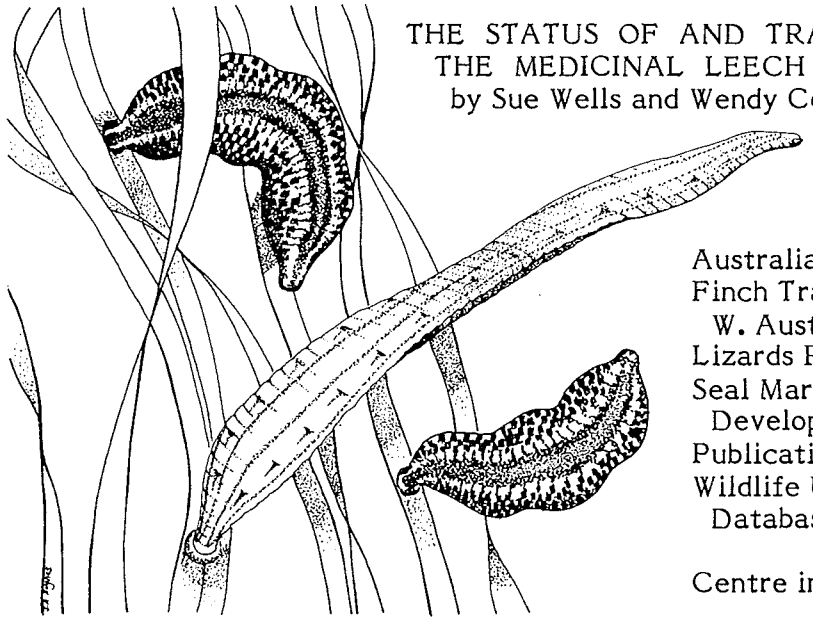

Illustration by Sarah Anne Hughes

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95 Parties to CITES . . .

Singapore acceded to CITES on 30 November 1986, (effective 28 February 1987), thus becoming the 94th Party to the Convention.

Singapore has entered reservations on three crocodilian taxa: Saltwater or Estuarine Crocodile Crocodylus porosus, New Guinea Crocodile Crocodylus novaeguineae novaeguineae and the South American Spectacled Caiman Caiman crocodilus crocodilus, of which only C. porosus occurs wild in Singapore. This species is listed in CITES Appendix I, although the populations of Australia, Indonesia and Papua New Guinea are in Appendix II, while C.n. novaeguineae and C.c. crocodilus are both in Appendix II. Singapore has several crocodilian farms, most of whose stock comprises C. porosus, although there are reports that some C.n. novaeguineae and C.c. crocodilus may also be raised on farms. Captive-breeding has been attempted, but it is understood that most of the stock derives from the wild. Singapore acts as a major entrepot for trade in crocodile products, particularly between South East Asian countries and Japan.

The Dominican Republic acceded to CITES on 17 December 1986 (effective 17 March 1987), becoming the 95th Party to CITES.

. . . United Arab Emirates Withdraws

On 27 January 1987, the United Arab Emirates (UAE) deposited its instrument of denunciation of CITES. This shall become effective twelve months later.

UAE has been a a Party to CITES since July 1975. In November 1985, the CITES Secretariat raised the serious problem of the large volume of trade in violation of the Convention involving the UAE, and that despite the Secretariat's attempts to persuade the Government of UAE to take the necessary action, the situation had continued to deteriorate. Because of this, Parties were urged to take all possible measures to prohibit and prevent trade in CITES specimens with UAE (see Traffic Bulletin VII(5):63).

Source: CITES Secretariat

CITES Financial Amendment in Force

The 'financial amendment' to CITES is about to enter into force. This important change to the Convention text allows the making of financial provisions which provide a legal basis to keep the Convention functioning.

Adopted on 22 June 1979, at the first Extraordinary Meeting of the Conference of the Parties, the amendment changes Article XI, paragraph 3 (a) to read: "At meetings, whether regular or extraordinary, the Parties shall review the implementation of the present Convention and may: (a) make such provisions as may be necessary to enable the Secretariat to carry out its duties, and adopt financial provisions;" etc.

Such amendments to the Convention only enter into force when they have been ratified by two-thirds of the states party to CITES at the time of the adoption.

Indonesia deposited its instrument of acceptance of the financial amendment on 12 February 1987. It was the thirty-fourth state to accept of the fifty-one which were Party when the amendment was originally adopted. Thus, the amendment enters into force on 13 April 1987 for the thirty-four states plus ten others which have joined since June 1979 and have accepted the amendment. This represents an important step in stability. Any state joining CITES from 13.4.87 will be automatically bound by the financial amendment.

Source: CITES Secretariat

Appendix III Listings for Honduras

The Republic of Honduras has submitted to the CITES Secretariat the following list of species for inclusion in Appendix III. These species are protected under Resolucion No. 209-82, issued on 26 April 1982.

Mexican Tree Porcupine	Sphiggurus mexicanus
Spotted Paca	Agouti paca
C. American Agouti	Dasyprocta punctata
Coati	Nasua nasua
Kinkajou	Potos flavus
Tayra	Eira barbara
Muscovy duck	Cairina moschata
Black-bellied Whistling Duck	Dendrocygna autumnalis
Fulvous Whistling Duck	Dendrocygna bicolor
King Vulture	Sarcoramphus papa
Great Curassow	Crax rubra
Plain Chachalaca	Ortalis vetula
Crested Guan	Penelope purpurascens
Atlantic Coral Snake	Micrurus diastema
Black-banded Coral Snake	Micrurus nigrocinctus
Cantil	Agkistrodon bilineatus
Barba Amarilla	Bothrops asper
Horned Hog-nosed Pit Viper	Bothrops nasuta
Jumping Viper	Bothrops nummifera
-	Bothrops ophryomegas
Horned Palm Viper	Bothrops schlegeli
Tropical Rattlesnake	Crotalus durissus

Guyana Halts Wildlife Exports

The Guyanese Management Authority has stopped the commercial exports of wild fauna effective as of 28 February 1987, until further notice. This measure was taken in order to allow work on a quota system and revision of local wildlife laws and regulations.

The ban will not affect the export of pets or flora.

Source: CITES Secretariat

Traffic in France

On 16 January 1987, the TRAFFIC Committee, which oversees the operation and development of the TRAFFIC Network, approved the establishment of a new TRAFFIC office, in France. TRAFFIC (France) is based in Paris, in the offices of WWF-France under the direction of Mlle. Gwénola le Serrec (see back page).

France became a Party to CITES on 9 August 1978. A large proportion of its trade consists of reptile skins and products, felidae skins, ivory, and live birds, particularly parrots. The priorities for TRAFFIC (France) include carrying out a survey of the effective implementation of CITES in France and the analysis of available data, and the compilation of a list of wildlife dealers. A leaflet will also be published about the sale of certain wildlife souvenirs, exotic pets, and explaining the role of CITES.

Congo Gorillas to UK

The UK Government has decided to allow John Aspinall of Howletts Zoo to import three wild-caught Western Lowland Gorillas, Gorilla g. gorilla from the People's Republic of the Congo, thus reversing their earlier rejection of his application. The new decision, taken personally by the Minister of State, William Waldegrave, goes against the advice of, amongst others, the UK Scientific Authority, the CITES Secretariat, the UK Anthropoid Ape Advisory Panel and Dr Alexander Harcourt, a Cambridge University zoologist who has spent many years studying gorillas in the wild.

The animals come from a stock held by Mme LeRoy, in Congo, of gorillas reportedly orphaned by hunters killing the adults for food. Opposition to their import to the UK was largely based on the argument that as long as there is some form of market for such animals, they will continue to appear. By showing a repeated willingness to accept wild gorillas, importing countries provide a stimulus to the trade and therefore contribute to the drain on wild populations. The UK Government justifies the import by claiming that it is a "one-off" situation but this ignores the realities of the situation in Africa.

Mme LeRoy may not be receiving any financial recompense, but it seems unlikely that no money for the gorillas has ever exchanged hands anywhere in their trip from the Congo forest to a private British zoo. According to the Daily Mail (2 March 1987), one of the gorillas was offered for sale to Mme LeRoy's intermediary for US$450 and was eventually bought by the intermediary for US$30. As long as any money at all is on offer, or believed to be, and remembering that US$30 can be a great deal to a Congolese hunter, it is impossible to eliminate financial gain as a motive for obtaining the gorilla babies. The question of whether the adults would have been killed anyway for food becomes moot.

Mr Aspinall has argued that if he were not allowed to import the gorillas, they would die or be sold to inexpert institutions. In fact, whilst facilities at Howletts are very good, another solution had been offered. In July 1986, the American Association of Zoological Parks and Aquariums (AAZPA) submitted to the Congo Government a proposal that offered clear benefits to wild gorillas. The proposal, budgeted at US$167 000, offered to find suitable homes in US zoos for the orphans, which would be under the control of AAZPA's Species Survival Plan for gorillas but would remain the property of the Congo Government. It also included surveys of montane forest in the Congo and training of Congolese conservation personnel. This offer represented a compromise, responding to concerns for the welfare of the orphans whilst ensuring that gorilla conservation would also benefit. It is unclear why this offer was ignored.

Opposition to the UK import stressed not only the stimulation of trade in an Appendix I species, but also that there were already enough gorillas in the UK to sustain captive populations provided that zoos co-operate in the exchange of animals and the distribution of progeny. At its annual meeting in February 1987, a majority of the UK Anthropoid Ape Advisory Panel agreed that the gorillas were unnecessary and this was stated to the UK CITES Management Authority by the Chairman of the Panel. The Panel recommended that, if the import were allowed, specific conditions be imposed whereby the gorillas would remain the property of the Congo Government, and be subject to the national and international zoo agreements established to promote the development of co-operative captive-breeding programmes for the species. Although the UK Management Authority has stipulated that the gorillas be jointly owned by the Congo Government and the Howletts and Port Lympne Foundation, no further conditions have been imposed with regard to the participation of the animals in any captive breeding programmes nor does Howletts co-operate in such arrangements.

Alexandra Dixon

1987 Ivory Export Quotas

The CITES Secretariat has received the following ivory export quotas for 1987 from countries with an African Elephant Loxodonta africana population:

Angola	0	Mali	0
Benin	0	Mauritania	0
Botswana	0	Mozambique	200
Burkina Faso	0	Niger	0
Cameroon	0	Nigeria	0
C. African Rep.	0	Rwanda	0
Chad	320	Senegal	0
Congo	3784*	Sierra Leone	0
Equatorial Guinea	0	Somalia	0
Ethiopia	0	South Africa	14000
Gabon	2600	Sudan	#21500
Ghana	0	Tanzania	16000
Guinea	0	Togo	0
Ivory Coast	0	Uganda	#156
Kenya	°2000	Zaire	0
Liberia	0	Zambia	8500
Malawi	370**	Zimbabwe	9000

* includes stocks of 2584 ° includes stocks of 800
\# existing stock **includes 350 polished tusks

Parties are reminded that African countries with elephant populations have a zero quota until and unless the Secretariat informs otherwise. Imports of raw ivory should be accepted from producer states only where the date on the export permit is for a year in which the producer state has a quota.

USA Rescinds Singapore Ban

The US ban on all wildlife imports from Singapore, imposed on 25 September 1986 (see Traffic Bulletin, VIII(3):33), has been rescinded.

A notice in the US Federal Register dated 30 December 1986 and effective from 1 January 1987, stated that the decision had been taken because of "positive" actions by the Singapore Government in respect of wildlife trade since the ban on all fish and wildlife imports was imposed.

Following protests in Singapore over the hardships the ban would bring to innocent aquarium fish breeders and exporters, and a warning that the matter might be raised by the Trade and Industry Ministry as being in violation of the General Agreement on Tariffs and Trade, the USA partially lifted the embargo, to exempt aquarium fish, on 9 October. The ban on other wildlife imports remained, however, until Singapore complied with CITES and relevant US regulations.

Source: Straits Times, 1.1.87

Rhino Horns Stolen in Bophuthatswana

Between mid-December 1986 and the end of January 1987, fifty-four rhino horns were stolen from locked steel trunks in the strong-room at Pilanesberg National Park, Bophuthatswana, Southern Africa. The total weight of the haul, all from White Rhino Ceratotherium simum, was 150 kg. Each horn bears a white painted number between 1 and 74, but they are otherwise not identifiable. Within Southern Africa police investigations are continuing, however it is believed that attempts will be made to smuggle the horns, possibly to the Far East.

Source: Bophuthatswana National Parks Board

EEC Import Restrictions

Through Article 10.1.(b) of EEC Council Regulation (No. 3626/82), relating to the application of CITES within the European Community, import of the following is prohibited from 23 October 1986.

These measures do not affect the actions taken by certain countries to prohibit, completely or in part, the exportation of specimens of species belonging to their fauna. A known current export ban is indicated by underlining of the relevant country below.

Import of the following species is prohibited, whatever their country of origin (all known countries of origin are shown in square brackets):

FELIDAE

Felis geoffroyi . . . . . [AR,BO,BR,CL,PY,UY]
Geoffroy's Cat

Felis pardalis . . . . . [AR*,BO,BR,BZ,CO,CR*,EC,GF,GT,GY,HN,MX,NI*,PA*,PE,PY*,SR,SV,TT,US,VE]
Ocelot

Felis tigrina . . . . . [AR,BR,CO,CR*,EC,GF,GY,PY,SR,VE]
Little Spotted Cat

Felis wiedii. . . . . [AR,BO,BR,BZ,CO,CR,EC,GF,GT,GY,HN*,MX,NI*,PA,PE,PY,SR,SV*,US,UY,VE]
Margay

ANATIDAE

Anas bernieri . . . . . [MG]
Madagascar Teal

CRACIDAE

Crax rubra . . . . . [BZ,CO,CR,EC,GT,HN,MX,NI,PA,SV]
Great Curassow

Penelopina nigra . . . . . [MX,GT,HN,NI,SV]
Highland Guan

PSITTACIDAE

Agapornis nigrigenis . . . . . [NA,ZM,ZW]
Black-cheeked Lovebird

Agapornis swinderniana . . . . . [CF,CG,CI,CM,GA,GH,LR,UG,ZR]
Black-collared Lovebird

Amazona agilis . . . . . [JM]
Black-billed Amazon

Amazona collaria . . . . . [JM]
Yellow-billed Amazon

Amazona dufresniana . . . . . [BR*,GF,GY,SR,VE]
Blue-cheeked Amazon

Amazona ochrocephala . . . . . [BO,BR,CO,EC,PE]
Yellow-crowned Amazon - (ban on all subspecies except A. o. ochrocephala and A. o. panamensis.)

Amazona oratrix . . . . . [BZ,MX]
Yellow-headed Amazon

Amazona ventralis . . . . . [DO,HT]
Hispaniolan Amazon

Amazona viridigenalis . . . . . [MX]
Green-cheeked Amazon

Anodorhynchus hyacinthinus . . . [BO,BR,PY]
Hyacinth Macaw

Ara maracana . . . . . [AR,BR,PY]
Illiger's Macaw

Ara militaris . . . . . [AR,BO,CO,EC,GT,MX,PE,VE]
Military Macaw

Aratinga auricapilla . . . . . [BR]
Golden-capped Conure

Aratinga euops . . . . . [CU]
Cuban Conure

Bolborhynchus ferrugineifrons . [CO]
Rufous-fronted Parakeet

Cacatua galerita . . . . . [AU,ID,PG]
Sulphur-crested Cockatoo

Charmosyna amabilis . . . . . [FJ]
Red-throated Lorikeet

Eunymphicus cornutus . . . . . [NC]
Horned Parakeet

Forpus xanthops . . . . . [PE]
Yellow-faced Parrotlet

Hapalopsittaca amazonina . . . . [CO,EC,PE,VE]
Rusty-faced Parrot

Hapalopsittaca melanotis . . . . [BO,PE]
Black-winged Parrot

Leptosittaca branickii . . . . . [CO,EC,PE]
Golden-plumed Conure

Loriculus exilis . . . . . [ID]
Green Hanging Parrot

Lorius tibialis # . . . . . (known from one specimen in Calcutta market)
Blue-thighed Lory

Pionus seniloides . . . . . [CO,EC,PE,VE]
White-headed Parrot

Pionus tumultuosus . . . . . [BD,PE]
Plum-crowned Parrot

Poicephalus crassus . . . . . [CF,CM,SD,TD]
Niam Niam Parrot

Probosciger aterrimus . . . . . [AU,ID,PG]
Palm Cockatoo

Prosopeia personata . . . . . [FJ]
Masked Shining Parrot

Psittaculirostris salvadorii . . [ID]
Salvadori's Fig Parrot

Psittrichas fulgidus . . . . . [ID,PG]
Pesquet's Parrot

Pyrrhura albipectus . . . . . [EC]
White-necked Conure

Pyrrhura calliptera . . . . . [CO]
Brown-breasted Conure

Pyrrhura hypoxantha # . . . . . [BR]
Yellow-sided Conure

Pyrrhura leucotis . . . . . [BR,VE]
White-eared Conure

Pyrrhura perlata . . . . . [BR]
Pearly Conure

Pyrrhura rhodocephala . . . . . [VE]
Rose-crowned Conure

Pyrrhura rhodogaster . . . . . [BR]
Crimson-bellied Conure

Tanygnathus heterurus # . . . . (known only from skins of unknown origin)
Rufous-tailed Parrot

Trichoglossus rubiginosus . . . [FM]
Ponapé Lory

Triclaria malachitacea . . . . . [BR]
Purple-bellied Parrot

Vini australis . . . . . [AS,FJ,NU,TO,WF,WS]
Blue-crowned Lory

Vini kuhlii . . . . . [PF]
Kuhl's Lory

Vini peruviana . . . . . [CK,PF]
Tahitian Lory

Vini stepheni . . . . . [PN]
Stephen's Lory

Vini ultramarina . . . . . [PF]
Ultramarine Lory

Import of the following species is prohibited from the specified countries of origin; the countries of origin not covered by the ban are listed in square brackets.

Agapornis fischeri . . . . . BI,RW,KE [TZ]
Fischer's Lovebird

Agapornis lilianae . . . . . MZ,TZ,ZW [MW,ZM],
Nyasa Lovebird

Agapornis personata . . . . . KE [TZ]
Masked Lovebird

Agapornis pullaria . . . . . AO,ET,KE,LR,NG,TD,TZ [BI,CF,CG,CI,CM,ET,GA,GH,GN,GQ,RW,SD,SL,ST,TG,UG,ZR]
Red-faced Lovebird

Agapornis roseicollis Peach-faced Lovebird	BW,ZA [AO,NA]
Amazona amazonica Orange-winged Amazon	BO,EC,PE [BR,CO, GF,GY,SR,TT,VE]
Amazona farinosa Mealy Amazon	BZ,HN,MX [BO,BR, CO,CR,EC,GF,GT,GY, NI,PA,PE,SR,VE]
Amazona tucumana Tucuman Amazon	BO [AR]
Aprosmictus erythropterus Red-winged Parrot	ID,PG [AU],
Ara ararauna Blue and Yellow Macaw	GF,PA,PE,TT [BO, BR,CO,EC,GY,SR, VE]
Ara chloroptera Green-winged Macaw	AR,GF,PA,PE,SR [BO,BR,CO,EC,GY, PY,VE]
Ara couloni Blue-headed Macaw	BO [PE]
Ara nobilis Red-shouldered Macaw	BO [BR,GY,PE,SR, VE]
Ara severa Chestnut-fronted Macaw	EC,GY,PA [BO,BR, CO,GF,PE,SR,VE]
Aratinga acuticaudata Blue-crowned Conure	UY [AR,BO,BR,CO, PY,VE]
Aratinga aurea Peach-fronted Conure	AR,PY [BO,BR,PE, SR]
Aratinga erythrogenys Red-masked Conure	EC [PE]
Aratinga solstitialis Sun Conure	GF,GY,SR,VE [BR]
Brotogeris pyrrhopterus Grey-cheeked Parakeet	PE [EC]
Cyanoliseus patagonus Patagonian Conure	CL,UY [AR]
Deroptyus accipitrinus Hawk-headed Parrot	BR,PE [CO,EC,GF, GY,SR,VE]
Eclectus roratus Eclectus Parrot	AU,ID [PG,SB]
Nannopsittaca panychlora Tepui Parrotlet	GY [VE]
Pionites leucogaster White-bellied Caique	EC? [BO,BR,PE]
Pionus senilis White-capped Parrot	GT,HN,NI,PA [BZ, CR,MX]
Poicephalus robustus Cape Parrot	CI,GH,GM,GW,NA,NG, SN,SZ,TG,ZA [AO, BI,CG,GA,ML,MW,MZ, RW,TZ,UG,ZM,ZR,ZW]
Poicephalus rufiventris Red-bellied Parrot	TZ [ET,KE,SO]
Poicephalus senegalus Senegal Parrot	BF,ML,MR,NE,TD [BJ,CI,CM,GH,GM, GN,GW,NG,SN,TG]
Psittacus erithacus Grey Parrot	BI,BJ,CF,GH,GQ,ML, RW,ST*,TG,TZ [AO, CG,CI,CM,GA,GN,GW, KE,LR,NG,SL,UG,ZR]
Pyrrhura picta Painted Conure	BO,CO [BR,EC,GF, GY,PE,SR,VE]

Analysis of the EEC 1984 trade data shows that skins of all four listed Felidae spp. were imported in that year (a total of 59 533, including 46% from Paraguay from where none has been legally exported since 1975) and 18 species of birds - all parrots. A total of 5490 birds of these 18 species were imported (4.8% of the total parrot imports), 6.4% of these originated in countries without wild populations and 24% from countries that prohibited export at that time.

* Appendix I populations only in these countries.
# No longer considered valid species (Bock, W.J. and Farrand, J., 1980, American Mus. Novit. 2703:25)

KEY FOR COUNTRY CODES

AO	Angola[1]	ML	Mali[1]
AR	Argentina[2]	MR	Mauritania[1]
AS	American Samoa	MW	Malawi[1]
AU	Australia[3]	MX	Mexico[5]
BF	Burkina Faso[1]	MZ	Mozambique[1]
BI	Burundi	NA	Namibia[15]
BJ	Benin[1]	NC	New Caledonia
BO	Bolivia[4]	NE	Niger[1]
BR	Brazil[5]	NG	Nigeria[1]
BW	Botswana[1]	NI	Nicaragua[5]
BZ	Belize[5]	NU	Niue
CF	C. African Rep.[1]	PA	Panama[5]
CG	Congo[1]	PE	Peru[16]
CI	Côte d'Ivoire[1]	PF	French Polynesia
CK	Cook Islands	PG	Papua New Guinea[17]
CL	Chile[5]	PN	Pitcairn I.
CM	Cameroon[1]	PY	Paraguay[5]
CO	Colombia[5]	RW	Rwanda[1]
CR	Costa Rica[5]	SB	Solomon Is.[18]
CU	Cuba[6]	SD	Sudan[1]
DO	Dominican Rep.[7]	SL	Sierra Leone[1]
EC	Ecuador[5]	SN	Senegal[1]
ET	Ethiopia[1]	SO	Somalia[1]
FJ	Fiji[8]	SR	Suriname[5]
FM	Fed. States of Micronesia	ST	Sao Tome & Principe[1]
GA	Gabon[1]	SV	El Salvador[19]
GF	French Guiana[9]	SZ	Swaziland[1]
GH	Ghana[1]	TD	Chad
GM	Gambia[1]	TG	Togo[1]
GN	Guinea	TO	Tonga[20]
GQ	Equat. Guinea[1]	TT	Trinidad & Tobago[21]
GT	Guatemala[10]	TZ	Tanzania[1]
GU	Guam	UG	Uganda[1]
GW	Guinea-Bissau[1]	UY	Uruguay[5]
GY	Guyana[11]	VE	Venezuela[5]
HN	Honduras[12]	WF	Wallis & Futuna Is.
ID	Indonesia[13]	WS	Samoa
JM	Jamaica[14]	ZA	South Africa[1]
KE	Kenya[1]	ZM	Zambia[1]
LR	Liberia[1]	ZR	Zaire[1]
MG	Madagascar[1]	ZW	Zimbabwe[1]

1. African Wildlife Laws. IUCN Environmental Policy & Law, Occasional Paper, No. 3.
2. CITES Notif., No. 412, 28 November 1986.
3. Wildlife Protection (Regulation of Exports and Imports) Act 1982.
4. CITES Notif., No. 401, 11 August 1986.
5. Latin American Wildlife Trade Laws. WWF(US).
6. Arancel de Aduana de la Rep. de Cuba (1968).
7. Decreto de Veda No. 230, October 1978.
8. The Birds and Game Protection Ordinance No. 20 of 1923.
9. Arrêté of 15 May 1986 (France).
10. CITES Notif., No. 386, 7 May 1986.
11. N.C. McAndrew (Min. of Agriculture) to O. Menghi (CITES Secretariat), 19 Dec. 1986.
12. CITES Notif., No. 415, 28 November 1986.
13. Traffic Bulletin 8(2):29-31.
14. The Wildlife Protection Law, No. 46 of 1944.
15. Traffic Bulletin, 5(5/6):51.
16. CITES Notif., No. 389, 7 May 1986.
17. Collecting, export, import, research and filming involving wildlife in Papua New Guinea. Wildlife Publication No. 81/2.
18. Wild Birds Protection Regulation 1914.
19. CITES Notif., No. 398, 4 July 1986.
20. Birds and Fish Preservation Act 1915.
21. Conservation of Wild Life Ordinance 1958.

Exploiting the Musk Deer for its Musk

by Michael J. B. Green

Introduction

Musk is a secretion of the preputial gland of the male musk deer Moschus spp. Not only is it one of the oldest and most esteemed raw materials used in perfumery, owing to its fixative and scent attributes, but also pharmacological properties have been ascribed to musk for a very long time. Traditionally, the musk deer is killed in order to remove the musk gland or 'pod' as it is known in the trade.

Musk deer are distributed sporadically throughout the forested, mountainous parts of eastern Asia, from just north of the Arctic circle southwards to China and the Himalayan region (Green, 1986). At least three species are recognised: Siberian Musk Deer M. moschiferus in eastern USSR, Korea and northern China; Dwarf Musk Deer M. berezovskii in southern China and northern Viet Nam; and Alpine, or Himalayan, Musk Deer M. chrysogaster in western China and the Himalayan region (after Grubb, 1982).

Severe hunting pressures, exacerbated by extensive habitat destruction, are responsible for the widespread decline of the musk deer throughout much of its Palaearctic distribution. This decline, documented in the case of the Himalayan population (Green, 1986), is responsible for the increasing scarcity of musk, the price of which on the international market has progressively risen from a quarter of its weight in gold in the 1850s to three times its weight in gold by the 1970s, making musk one of the most valuable animal products in the world (Green, 1986). Currently, the status of the Himalayan Musk Deer is vulnerable (Anon., 1974a) and the Himalayan Moschus population (Afghanistan, Bhutan, Burma, India, Nepal, Pakistan) is listed in CITES Appendix I, prohibiting commercial trade. By contrast, musk deer from Chinese and Soviet populations are listed in CITES Appendix II, allowing trade subject to strict regulation to avoid over-exploitation.

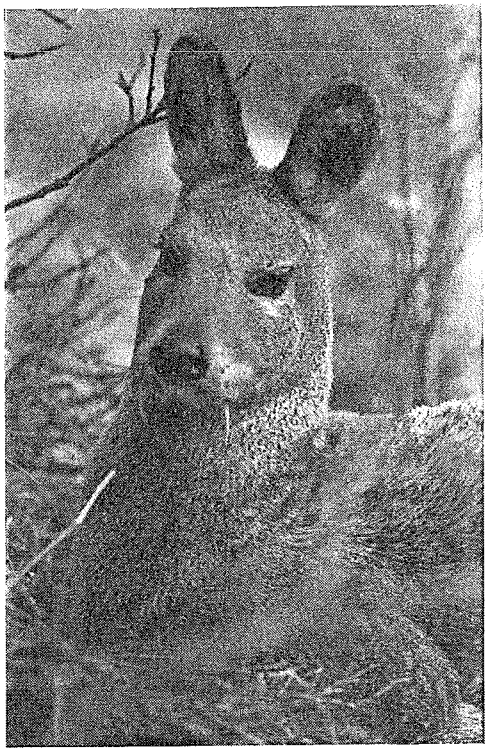
As long ago as 1919, Clements (cited in Parry, 1925) suggested that musk deer should be reared in semi-captivity for the production of musk which, as subsequently noted by Flerov (1952) and others, can be extracted via the external orifice of the gland without killing the animal. This technique has been adopted in China where, in the face of diminishing supplies of musk from wild animals, domestication of the musk deer began in 1958 as part of a national programme to utilise wildlife resources in traditional materia medica (Zhang et al., 1979; Zhang, 1983). In India, small experimental farms have since been established in Himachal Pradesh at Kufri (Jain, 1980), and in Uttar Pradesh at Kanchula Kharak and Meroli (Green, 1985), but none of these is run on a commercial basis. In Australia, Europe, New Zealand and the USA, there is considerable interest in farming musk deer but, currently, there is little or no captive stock, even in zoos.

The purpose of this article is to review what has been achieved to date, with particular attention to the Chinese experience, and examine possible alternatives to farming.

Farming in China

Farms have been established in the Chinese provinces of Anhui (Anon., 1975; Hung, 1975), Qinghai (Zheng, 1980), Quangxi Autonomous Region (Xiang, 1974), Shaanxi (Zhang et al., 1979), Shanxi (Zhou, 1965) and Sichuan (Anon., 1974b). Zhang et al. (1979) provide a detailed account of Chinese experience in farming musk deer.

M. berezovskii has proved easier to domesticate than M. chrysogaster (sifanicus). Most success with M. berezovskii has been achieved in Sichuan Province



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Male musk deer, readily distinguished from females by the presence of canine tusks, are greatly sought after for their musk, which currently retails at c.US$40 000 per kg.

where several of the state-run farms were visited by a Nepalese delegation in 1979 (Bista et al., 1979). Some of these farms are used for breeding purposes while others house only males for the extraction of musk. Musk deer were kept in large enclosures, each containing ten to fifteen animals with a ratio of between three and seven females to one male, but at the Quang Xian extraction farm males were confined to small wooden cages of less than a cubic metre.

At Ma Er Kang, China's first musk deer farm, musk is extracted from males towards the end of each winter (Anon., 1974b). The musk is removed using a spatula, which is inserted into the musk sac, via the external orifice, while the animal is manually restrained.

Males secrete musk from an age of twelve to eighteen months onwards, peak production occurring prior to the autumn rut. Most musk is produced by males of between three and eight years of age (Bista et al., 1979). Males in captivity produce little musk by the age of fourteen years but the ability to produce the secretion still persists at twenty years of age (Zhang, 1983). About 18 g (10 g dry weight) of musk is harvested annually from each captive male (Anon., 1974b, 1975), an amount which is comparable to yields obtained from males killed in the wild (see Green, in press).

Sichuan, where there are now twenty-one commune-run farms, in addition to four state-owned farms begun in 1958 (Bista et al., 1979), reputedly produces half of the nation's musk according to Chinese newspaper reports. About 1000 musk deer were raised on farms in Sichuan in 1984, which suggests that currently some 2000 or more animals are farmed in China. Even if the amount of musk produced from farmed animals were known, which it is not, this would not be representative of the scale of the musk trade because most Chinese musk originates from animals hunted in the wild. Although the musk deer is nationally protected in China, the demand for musk is so great that commune leaders, who apparently can authorise the collection of musk, actively encourage hunting by supplying free ammunition. The commune at A'mne Machin in Qinghai Province, for

example, sells 100 000 yuan of musk from wild animals each year (Rowell, 1983). This represents an annual kill of at least 250 males. Although not much is known about the scale of the musk trade within China, from 1981 to 1985 215-300 kg of Chinese musk were annually imported by Japan, the world's largest consumer of musk (Green, 1986), according to Japanese trade statistics. This, representing over fifty per cent of the international trade in musk, must originate from wild animals as it must be well in excess of whatever is being produced from farms.

Difficulties of captive breeding

The musk deer has proved to be relatively difficult to breed in captivity. During initial attempts by the Chinese to build up captive stocks with animals from the wild, the mortality rate was sixty to seventy per cent, with considerable numbers of musk deer dying from gastroenteritis largely as a result of poor husbandry techniques (Bista et al., 1979). Newly-captured fawns, which are preferred to adults because they are easier to tame, are particularly prone to such infection unless preventative measures are taken (Zheng, 1980). The other commonly fatal disease, to which young are very susceptible, is pneumonia (Bista et al., 1979). A similar high mortality rate is evident elsewhere. Of thirty-two records of musk deer born in zoos worldwide between 1959 and 1980, fifteen (forty-seven per cent) failed to survive (Green, 1985).

In China, the survival rate of young has improved from fifty per cent to over ninety per cent at Foziling Farm in Anhui (Anon., 1975), and at Ma Er Kang Farm in Sichuan it averaged over seventy-four per cent (N=336) during the period 1959-1973 (Anon., 1974b). Apparently, in Sichuan's state-run farms, advances in domesticating and breeding musk deer were sufficient for the capture of wild animals to be discontinued after 1965 (Bista et al., 1979). Such progress cannot be widespread in China as most captive stocks need to be replenished with animals from the wild (Green and Taylor, 1986).

The musk deer's solitary habit (see Green, 1985) is a considerable handicap to intensive husbandry practices. Males are probably territorial and cannot be raised together in small confined spaces without risk of injury from fighting. The practice, in at least one Chinese farm, of isolating males within small cages little bigger than themselves, cannot be conducive to their welfare. Such treatment, if widespread, might even be partly responsible for the reputedly inferior quality of musk from farmed animals.

Economics of farming versus hunting

Present information concerning Chinese efforts to harvest musk from domesticated animals is inadequate for purposes of assessing the economic viability of farming.

State-run farms are subsidised by the Government and known to run at a loss due to the high maintenance costs (Bista et al., 1979). Another factor may be the reputed inferior quality of musk from captive males.

Even with improvements in rearing and breeding musk deer through better husbandry, there remains the problem of raising males at high densities without having to resort to practices that are detrimental to the animals' welfare. Furthermore, as musk deer are easily stressed, extraction of musk needs to be performed under anaesthesia or using tame animals.

By contrast, hunting is highly profitable and can play a significant part in the economy of rural communities, particularly those at subsistence level in remote areas where alternative sources of livelihood are meagre. About 50 g of musk, which on average represents that obtained from two males (Green, in press), provides a family living in a remote region of Nepal with a year's income (Blower, 1974). In western Nepal, musk from the winter hunting season of 1976/77 provided the sixty families of Dalphu Village with twenty per cent of their annual cash requirements (Jackson, 1979). Similarly, in western China, the sale of musk provides the 800-member commune at A'mne Machin with twenty-six per cent of its annual income (Rowell, 1983).

Sustainable utilisation - an alternative approach

The problems and costs of maintaining musk deer in captivity could be avoided by harvesting musk from free-ranging animals on the basis of either capturing live animals, then releasing them after extracting the musk (Green, 1978, 1986), or culling them as is practised in the Soviet Union (Bannikov et al., 1980). A major constraint to the former is developing a suitable method of capture (see Green, 1985). Rural development schemes to harvest musk from wild or ranched animals would provide local communities with the motivation to protect not only the musk deer but also its habitat (Green, 1986; Green and Taylor, 1986).

As pure musk is virtually unobtainable, due to the widespread and centuries-old practice of adulteration (see Green, in press), some simple method of checking its purity needs to be developed. In Japan, Mikuni and Company, the leading importer of musk, measures the odorous component (muscone) of musk by gas-liquid chromatography, but a less sophisticated technique needs to be developed for ready application in the field.

In view of the highly lucrative nature of the musk trade, commercial operations to harvest musk from captive or wild animals must be accompanied by the proper protection of the musk deer in conservation areas (Green, 1986). At present, wild populations of musk deer in China are under extremely heavy pressure from hunting and, most likely, farming provides an infrastructure whereby musk obtained from poached animals is readily traded with risks of apprehension minimised.

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Proposed 'Roo Quotas for 1987

Australian states or territories which wish to utilise kangaroos commercially are required to have a management programme approved each year by the Federal Government (see Traffic Bulletin VI(5):73-82). The Australian Capital Territory, Northern Territory and Victoria do not have a commercial cull. Management programmes for the other states have not yet been approved, but provisional quotas for 1987 were announced on 17 December 1986, and are as follows:

	1986	1987
Western Australia		
Macropus rufus	180000	200000
Macropus fuliginosus	50000	45000
Macropus robustus	10000	-
New South Wales		
Macropus rufus	313000	313000
Macropus fuliginosus	-	161000
Macropus giganteus	264000*	103000
Queensland		
Macropus rufus	300000	375000
Macropus giganteus	970000*	1300000
Macropus robustus	70000	70000
Macropus parryi	40000	10000
South Australia		
Macropus rufus	180000	180000
Macropus fuliginosus	34600	30900
Macropus robustus	12000	16500
Tasmania		
Thylogale billardieri	110000	-
Macropus rufogriseus	140000	-

* combined total for M. fuliginosus/M. giganteus.

No quota has been set for Tasmania pending further discussions.

S. Australian and W. Australian management programmes were declared approved on 19 February 1987 (Commonwealth of Aust. Gazette No. S 32, 24 February 1987) effectively confirming above quotas for those states.

Source: TRAFFIC (Australia)

Tanzania Cracks Down on Ivory Trade

From 1 December 1986, all raw/polished ivory in Tanzania will be sold by the Government by tender and all exports will require CITES export permits. Export permits for ivory hunting trophies will continue to be issued.

In addition, a ban has been imposed on the carving of ivory and, as from 31 December 1986, there will be no commercial exports of worked ivory. Worked ivory acquired as personal effects prior to 1 January 1987 will remain eligible for export.

Source: CITES Secretariat

Ivory Returned to Congo

A shipment of 713 ivory tusks, weighing 3.8 tonnes, seized after being illegally exported to France from Congo more than two years ago, has recently been returned to Brazzaville.

The tusks had been kept in storage at Roissy Airport since the shipment arrived with a forged permit.

Source: Ministry of the Environment (France)

Bonytongue Fish Seized in Hong Kong

In 1986, up to November, the Hong Kong Government successfully prosecuted seven offenders for the illegal import and possession of 174 specimens of Asian Bonytongue Scleropages formosus (CITES Appendix I). The fish were seized under the Animals and Plants (Protection of Endangered Species) Ordinance through which CITES is implemented. The specimens had been imported from Singapore, Malaysia and Indonesia.

Source: Hong Kong Agriculture and Fisheries Dept.

CITES Appendix Amendment Proposals

In accordance with the provisions of Article XV, para. 1(a), of CITES, the following proposals for amendment of Appendices I and II of the Convention, have been communicated to the Secretariat by Parties (listed below in brackets). These proposals will be considered at the sixth meeting of the Conference of the Parties to the Convention, to be held in Ottawa, Canada, from 12 to 24 July 1987.

MAMMALIA		
Phalanger lullulae		
Woodlark Island Cuscus	incl. App. I	(PG)
Myrmecobius fasciatus		
Numbat	incl. App. I	(AU)
Burramys parvus		
Mountain Pygmy-possum	del. App. II	(CH*)
Pteropus insularis		
Truk Flying-fox	incl. App. II	(US)
Pteropus macrotis		
Big-eared Flying-fox	incl. App. II	(US)
Pteropus mariannus		
Marianas Flying-fox	incl. App. I	(US)
Pteropus molossinus		
Ponape Flying-fox	incl. App. II	(US)
Pteropus phaeocephalus		
Mortlock Flying-fox	incl. App. II	(US)
Pteropus pilosus		
Large Palau Flying-fox	incl. App. II	(US)
Pteropus samoensis		
Samoan Flying-fox	incl. App. II	(US)
Pteropus tokudae		
Guam Flying-fox	incl. App. I	(US)
Pteropus tonganus		
Insular Flying-fox	incl. App. II	(US)
Erinaceus frontalis		
South African Hedgehog	del. App. II	(CH*)
Nesolagus netscheri		
Sumatran Short-eared Rabbit	del. App. II	(CH*)
Lariscus hosei		
Four-striped Ground Squirrel	del. App. II	(CH*)
Dipodomys phillipsii phillipsii		
Phillips' Kangaroo Rat	del. App. II	(CH*)
Notomys spp.		
Hopping Mice	del. App. II	AU
Pseudomys fumeus		
Smoky Mouse	del. App. I	(CH*) (AU)
Pseudomys shortridgei		
Heath Rat	del. App. II	(AU)
Dusicyon gymnocercus		
Pampas Fox	incl. App. II	(UY)
Cynogale bennettii		
Otter-civet	del. App. II	(CH*)
Eupleres goudotii		
Falanouc	del. App. II	(CH*)
Felis yagouaroundi		
Jaguarundi-N/C American pop. in lieu of subspecies F.y. cacomitli, F.y. fossata, F.y. panamensis, F. y. tolteca	incl. App. I	(CH*)
Panthera tigris altaica		
Siberian Tiger	tr.App. II-I	(CH*)
Odobenus rosmarus		
Walrus	incl. App. II	(NL)
Trichechus senegalensis	del. App. II	(CH*)
African Manatee	or tr.App. II-I	
Catagonus wagneri		
Chacoan Peccary	incl. App. I	(PY)
Tayassu spp.		
Peccaries	incl. App. II	(PE)
Vicugna vicugna		
Vicuna	tr.App. I-II	(PE[1]) (CL[2])
Pudu mephistophiles		
Northern Pudu	del. App. II	(CH*)

AVES		
Balaeniceps rex		
Shoebill	incl. App. I	(NL)
Mycteria cinerea		
Milky Stork	incl. App. I	(MY)
Eudocimus ruber	incl. App. I	(FR)
Scarlet Ibis	incl. App. II	(SR)
Anas bernieri		
Madagascar Teal	del. App. II	(CH*)
Megapodius freycinet abbotti		
Abbott's Scrubfowl	del. App. II	(CH*)
Megapodius freycinet nicobariensis		
Nicobar Scrubfowl	del. App. II	(CH*)
Tetrao mlokosiewiczi		
Caucasian Black Grouse	del. App. II	(CH*)
Francolinus ochropectus		
Djibouti Francolin	del. App. II	(CH*)
Francolinus swierstrai		
Swierstra's Francolin	del. App. II	(CH*)
Rheinartia ocellata		
Crested Argus Pheasant	incl. App. I	(MY)
Pedionomus torquatus		
Plains-wanderer	del. App. II	(CH*)
Otididae spp.		
Bustards	incl. App. II	(GB)
Numenius minutus		
Little Curlew	del. App. II	(CH*)
Larus brunnicephalus		
Brown-headed Gull	del. App. II	(CH*)
Probosciger aterrimus		
Palm Cockatoo	tr.App. II-I	(PG)
Anodorhynchus hyacinthinus		
Hyacinth Macaw	tr.App. II-I	(BR)
Ara militaris		
Military Macaw	tr.App. II-I	(AR)
Trochilidae spp.		
Hummingbirds	incl. App. II	(EC)
Picus squamatus flavirostris		
Western Scaly-bellied Woodpecker	del. App. II	(CH*)
Pitta brachyura nympha		
Fairy Pitta	del. App. II	(CH*)
Pseudochelidon sirintarae		
White-eyed River Martin	del. App. II	(CH*)
Psophodes nigrogularis		
Western Whipbird	del. App. II	(AU) (CH*)
Niltava ruecki		
Rueck's Blue Flycatcher	del. App. II	(CH*)
Gubernatrix cristata		
Yellow Cardinal	incl. App. I	(AR)
Paroaria capitata		
Yellow-billed Cardinal	incl. App. II	(AR)
Paroaria coronata		
Red-crested Cardinal	incl. App. II	(AR)
Carduelis yarrellii		
Yellow-faced Siskin	del. App. II	(CH*)
Meliphaga cassidix		
Helmeted Honeyeater	del. App. I	(AU)
Emblema oculata		
Red-eared Firetail	del. App. II	(CH*)
REPTILIA		
Clemmys muhlenbergi		
Bog Turtle	del. App. II	(CH*)
Chelonia mydas		
Green Turtle		
Europa & Tromelin popns.	tr.App. I-II[3]	(FR)
ID popn.	tr.App. I-II	(ID)
Eretmochelys imbricata		
Hawksbill Turtle - ID popn.	tr.App.I-II	(ID)
Crocodylus cataphractus		
Sharp-nosed Crocodile (CG popn. with annual export quota of 600)	tr.App. I-II	(CG)

Crocodylus niloticus	tr.App. II-I	(CH)
Nile Crocodile	maintain App. II with quotas for popns. of countries shown: (BW):2000; (CG)1000;(CM):100;(KE):5000;(MG):5500;(MW):800; (MZ):1000;(SD):5000;(TZ):1000;(ZM):2000	
Crocodylus porosus (ID popn.)	tr.App. II-I	(CH)
Saltwater Crocodile "	no quota	(ID)
Osteolaemus tetraspis (CG popn.)		
W. African Dwarf Crocodile annual export quota of 1000	tr.App. I-II	(CG)
Paradelma orientalis		
Queensland Snake-lizard	del. App. II	(CH*) (AU*)
Phrynosoma coronatum blainvillei		
San Diego Horned Lizard	del. App. II	(CH*)
Podarcis pityusensis		
Ibiza Wall Lizard	incl. App. II	(ES)
Podarcis lilfordi		
Lilford's Wall Lizard	incl. App. II	(ES)
Gallotia aff. simonyi		
Hierro Giant Lizard	incl. App. I	(ES)
Boa constrictor occidentalis		
Argentine Boa Constrictor	tr.App. II-I	(UY)
Thamnophis couchi hammondi		
Two-striped Garter Snake	del. App. II	(CH*)
Vipera ursinii		
Ursini's Viper	incl. App. I	(FR/IT)
AMPHIBIA		
Ambystoma lermaense		
Lake Lerma Salamander	del. App. II	(CH*)
Dendrobatidae spp.		
Poison-arrow Frogs	incl. App. II	(SR)
Dendrobates altobueyensis		
Golden Poison-arrow Frog	incl. App. I	(NL)
Phyllobates spp.		
Poison-arrow Frogs	incl. App. II	(NL)
Mantella aurantiaca		
Golden Frog	incl. App. I	(NL)
Dyscophus antongili		
Tomato Frog	incl. App. I	(NL)
PISCES		
Latimeria chalumnae		
Coelacanth	del. App. II	(CH*)
Scleropages formosus		
Asian Bonytongue - ID pop.	tr.App. I-II	(ID)
Salmo chrysogaster		
Mexican Golden Trout	del. App. II	(CH*)
Stenodus leucichthys leucichthys		
White Salmon	del. App. II	(CH*)
Caecobarbus geertsi		
African Blind Barb Fish	del. App. II	(CH*)
Plagopterus argentissimus		
Woundfin	del. App. II	(CH*)
Ptychocheilus lucius		
Colorado River Squawfish	del. App. II	(CH*)
Cynolebias constanciae	del. App. II	(CH*)
Cynolebias marmoratus	del. App. II	(CH*)
Cynolebias minimus	del. App. II	(CH*)
Cynolebias opalescens	del. App. II	(CH*)
Cynolebias splendens	del. App. II	(CH*)
Xiphophorus couchianus		
Monterrey Platyfish	del. App. II	(CH*)
INSECTA		
Bhutanitis spp.		
Bhutanitis Swallowtails	incl. App. II	(GB)
Ornithoptera alexandrae		
Queen Alexandra's Birdwing	tr.App. II-I	(GB)
Papilio chikae		
Luzon Swallowtail	incl. App. I	(GB)
Papilio homerus		
Homerus Swallowtail	incl. App. I	(GB)
Papilio hospiton		
Corsican Swallowtail	incl. App. I	(GB)
Teinopalpus spp.		
Kaiser-I-Hinds	incl. App. II	(GB)
ANNELIDA		
Hirudo medicinalis		
Medicinal Leech	incl. App. II	(GB)
MOLLUSCA		
Choromytilus chorus		
Choro	del. App. II	(CH*)
Cyprogenia aberti		
Pearly Mussels	del. App. II	(CH*)
Epioblasma torulosa rangiana	del. App. II	(CH*)
Fusconaia subrotunda	del. App. II	(CH*)
Lampsilis brevicula	del. App. II	(CH*)
Lexingtonia dolabelloides	del. App. II	(CH*)
Pleurobema clava	del. App. II	(CH*)
Paryphanta spp.	del. App. II	(CH*)
Coahuilix hubbsi	del. App. II	(CH*)
Cochliopina milleri	del. App. II	(CH*)
Durangonella coahuilae	del. App. II	(CH*)
Mexipyrgus carranzae	del. App. II	(CH*)
Mexipyrgus churinceanus	del. App. II	(CH*)
Mexipyrgus escobedae	del. App. II	(CH*)
Mexipyrgus lugoi	del. App. II	(CH*)
Mexipyrgus mojarralis	del. App. II	(CH*)
Mexipyrgus multilineatus	del. App. II	(CH*)
Mexithauma quadripaludium	del. App. II	(CH*)
Nymphophilus minckleyi	del. App. II	(CH*)
Paludiscala caramba	del. App. II	(CH*)
Achatinella spp.	incl. App. I	(NL)
ANTHOZOA		
Corallium rubrum		
Mediterranean Coral	incl. App. II	(ES)
FLORA		
Astrophytum asterias		
Star Cactus	tr.App. II-I	(GB)
Saussurea lappa		
Kuth	tr.App. I-II	(PK)
Fitz-Roya cupressoides		
Alerce-CL coastal pop.	tr.App. II-I	(AR)
Cycas beddomei		
Beddome's Cycad	tr.App. II-I	(IN)
Iphigenia stellata		
Starry Iphigenia	incl. App. II	(IN)
Nepenthes spp.		
Pitcher-plants	incl. App.II	(MY)
Nepenthes khasiana		
Indian Pitcher-plant	incl. App. I	(IN)
Paphiopedilum druryi		
Drury's Slipper Orchid	tr.App. II-I	(IN)
Dendrobium pauciflorum	tr.App. II-I	(IN)
Chrysalidocarpus lutescens		
Areca Palm	del. App. II	(NL)
Sarracenia spp.		
Pitcher-plants	incl. App. II	(US)

COUNTRY CODES (see also page 58)

Congo	CG	Pakistan	PK
France	FR	Spain	ES
India	IN	Switzerland	CH
Italy	IT	United Kingdom	GB
Malaysia	MY	United States	US
Netherlands	NL		

* proposals submitted in the context of ten-year review of the Appendices.
1 certain populations - to commercialize wool sheared from live animals.
2 portion of population of Paranicota - idem.
3 ranching.

incl.= include in; del.= delete from; tr.= transfer

The Status of and Trade in the Medicinal Leech

by Sue Wells and Wendy Coombes

INTRODUCTION

The Medicinal Leech Hirudo medicinalis has been used for blood-letting (phlebotomy) since several centuries BC and there are records from ancient Rome, Greece, India and China. The practice reached a peak in the mid-19th century, when the Leech was commonly used to treat, amongst other things, mental illnesses, headaches, gout, whooping cough and obesity. This intensive exploitation led to a significant reduction in its range and abundance throughout much of Europe. It is currently threatened by habitat loss, changing agricultural practices and renewed collecting pressure. The Leech is included in the IUCN Invertebrate Red Data Book under the category "Indeterminate" (i.e. known to be Endangered, Vulnerable or Rare but with insufficient data to say which category is appropriate). It is being proposed by the UK for listing in Appendix II of CITES and is being considered as a candidate for listing in Appendix III of the Bern Convention (Collins and Wells, in press).

Habitat and Ecology

The Medicinal Leech is typically found under stones in freshwater ponds, streams and marshes on both agricultural land and in forest and other natural habitats. It is more tolerant of oxygen-deficient water than other species and is often found in stagnant water. The young feed on frogs and tadpoles, while adults are external blood-sucking parasites on warm-blooded vertebrates, hence their association with areas where farm animals graze.

Distribution and Status

The Medicinal Leech was once abundant from western and southern Europe to the Ural Mountains and in countries bordering the eastern Mediterranean. It is known to have occurred in twenty-six countries, but no records have been obtained recently for Ireland, Portugal or European Turkey. It is now rare in the west of its range but possibly more abundant in the south-eastern Mediterranean part. It is considered extinct in one country (Ireland), threatened or apparently threatened in twelve (Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, Italy, Luxembourg, Poland, Romania, Spain), not threatened in three (Hungary, Norway, Sweden), and its status is unknown in ten (Elliott and Tullett, 1984; Wells et al., 1983; Wells et al., 1984). Elliott and Tullett (1984) reviewed recent records and these are summarized below, with additional more recent information on status.

Albania
Status unknown, but two recent records.

Austria
The best known population is in Lake Neusiedlersee and is vulnerable as the lake is undergoing considerable urbanisation. Cattle grazing has been stopped and there has been a decline in the frog population. There is also dumping of waste material. However, the Leech does not seem to be immediately endangered as the population appears to fluctuate from year to year (Burmeister in litt., 15.10.84; Kühnelt in litt., 17.12.82 and 30.9.86). It has also been recorded from Podersdorf, Ostufer (Burmeister in litt., 15.10.84).

Belgium
Recently found near Tournai (d'Huart in litt., 10.9.84) and Arlon (Maquet, 1985) having not been recorded since 1938. A possible third locality is being checked (Decraemer in litt., 5.8.86). It is considered to be rare and threatened (d'Huart in litt., 10.9.84).

Bulgaria
Formerly widespread, but declining and considered vulnerable. Some populations are still abundant (2 recent records) but are vulnerable to marsh drainage (Deltshev in litt., 5.11.82 and 4.8.86)

Czechoslovakia
Considered to be rare (4 recent records) or extinct in many parts of the country. Threatened by marsh drainage (Spitzer in litt., 11.10.82).

Denmark
Known from 31 localities on the mainland and observed at 11 of these between 1960 and 1986. Between 1960 and 1984, found at 20 of the 37 known localities on the island of Bornholm. Considered vulnerable except on Bornholm where it does not seem to be threatened (Baagøe and Jensen, 1985).

Finland
Many records up to 1900 for areas north to 63°N, but now only three from the south-west mainland coast and Åland island. This drastic decline is probably due to changes in farming methods; now considered indeterminate (Terhivuo in litt., 20.9.82).

France
Five recent records including the Camargue (Britton in litt., 22.3.82), Azay-le-Ferron (Indre) (Decraemer in litt., 5.8.86), and possibly the Marais de Carentain in Normandy (Debout and Provost, 1981), Uzés (southern France) (Burmeister in litt., 15.10.84) and around Bordeaux (Desbarax in litt., 30.6.81). Widespread drainage of marshes is a threat and the Camargue population may be declining through changes in salinity (Britton in litt., 22.3.82).

German Dem. Rep. and F.R. Germany
Considered almost extinct in both countries by 1922 (Arndt, 1940) but a few localities still persist (11 records in German Dem. Rep.; 10 in F.R. Germany). Thought to be decreasing in F.R. Germany (Nell in litt., 1981) but status unknown.

Greece
5 recent records. No information on status, but was protected in 1980, probably because it was considered threatened at that time.

Hungary
Common in all eutrophic waters of Hungary, such as those in the Kisbalatan, and numbers had increased between the 1930s and late 1960s (Keve, 1968). 17 recent records.

Ireland
Considered to be extinct, having not been found for at least 100 years (McCarthy, 1975). In the 18th century it was abundant in Blarney Lough, Lough Mask and several localities in County Dublin.

Italy
Records from many regions but only 10 are recent, suggesting that populations are declining (Minelli, 1979; Minelli in litt., 15.12.80; Oriano in litt., 4.11.86). Reported to be numerous in Sardinia (Burmeister in litt., 15.10.84).

Luxembourg

Found in small ponds and rivulets south of Luxembourg City (2 recent records); common in some areas but it is declining and is considered threatened (Hoffman, 1955 and 1960).

Netherlands

Rediscovered in 1946 after decades of absence (Dresscher and Higler, 1982). There are 15 recent records but its status is unknown.

Norway

Reported extinct in 1854 (Fermond, 1854), but found at 6 localities in the south since 1960 (Økland in litt., 5.10.82) and not considered threatened (Solem in litt., 10.9.86).

Poland

Originally scattered throughout the country excluding Upper Silesia and mountainous areas. Intensive collecting caused a temporary decline in populations in the central part of the country by the 19th century. In the Podlasie region, in the east, populations declined as a result of marsh drainage and collecting. May be found in ponds in towns, probably introduced after use for blood-letting therapy (Jażdżewska, 1983). 27 recent records.

Portugal

No scientific records, but may occur as Leeches are reportedly sent from Portugal to Canada (Davies in litt., 1986).

Romania

Still abundant in lakes, marshes and running waters of the plains, but is declining (10 recent records) and being replaced by Haemopsis sanguisuga (Băcesu in litt., 6.8.86).

Spain

8 recent records, including a large population in the Aiguamolls de l'Empordà National Park (Castello d'Empuries, Girona, north-west Spain) (Molinas in litt., 21.7.86) and one in Las Marismas in the Coto Doñana reserve (Mountfort, 1958). Molinas (in litt., 21.7.86) considers it to be rare but not endangered, and Alvarado (in litt., 15.9.86) believes it to be seriously threatened through pollution.

Sweden

Common in the 19th century but has declined since. There are a few known localities in the province of Scania and on the Baltic islands of Öland and Gotland, but these are not considered threatened (Arndt, 1940; Forselius, 1952). The introduction of free-ranging cattle may have benefited the species (Dahm in litt., 15.9.82).

Switzerland

4 records. No information on status.

Turkey

No scientific records but reported to be collected for commercial purposes (Nell in litt., 6.10.81; Fink, 1984).

UK

Once common, but rarer by 1816 and declared extinct in 1910. Subsequently rediscovered in isolated populations (19 records) scattered throughout the country, including Kent, New Forest, Lake District, Anglesey (this population may have been destroyed since the lake has been drained and refilled), Yorkshire, Islay, Argyll and Sutherland. 5 new localities have been found since 1982 and it may occur at other sites; the most recent record is Kenfig Pool, west of Port Talbot (Elliott and Tullett, 1982; Scofield, 1981).

USSR

33 recent records, mainly in southern USSR, Ukraine and Moldavia, the northern limit of its range running from just north of the Baltic provinces to Yaroslavl district, south of the Kama basin and Tyumen district, and to the Barabinsk lakes and Altai (Lukin, 1957). Considered to be rare (Sawyer, 1976) although in the 1950s its range was not thought to have been reduced by overcollecting (Lukin, 1957).

Yugoslavia

3 records. Known from Istrien (Rovinji) and Skutari-See (southern Yugoslavia (Burmeister in litt., 15.10.84). No information on status.

Leech Utilisation

Blood-letting therapy was the main use of the Leech in the 19th century, the focus for this practice being France. A government levy on imported Leeches, introduced in 1817, provides reliable documentation of numbers used in that country at that time. Between 1827 and 1843, 19-57 million were imported annually. One Paris hospital used 2 million in just seven years between 1830 and 1838, although 5000-60 000 a year was a more usual figure. It is estimated that in the 19th century, over 1000 million Leeches were imported into France alone (Sawyer, 1976 and 1981). Consumption may have been similar in other European countries but was unrecorded.

Blood-letting therapy is still carried out in some remote, rural parts of Europe, but there are now three main uses for the Medicinal Leech, which have led to increased exploitation of this species over the last few decades.

A. The pharmaceutical industry

Recently there has been a major revival in scientific and medical interest in the Medicinal Leech, as a result of several biologically active substances which have been isolated from the animals' salivary glands. The best known is hirudin, a substance, discovered by Haycraft in 1884, which prevents the coagulation of blood. It is already widely used commercially, many pharmaceutical companies supplying purified hirudin for use in medical preparations or as a research tool. It has been estimated that at least 12 000 kg of Medicinal Leeches are used for this purpose in Europe each year (Desbarax in litt., 30.6.81). A major pharmaceutical company in F.R. Germany, Plantorgan Werk KG, markets three products which contain hirudin: 'exhirud' for the treatment of thrombosis, thrombophlebitis, tendo-vaginitus, contusions, busitus and juvenile acne; 'Haemo-exhirud' for the treatment of haemorrhoids; and 'Dolo-exhirud' for the treatment of rheumatism. In 1984 sales of hirudin-based products in Germany rose by seventeen per cent (Perry in litt. to Wachtel, 5.11.84). The Belgian company Belgana produces 'Hiru-crème' which is similar to the German product 'exhirud' (d'Huart in litt., 10.9.84), Pentapharm Ltd in Switzerland makes a hirudin-based product (Dollinger in litt., 20.6.83) and hirudin-based products of unknown origin are on sale in Spain (Molinas in litt., 21.7.86).

More recently discovered substances, potentially as important, include:

1. Histamine: which increases the blood flow while the Leech feeds.
2. Hyaluronidase: which breaks down the hosts tissues to assist the spread of other compounds; Leech hyaluronidase is of interest because it works in a different way from the better known hyaluronidases from mammal testicular tissue and bacterial sources.
3. Bdellins and Eglins: which are the basis of the anti-inflammatory response following a Leech bite.
4. Anaesthetic: which has not been isolated or described but is known to exist as the Medicinal Leech bite is painless.

5. Plasminogen-activator: which prevents the coagulation of blood, as in other bloodsucking animals, and is the basis of other currently used anti-coagulants.
6. Destabilase: which is a very recently discovered fibrin-specific enzyme.

Extensive research is being carried out at present on these substances, and was reviewed at an international congress held in the UK in July 1986 on 'The Medical and Scientific Significance of the Leech' (Sawyer and Leake, 1986).

B. Plastic and micro-surgery

The Medicinal Leech was used earlier in the century in the treatment of haematomas and inflamed areas, and especially in the reduction of swellings close to the eye. Recently it has once again come to have an important application in hospitals in plastic surgery and micro-surgery involving the replacement of lost appendages, such as fingers and ears, and even a scalp. Through the action of substances such as the bdellins, eglins and other vasodilators, the swelling associated with such operations can be reduced (Cooper in litt., 8.10.84; Henderson et al., 1983; Sawyer and Leake, 1986).

C. The biological supply market

The Medicinal Leech is widely used for education and research in schools and universities. Its main zoological interest is the neuromuscular co-ordination of swimming and its neuropharmacology (Sawyer, 1976; Leake, 1983). Leech muscle may still be used occasionally, for example in Japan, in pharmacological laboratories for acetylcholine assay. US universities use about 2000 Leeches a year for neurophysiological research and total annual demand in US universities may be as high as 1.5 million (Goldsmith pers. comm., 1983).

Countries exporting live Leeches

No figures are available for the total number of Leeches involved in world trade, although Fink (1984) states that hundreds of thousands are harvested annually. Following the decline of western European populations, most specimens are now collected in Hungary and other eastern European countries. Collecting takes place mainly between March and September (Nell in litt., 6.10.81) or in the spring and autumn (Fink, 1984).

Hungary

Hungary has been the main source of Leeches in recent years. Large numbers were exported to F.R. Germany in the 1980s to the two major companies, E. Nell and Plantorgan Werk KG (see below) (Nell in litt., 1981; Fink, 1984); Austria, where dealers report imports from the Plattensee (Kühnelt in litt., 30.9.86); France (d'Huart in litt., 10.9.84); and Italy (Oriano in litt., 4.11.86). The exporting firm is Mavad. In 1982, they had 20 kg of Leeches in stock in June for export (Molnar in litt., 1982); it is not known if this is representative of their normal stocks. Since then, exports have declined to only 6 kg (Jan-Sept 1986), because the profit margin for collectors is too small and specimens are now only being supplied for local use (Molnar in litt., Sept. 1986).

France

Ricarimpex is the main supplier, both locally and overseas to countries including Canada, providing Leeches to universities, hospitals and the pharmaceutical industry (Desbarax in litt., 30.6.81). The UK imports live specimens from France (Lucas in litt., 20.5.82).

Italy

Oriano was exporting about 20 000 a year in the early 1980s (Oriano in litt., 10.10.81). Exports go to France, Switzerland, UK and USA, but some may include re-exports (or rather specimens collected) from Hungary (Oriano in litt., 4.11.86). Feliciano (in litt., 18.8.86) may once have exported Leeches but now only supplies them locally.

F.R. Germany

A major re-exporter, through the firm E. Nell (see below).

Greece

Although the Leech is protected, Greece is a major source for Plantorgan Werk KG, F.R. Germany (Fink, 1984).

Denmark

Leeches are reportedly occasionally exported to Norway (Solem in litt., 10.9.86), although they are also said to be imported for local use (see below).

Poland

The Medicinal Leech was once exported to Italy (Feliciano in litt., 18.8.86) and France (Jażdżewska, 1983) but it is not known if exports are continuing.

Portugal

No companies known, but Leeches are believed to be exported to Canada (Davies in litt., 1986).

Romania

Băcescu (in litt., 6.8.86) states that there is no trade in Leeches but Fink (1984) reports that they are collected for export to Plantorgan Werk KG in F.R. Germany.

Switzerland

The Italian dealer Feliciano (in litt., 18.8.86), used to import from Switzerland, but does so no longer.

Turkey

Collected in large numbers for centuries and a major source for F.R. Germany (Fink, 1984). One company is known to sell Leeches to hospitals in Europe (Nell in litt., 6.10.81).

UK

Exports captive-bred Leeches to a number of countries (see section on captive-breeding).

Yugoslavia

Reported to supply Leeches to F.R. Germany (Nell in litt., 6.10.81; Fink, 1984) and Italy (Oriano in litt., 10.10.81).

Countries importing live Leeches

Federal Republic of Germany

F.R. Germany is the main consumer of Medicinal Leeches. Plantorgan Werk KG, is the main consumer of Leeches in Germany and probably in Europe and imports from south-east Europe, mainly Balkan Greece, Turkey, Yugoslavia, Hungary and probably Romania (Fink, 1984). It produces three pharmaceutical products for the German market (see above). E. Nell is a dealer which has imported Leeches for many years from Hungary, Yugoslavia, Greece, and Turkey, and handles about 1 000 000 Leeches a year for companies involved in hirudin extraction, and an additional 200 000 for other uses in universities, hospitals and research institutes either in F.R. Germany (e.g. the Zoologischen Institut, which uses 600 Leeches a year) or abroad such as the USA (Nell in litt., 1981 and 4.11.81) and Switzerland (Dollinger in litt., 27.3.84). Other suppliers are Dr Theodor

Schuchardt & Co., who supplies hirudin, Carl Roth, and UEB Arzneimittelwerk Dresden. Spain imports Leeches from F.R. Germany for blood-letting (Molinas in litt., 21.7.86).

France
The firm Nicolas Ana imports Leeches from Hungary to produce hirudin extract (see below) (d'Huart in litt., 10.9.84). France also used to import from Poland (Jażdżewska, 1983) and may still import from Italy (Oriano in litt., 4.11.86).

Denmark
One company, Mecobenzon, imports about 100 live specimens a year (source not known), for sale to pharmacies, and to schools and universities for dissection (Baagøe in litt., 24.7.86).

Italy
Aversano Feliciano has supplied Leeches for many years to hospitals (about 200 Leeches a year) and pharmacies, and used to import from Switzerland and Poland; supplies now come only from southern Italy (Feliciano in litt., 18.8.86). Oriano imported Leeches from Yugoslavia in 1981, as well as collecting locally (Oriano in litt., 10.10.81); in 1986 imports apparently came from Hungary (Oriano in litt., 4.11.86).

Austria
Leeches are imported from Hungary (Kühnelt in litt., 30.9.86).

Belgium
Demand for live individuals is growing, particularly for use in microsurgery (d'Huart in litt., 10.9.84) but there is no information as to whether Leeches are currently imported.

Norway
Norsk Medisinaldepot occasionally imports Leeches from Denmark to produce extracts but hirudin is little used in medicine in Norway (Solem in litt., 10.9.86).

Spain
Leeches are not used regularly in hospitals, but are known, in one instance, to be imported from F.R. Germany for blood-letting (Molinas in litt., 21.7.86).

Switzerland
A Swiss University Institute was to import 400 Leeches in 1984 from E. Nell, F.R. Germany for research, 150 specimens having been imported by March (Dollinger in litt., 27.3.84). Imports may also come from Italy (Oriano in litt., 4.11.86).

UK
R. Brookes & Co. imported 5000 Leeches annually from France, Italy and eastern Europe to supply hospitals and research institutes for dissections and micro-surgery (Lucas in litt., 20.5.82). Several hospitals in the country were using Leeches in 1984 (Cooper in litt., 8.10.84). Imports may also come from Italy (Oriano in litt., 4.11.86). A number were imported in the early 1980s in order to set up a commercial leech farm (see section on captive-breeding).

USA
Large numbers are imported for university research and education (Goldsmith, pers. comm. 1983) from countries including F.R. Germany (Nell in litt., 1981 and 4.11.81) and Italy (Oriano in litt., 4.11.86).

Canada
Imported from Portugal for the Chinese market, and used in universities for research and education, some of the latter coming from France (Davies in litt., 1986; Desbarax in litt., 30.6.81).

Leech extract trade

A number of countries trade in Leech extract, mainly hirudin, for the production of medical preparations or for use in research.

Belgium
A single pharmaceutical company, Belgana, is involved in the Leech trade. It imports thirty litres of hirudin extract annually, produced by its mother company Nicolas Ana in France for the production of 'Hiru-crème' (d'Huart in litt., 10.9.84).

France
Between thirty and fifty litres of extract are exported annually from France to the Swiss firm Pentapharm (Dollinger in litt., 20.6.83). Also see above, under 'Belgium'.

F.R. Germany
Leech extract and products may be exported by some companies (see above).

Spain
Hirudin is available in chemist shops but is not of Spanish origin (Molinas in litt., 21.7.86).

Switzerland
Pentapharm Ltd, Basle, imports between thirty and fifty litres of extract from France each year for the production of a product containing hirudin (Dollinger in litt., 20.6.83).

Local Use

There is still some local use of Medicinal Leeches for medical purposes, either for blood-letting or for application to reduce swelling. Locally-caught Leeches are occasionally used in hospitals in Bulgaria (Deltshev in litt., 4.8.86) and Leeches are still collected in Poland for blood-letting (Jażdżewska, 1983). Mavad, the main Leech supplier in Hungary, now sells only to local hospitals and pharmaceutical companies (about 100-200 kg a year at US$55 per kg) (Molnar in litt., Sept. 1986). One of the main suppliers in France, Ricarimpex, collects Leeches locally and supplies them to French consumers as well as for export (Desbarax in litt., 30.6.81). In Italy, Aversano Feliciano supplies locally-collected Leeches, mainly from southern Italy, as well as imported ones, to hospitals (about 200 Leeches a year) and pharmacies (Feliciano in litt., 18.8.86). Grassi Oriano used to supply locally-collected Leeches for eye treatments (Oriano in litt., 10.8.81).

Prices and Values

Prices are stable but are reported by Fink (1984) to have been gradually increasing over the years. World sales of hirudin were £3.5 million or US$5.1 million MSP (Manufacturers' Selling Price) in the year to June 1984, of which almost £3.2 million (over ninety per cent) were in F.R. Germany. Over the same period, sales of the product Exhirud were £2 137 000, of Haemo-exhirud £683 000 and of Dolo-exhirud £356 000 (Perry in litt. to Wachtel, 5.11.84). In 1982, Mavad in Hungary were exporting Leeches at £28.50/kg (Molnar in litt., 1982), but local prices in 1986 were £40/kg. However, prices in Italy dropped from L1500-L5000 (US$1-$4) each in 1981 (Feliciano in litt., 7.10.81; Oriano in litt., 10.10.81) to L1000-L2500 (US$0.75-$2) in 1986 (Oriano in litt., 4.11.86; Feliciano in litt., 18.8.86). In 1981, imported Leeches into F.R. Germany were approximately 120DM (US$65) per 100 (Nell in litt., 6.10.81). Biological specimens for US universities cost US$5-$10 each (Goldsmith pers. comm., 1983).

Threats

By the beginning of the 19th century, local sources of Leeches had become depleted in western Europe. Wallachia, Bohemia, Spain, Portugal and Italy had all stopped exporting by the middle of the century and dealers started importing, primarily from the marshes of Hungary and the Balkan countries. There has been no significant recovery of the western populations and, with the renewed use of the species in large numbers by the pharmaceutical industry, the Leech may now be threatened in those areas where up to now it has been abundant.

Recently there have been several reports suggesting that Leeches are increasingly difficult to obtain (Niekisch in litt., 19.10.84), for example in Italy (Feliciano in litt., 18.8.86) and France (Desbarax in litt., 30.6.81). The Leech is attracted to man in water which makes it extremely easy to collect, as whole populations can be taken at once. Each purification of hirudin requires thousands of Leech heads; 1 kg of Leeches is required to obtain just 10 mg of eglin.

Furthermore, habitat alteration through changing farming methods and drainage of agricultural land is considered a major threat to remaining populations of the Medicinal Leech. Closer control of horses and cattle, and the habit of watering them at troughs, rather than at natural ponds, has decreased host availability and opportunities for expansion of its range (Desbarax in litt., 30.6.81; Fink, 1984; Mann, 1955; Wells et al., 1983).

National Conservation

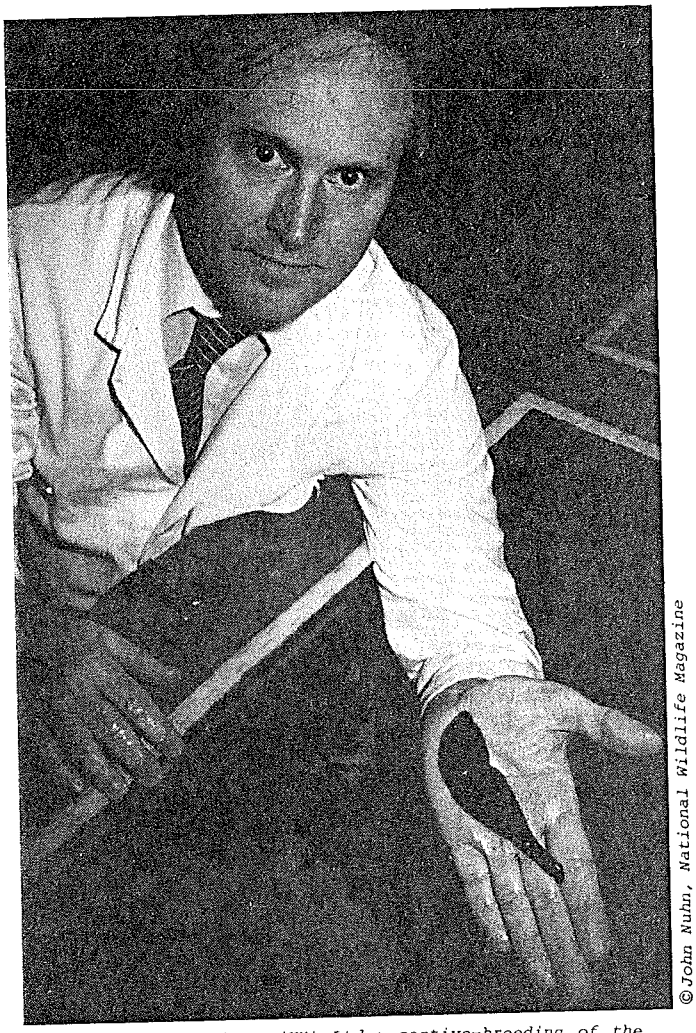
Following the decline of the Leech in the 19th century, strict government action was taken in many countries to regulate the trade. Hannover forbade export in 1823. In 1827 the Austrian Government gave two Viennese dealers a five-year lease for exclusive rights to use special reservoirs made specifically for Leeches. Sardinia banned export of Leeches for two years in 1828. In 1848 Russia imposed a tariff of 4-5 roubles per 1000 Leeches and the months May to July were closed for collecting. Hungary also introduced occasional embargoes (Sawyer, 1976).

The Medicinal Leech is currently protected under threatened species legislation in Greece, F.R. Germany and Luxembourg and is listed in the Finnish Red Data Book.

No protected areas have been set aside specifically for the conservation of the Medicinal Leech, but in several countries it is found within parks or reserves. For example, in Spain it is found in the Aiguamolls de l'Empordà National Park (Castello d'Empuries, Girona) (Molinas in litt., 21.7.86) and in Las Marismas in the Coto Donaña reserve (Mountfort, 1958). In the UK one locality, Kenfig Pool in Wales, is within a nature reserve.

Captive Breeding

Following the decline of the Medicinal Leech, breeding and pond-rearing programmes were started in the USA and Europe in an attempt to meet demand (Sawyer, 1976). For example, in the 18th and 19th centuries, populations in Sweden were boosted by importing Leeches to rear in ponds, although this was reportedly unsuccessful (Dahm in litt., 27.8.86 and 15.9.82), and Leeches were bred in 'leechantries', pharmacies and private houses in the 19th century in Poland (Jażdżewska, 1983). Pond culture was attempted in Finland in the 18th and 19th centuries but also with little success. More recently, research into Leech breeding was carried out in the USSR (Zapkuvene, 1972) and Plantorgan Werk KG has funded captive-breeding research since 1973 and shown that laboratory breeding is feasible (Fink, 1984). Mavad in Hungary plans to start a major Leech rearing project in a couple of years (Molnar in litt., 1986) and Ricarimpex in France has rearing ponds (Desbarax in litt., 30.6.81).



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Dr R. Sawyer, Biopharm (UK) Ltd.; captive-breeding of the Medicinal Leech will take pressure off wild populations.

In November 1984, the first commercial Leech farm, Biopharm (UK) Ltd, was set up in Swansea, UK with the aim of providing captive-bred Medicinal Leeches on a commercial basis. The farm has a standing crop of about 10 000 specimens and hopes eventually to meet world demand. The initial breeding stock for the farm came from E. Nell (F.R. Germany), Mavad (Hungary) and Ricarimpex (France). Over 10 000 Leeches have been bred and exported and there is a stock of some 30 000 specimens, including species other than H. medicinalis. Three-quarters of the Leeches produced go abroad, half to the USA. Consumers include university research scientists, plastic surgeons and medical research units; the level of use in hospitals is steadily increasing and the single largest customer of the farm is the British National Health Service. Live specimens and freeze-dried salivary glands, mainly used for research on salivary secretions, and biochemical extracts are supplied, the former making up the bulk of the trade (Sawyer in litt., 23.5.86; Sawyer and Leake, 1986).

Conclusions and Recommendations

The Medicinal Leech must be considered to be under threat in at least several parts of its range, largely from habitat destruction but also potentially from over-exploitation. It is possible that, through genetic engineering and other techniques, hirudin and some of the other important substances will be synthesised within the

next decade which would take the pressure off wild populations. Captive-breeding operations will also be of value but will probably only cater for teaching, research and direct medical application. However, the use of live Leeches in plastic surgery is increasing and can never be replaced by synthetic products. The major consumer, Plantorgan Werk KG in F.R. Germany, maintain that collecting is carried out with great care to avoid overexploitation, as collectors do not want to lose their source of income, and to provide an incentive to ensure the preservation of marshland in agricultural areas (Fink, 1984). Nevertheless, more widespread management of this important resource is required.

Listing on Appendix III of the Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats) would play a major role in protecting the Leech in those parts of western Europe where it is already rare and localized (Wells and Collins, in press). Countries with apparently healthy Leech populations must be encouraged to carry out surveys to determine whether current exploitation is detrimental. In particular, survey work is required in France and in many of the eastern European countries. Where there is a danger of overcollection, some form of regulation should be introduced, perhaps in the form of quotas, restricted collecting seasons, or rotation of collecting areas. The UK proposal (to be submitted at the next meeting of CITES Parties) that the species be placed in Appendix II of CITES will provide a valuable means of monitoring trade while permitting the continued development of captive-breeding research and development, as well as the rational use of wild populations.

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Australian Federal Prosecutions

Reptile Smugglers Gaoled

On 20 November 1986, at Adelaide, South Australia, two West German students from Frankfurt, Robert Seipp and Ralph Schroder, were convicted and sentenced to six months imprisonment for attempting to export 135 Australian reptiles through the post illegally. The total value of the reptiles, which included two CITES-listed species, Varanus gilleni and V. tristis, was estimated at over A$40 000 (US$26 000).

Postal staff in Stirling North, Port Augusta and Whyalla, South Australia, had become suspicious of the contents of several packages destined for F.R. Germany. The South Australian National Parks and Wildlife Service was alerted and, in a joint operation with the Australian Federal Police and the Australian Customs Service, located the two students who were later charged under the Wildlife Protection (Regulation of Exports & Imports) Act 1982. The following species were involved in the attempted smuggling:

Fat-tailed Gecko	Diplodactylus conspicillatus
Eastern Spiny-tailed Gecko	Diplodactylus intermedius
Beautiful Gecko	Diplodactylus pulcher
Narrow-toed Gecko	Diplodactylus stenodactylus
Spotted Dtella	Gehyra punctata
Tree Dtella	Gehyra variegata
Bynoe's Gecko	Heteronotia binoei
Knob-tailed Gecko	Nephrurus asper
Thick-tailed Gecko	Underwoodisaurus milii
Central Netted Dragon	Amphibolurus nuchalis
Bearded Dragon	Amphibolurus vitticeps
Earless Dragon	Tympanocryptis lineata
Pygmy Mulga Monitor	Varanus gilleni
Mournful Tree Monitor	Varanus tristis
Gidgee Skink	Egernia stokesii
Shingle-back Lizard	Trachydosaurus rugosus

Skin Smuggler Fined

Wilson Redondo of Western Australia was summarily convicted at Fremantle Court of Petty Sessions on 18 April 1986 for offences under the Wildlife Protection (Regulation of Exports & Imports) Act 1982. In July 1985, at Darwin, he had attempted to import illegally one skin of a Spotted Cuscus Phalanger maculatus and one skin of a Greater Bird of Paradise Paradisaea apoda from Papua New Guinea. Both species are listed in Appendix II to CITES. Redondo was fined A$600 (US$400) plus A$90.15 costs.

Parakeets Imported Illegally

On 27 January 1987, a West German citizen, Gunther Dittrich, was convicted and sentenced at Sydney District Court to 100 days imprisonment for attempting to import live birds contrary to Section 22(A) of the Wildlife Protection (Regulation of Exports & Imports) Act 1982. Dittrich had been apprehended by Customs officers at Sydney Airport on 12 December 1986 attempting to import illegally three Moustached Parakeets Psittacula alexandri which he had purchased in Thailand. The birds were destroyed by the quarantine service. Although a common avicultural species in some countries, the Moustached Parakeet is not commonly held in captivity in Australia and it is estimated that a breeding pair would fetch at least A$4000 (US$2600).

Source: TRAFFIC (Australia)

Australian State Prosecutions

Northern Territory

Bird Trappers Prosecuted

John McDonald Ellis and his son, Grahame, both of Ipswich, Queensland, were prosecuted at Katherine, Northern Territory, on 17 October 1986, for offences under the Territory Parks & Wildlife Conservation Act 1977-1984. The two men had been caught, by police, illegally trapping birds about 60 km from Katherine. Approximately forty birds, some dead, were found in their possession, including Crimson Finches Neochmia phaeton, Masked Finches Poephila personata and Double-barred Finches P. bichenovii. The men were fined A$3500 (US$2330) and their caravan, four-wheel drive vehicle and equipment were seized.

Another bird trapper was convicted at Katherine Magistrates Court on 5 December 1986. Hector Grenvold was charged under the Territory Parks & Wildlife Conservation Act with possession of forty Long-tailed Finches Poephila acuticauda and five Masked Finches P. personata. He was sentenced to twenty-eight days imprisonment and a fine of A$450 (US$300) or a further nine days on default of payment. All his trapping equipment was confiscated.

Queensland

Parrot Dealers Fined

Two Western Australians, Dean Martin and Robert Rabczynski, appeared in Goondiwindi Magistrates Court on 19 December 1986. They were charged, under the Queensland Fauna Conservation Act 1974-1985, with illegal possession, movement and importation (from New South Wales) of seven Black Cockatoos Calyptorhynchus funereus and two Major Mitchell's Cockatoos Cacatua leadbeateri. The men pleaded guilty to all charges and were convicted and fined A$2850 (US$1900) each.

At Beenleigh Magistrates Court on 16 January 1987, Kerry Hannifey of Loganlea, Queensland, was convicted for three breaches of the Queensland Fauna Conservation Act involving the taking, possession and movement of protected fauna, namely Rainbow Lorikeets Trichoglossus haematodus and Scaly-breasted Lorikeets T. chlorolepidotus. Hannifey was fined a total of A$1500 (US$1000) plus A$105.75 costs. He was also ordered to pay A$660 for the unlawful taking of twenty-two Rainbow Lorikeets and three Scaly-breasted Lorikeets. The action was taken by the Queensland Police Fauna Protection Squad. All the birds were seized and released into the wild.

On 9 February 1987, at Maroochydore Magistrates Court, Allan Brock of Mooloolaba, Queensland, was prosecuted for five breaches of the Queensland Fauna Conservation Act involving failure to maintain a register of records and submit monthly returns whilst being the holder of a fauna dealer's licence and dealing in fauna, including the sale of one Mallee Ringneck Parrot Barnardius barnardi, whilst not being the holder of a fauna dealer's licence. Brock, who pleaded guilty to all charges, was convicted and fined a total of A$3580 (US$2390) including costs and was ordered to pay A$90 for the unauthorised sale of the parrot. The action was taken by the Queensland Police Fauna Protection Squad.

Source: TRAFFIC (Australia)

Finch-trapping in W. Australia to Cease?

On 28 August 1986, the Western Australian Minister for Conservation and Land Management, Mr Barry Hodge, announced that he proposed to stop the commercial trapping of finches in the Kimberleys. The Minister stated, "In previous years tens of thousands of the birds were trapped, during open seasons, for sale on the domestic market throughout Australia." He said that, after approaches from Kimberley-based members of State Parliament, he had reluctantly approved a finch-trapping season from 1 September-15 November 1986 but, for the first time, a quota (23 000 birds) was to be imposed on the number of birds permitted to be caught.

Western Australia (WA) is the only state in Australia which allows the commercial trapping of finches for the avicultural trade and there has been concern voiced in other states and territories that the finch-trapping season in WA is creating law enforcement difficulties by providing a means of laundering illegally trapped birds. For some time, the seven licensed trappers in WA have been aware of the possible phasing-out of finch trapping and this was reflected in the substantially increased number of birds trapped in 1985 - 33 791 compared with approximately 23 000 in recent years (S. Shea, Department of Conservation and Land Management in litt. to Minister for Conservation and Land Management, 19.8.86). The WA Department of Conservation and Land Management statistics show that a total of 265 960[1] finches have been trapped in the Kimberleys from 1974 to 1985 comprising:

75 135	Long-tailed Finches	Poephila acuticauda
51 015	Star Finches	Neochmia ruficauda
30 669	Masked Finches	Poephila personata
25 164	Chestnut-breasted Mannikins	Lonchura castaneothorax
24 561	Double-barred Finches	Poephila bichenovii
23 071	Pictorella Mannikins	Lonchura pectoralis
22 328	Gouldian Finches	Erythrura gouldiae[2]
12 310	Crimson Finches	Neochmia phaeton
78	Painted Firetails	Emblema picta
129	Yellow-rumped Mannikins	Lonchura flaviprymna[3]
-	Zebra Finches	Poephila guttata[4]

A Wildlife Law Enforcement Seminar, hosted by the Australian National Parks & Wildlife Service in Canberra on 15-17 October 1986 and attended by Federal, State and Territory Enforcement Agencies, plus TRAFFIC (Australia), discussed the enforcement problems caused by the WA open season and supported the closure of commercial finch trapping in WA.

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[1]includes 1500 birds of unspecified species trapped in 1975.
[2]the Gouldian Finch was excluded from trapping in 1982 due to a general decline of the species throughout its range in Northern Australia.
[3]the Yellow-rumped Mannikin was excluded from trapping in 1976 when it was shown that the species was unable to withstand exploitation.
[4]the Zebra Finch had not been trapped commercially for over ten years when it was excluded from the list in 1981. The species is very widely bred in captivity.

Source: TRAFFIC (Australia)

One of the Ibiza Wall Lizards Podarcis pityusensis seized in the UK and returned to Ibiza.

Lizards Returned to Ibiza

The ninety survivors of a shipment of Ibiza Wall Lizards Podarcis pityusensis smuggled into the UK, were returned to their native Ibiza in the Balearic Islands, on 9 October 1986, following arrangements made by the Fauna and Flora Preservation Society.

A total of 500 Lizards, contained in one suitcase, were brought into the UK but seized by Customs at Stansted Airport. The animals were destined for pet shops in north-east London.

The Ibiza Wall Lizard is a species occurring only in the Balearics, and the shipment included specimens of different varieties, with particular patterns and colours found only in very restricted areas on certain rocky outcrops. A Spanish expert on Podarcis spp. will consider suitable areas for their release. The carriers, Iberian Airlines, agreed to return the Lizards free of charge.

Source: Herpetofauna News No. 6, November 1986

Seal Markets to be Developed

The Canadian Government is providing assistance to the sealing industry in Canada to develop new markets and products from older seals, following recommendations made by the Canadian Royal Commission.

A press release dated 17 December 1986 from the Canadian Fisheries and Oceans Department, concerning the Royal Commission report on seals and sealing, states that joint support is being provided by the Department of Indian Affairs and Northern Development and the Government of the N.W. Territories to Nunasi Corporation in 1986-87 to develop seal product markets. Consistent with the report's recommendations, the Government will not support a revival of the commercial hunting of Harp and Hooded Seal pups (Phoca groenlandica and Cystophora cristata), which ended three years ago as a result of an EEC import ban, which effectively dried up the market.

Source: International Fund for Animal Welfare

Publications Available

The Complete Cage and Aviary Bird Handbook
by David Alderton

160pp. 1986. Price: £12.95. Pelham Books.

Roughly half this book is devoted to sections relating to obtaining, housing, feeding and managing birds in captivity, and on breeding and common ailments. There seems to be a lot of useful advice in these sections although, apart from discussion of sexing-techniques and hand-rearing, much of the material seems to be a re-hash of the information contained in numerous other recent books bearing similar titles!

The other half of the book is devoted to information on "approximately 200 species of popular cage and aviary birds, covering a representative selection of the groups that are usually available". A series of excellent colour photographs illustrates 132 species and an indication of distribution is given for each one. Unfortunately, there is no mention of conservation or legislation in this section and the inclusion of several species endemic to Brazil will serve only to encourage the illegal trade from that country. The Seven-coloured Tanager Tangara fastuosa is a Red Data Book species that has suffered a severe decline in recent years, due largely to trapping for the bird trade. The Red Siskin Carduelis cucullatus (sic) is another rare species where, ideally, the reader should be warned to avoid the purchase of all except adequately documented captive-bred stock. Readers should also note that the Himalayan Goldfinch Carduelis carduelis caniceps is "subject to legal controls in Britain" despite the implication to the contrary.

Further confusion is provided by misidentification of a number of the species illustrated, a fault which is unfortunately common amongst bird-keepers and invokes the question as to the reliability of published information on behaviour and breeding of some species. The misidentified birds are listed below with their correct names which may help to avoid perpetuation of the errors:-

Name in caption	Correct name
Coccothraustes personatus	Coccothraustes migratorius
Euplectes orix orix	Euplectes (orix) franciscanus
Sporophila albogularis	Diuca diuca
Tangara guttata	Tangara punctata
Acridotheres cristatellus	Acridotheres fuscus
Lamprotornis chalybaeus	Lamprotornis corruscus
Cyanocorax affinis	Cyanocorax chrysops
Coturnix coturnix	Coturnix japonica

The distribution given is incorrect or misleading in a number of cases e.g. Erythrura prasina in Australia and Psittacula cyanocephala in South East Asia. Finally, there are many errors or inconsistencies in the scientific names leaving one with the feeling that it is essential for a book of this nature to be reviewed by an ornithologist prior to publication.

Tim Inskipp

World checklist of threatened mammals

125pp. 1987. Price: £6.50. No postage charge.

This publication was compiled by the IUCN Conservation Monitoring Centre for the Nature Conservancy Council, the UK CITES Scientific Authority, to assist in the implementation of CITES. It lists the scientific and common names of species and subspecies listed in the CITES Appendices and the IUCN Mammal Red Data Books and the geographical range, by countries, for each taxon. An extensive reference list is included.

Available from the Nature Conservancy Council, Northminster House, Peterborough PE1 1UA, UK.

Wildlife Utilisation Database

The Wildlife Trade Monitoring Unit has been contracted by the International Foundation for the Conservation of Game to determine the feasibility and desirability of establishing a computerised database on wildlife utilisation at the IUCN Conservation Monitoring Centre, in co-operation with the IUCN/SSC Ethnozoology Specialist Group.

There is an increasing tendency to use the potential utilitarian value of wildlife, both in direct products and in non-consumptive uses such as tourism, as an argument to justify its conservation. However, very few quantitative data are available to support these arguments, and those that have been produced are often scattered in obscure publications or unpublished reports. The consequences of this are that wildlife values may be underestimated or unrealised, research is duplicated and wildlife managers do not benefit from the experience (successes and failures) in other countries.

The current project is the first stage in overcoming these problems by determining what data are held on wildlife utilisation in existing major data centres; determining what data on wildlife utilisation are required by the conservation, development and governmental communities; and assessing methods by which such data and other similar data can be collected, stored and disseminated. Preliminary investigations suggest that the most useful initial step would be to draw up an annotated bibliography or abstracting service to disseminate existing data and to identify future research needs.

A cross-section of users and potential users of wildlife utilisation data will be contacted, to seek their views on the need for a centralised database, the type of information they require, and the form in which it is needed, their uses of the data, and the overall demand for such data. Any readers who have ideas on this subject are urged to contact Richard Luxmoore or Steven Broad at WTMU, who are responsible for the feasibility study.

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It is hoped that an index for Vols. I-VII will be published later in the year.

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