

# THE CAPTURE OF WILD BLACK RHINOCEROS USING FENTANYL AND AZAPERONE

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**ABSTRACT.** — A technique for the capture of 43 wild black rhinoceros using a combination of Fentanyl and Azaperone is described. One animal died and three others were not captured after being hit by darts. The rhinoceros, following immobilization were restrained in lateral recumbency on sledges and moved to holding corrals. Based on the results obtained three different drug mixtures can be recommended: for adult black rhinoceros, 60 mg of Fentanyl and 200 mg of Azaperone, for large sub-adults, 45 mg of Fentanyl and 150 mg of Azaperone and for calves, 30 mg of Fentanyl and 100 mg of Azaperone.

## INTRODUCTION

Since the introduction of neuroleptanalgesics into the field of animal immobilization there are several reports in the literature of their application in the capture of black rhinoceros (*Diceros bicornis* Linn.) (King and Carter 1965, Condy 1966, Jones 1966, King 1969, Hitchins, Keep and Rochat 1972, Harthoorn 1973, Hofmeyr, Ebedes, Fryer and de Bruine 1975).

Fentanyl (fentanyl citrate, Janssen Pharmaceutica, Beerse, Belgium), in combination with a variety of tranquilizers has been successfully used on the white rhinoceros (*Ceratotherium simum* Burchell) (Keep 1969, Haigh 1975). However, it has been reportedly tried only once in black rhinoceros and that attempt was unsuccessful apparently due to underdosage (Denney 1969). It has been used successfully in one unpublished instance (Luke *pers. comm.*). Azaperone (Azaperone, Janssen Pharmaceutica, Beerse, Belgium) has been used, in conjunction with Etorphine (Etorphine hydrochloride, Reckitt & Sons Ltd., Hull, England) on a number of black rhinoceros (Denney 1969, Hitchins *et al.* 1972, Hofmeyr *et al.* 1975).

## MATERIALS AND METHODS

Forty-three rhinoceros were captured, over a four-year period during both rainy and dry seasons, near Nanyuki, Isiolo or Maralal in Northern Kenya for the purpose of either translocation or commercial use by zoological collectors.

Fentanyl was used at solution strengths of 30 mg/ml and 10 mg/ml. Azaperone was used at solution strengths of 100 mg/ml and 300 mg/ml. Nalorphine hydrobromide (Lethidrone, Burroughs Wellcome & Co., London, England) at solution strengths of 25 mg/ml was used as the narcotic antagonist. Two types of dart projector were used, together with 1, 2 and 3 ml syringes activated by means of detonators (Cap-Chur extra long range projector, Palmer Chemical and Equipment Co., Georgia, U.S.A. and Dist-inject model 60 rifle, Peter Ott & Co., Basel, Switzerland). The barbed needles were of 5 or 3 mm outside diameter stainless steel, with partially blocked tips and laterally drilled holes. They were 9 cm in length for adult rhinoceros and 7 cm long for immatures.

Darting was carried out either from a Bell helicopter (38 animals) or a heavy-duty land vehicle (5 animals). Immobilized rhinoceros were restrained and hobbled in lateral recumbency, and then rolled onto sledges to which they were lashed. These sledges were winched

onto trucks (Fig. 1) and taken from 3 to 25 km across country and on rough tracks to holding pens. During transport to the pens, blindfolds were applied to protect the eyes from dust and direct sunlight (Fig. 2).

To help combat dart-wound sepsis, shock, stress and the possible reactivation of latent babesia and trypanosoma infections (King 1969, Harthoorn 1973) a standard combination of drugs was administered:

- (a) Ampicillin (Penbritin, Beecham Ltd., Greenford, Middlesex, England) up to 20 ml (3 g) into the dart wound.

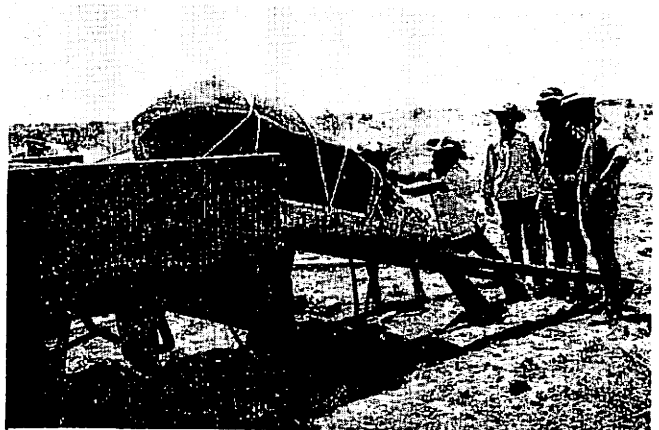


FIG. 1. Loading a rhinoceros lashed to a sledge by winching it up ramps onto a truck.



FIG. 2. Preparing to unload a rhinoceros laden sledge into a holding pen. The hobbling ropes, the blindfold and the tyres upon which the animals' head are resting can be seen.

- (b) A mixture of benzyl, procaine and benzathine penicillin (Diamine — The East Asiatic Co., Copenhagen, Denmark) at  $1/2$  million I.U. per 50 kg i.m.
- (c) Multivitamin injection (Parentovite — Beecham England) 10—40 ml i.m.
- (d) Diminazine aceturate (Berenil-Fabwerke Hoechst AG Frankfurt, Germany) 3,5 mg/kg i.m.

Wounds and abrasions were treated with topical zinc sulphate ointment.

Body measurements were made for the purpose of weight calculations (Freeman and King 1969).

The principal criteria used on each animal to assess its degree of neuroleptanalgesia were the rate and depth of respiration. Temperature and pulse rate were also recorded and palpebral reflexes were assessed.

Small booster doses of fentanyl were used when required to resedate animals in which the effects of the initial immobilizing dose had worn off. Small doses of nalorphine were also sometimes used to reverse apparent overdosage of analgesic.

### RESULTS

Following injection via the dart the sequence of events up to the animals' immobilization were slowing, circling, aimless crashing through obstacles, exaggerated hackney gait and either collapse into lateral recumbency or stopping against a bush, tree or bank, sometimes followed by a fall into sternal recumbency. Slowing was usually observed in 3 to 5 minutes and when ground crew were nearby, ataxic animals were lassooed before they became recumbent. This occurred on 14 occasions. Immobilization, in the 29 animals not caught with the lariat occurred in times of 2 to 18 minutes (mean time 7,6 minutes). The weights of rhinoceros captured in this series as estimated and calculated according to length of vertebral column and girth varied from 200 to 1700 kg. The mean effective doses were 50,5  $\mu\text{g}/\text{kg}$  of Fentanyl with 166  $\mu\text{g}/\text{kg}$  of Azaperone (Ranges 35—100  $\mu\text{g}/\text{kg}$  of Fentanyl and 35—500  $\mu\text{g}/\text{kg}$  of Azaperone). The doses used are illustrated in Figs. 3 and 4.

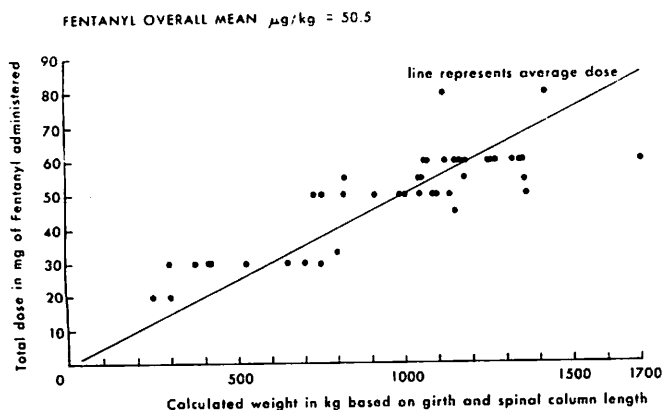


FIG 3. The relationship between dose in mg of Fentanyl and weight in kg of forty-three black rhinoceros captured using a Fentanyl/Azaperone mixture.

### Clinical signs

Respiratory character was the principal means used to assess the depth of narcosis. During studies to determine a normal resting respiratory rate, observations were made on captive rhinoceros. The rates varied from 12 to 26/min., the latter figure being recorded when the ambient temperature was in excess of 35°C. The highest respiratory rate observed was 66/min. in a small (150 kg) calf caught by roping without sedation. The respiratory rate of the captured rhinoceros varied on first inspection from 3 to 20/min. (mean 8/min.). Respiratory rates below 6/min. were considered to be potentially dangerous and a small intravenous dose of nalorphine was used on the 18 occasions that such respirations were observed, to partially revive the rhinoceros. The dose of nalorphine given varied from 25 to 50  $\mu\text{g}/\text{kg}$  (12,5 to 42,5 mg) according to the following factors:

- (1) respiratory rate
- (2) rate of change of respiratory rate
- (3) estimated tidal volume
- (4) regularity of respirations
- (5) mass of the rhinoceros and dose of fentanyl used in the immobilizing mixture.

The doses of fentanyl used *per se* on 19 occasions to facilitate unloading and maintain immobilization varied from 5 to 15  $\mu\text{g}/\text{kg}$  (5 to 15 mg) and given via the intramuscular route took effect in approximately five minutes.

Rectal temperatures were recorded in two healthy calves which had become tame, some weeks after capture. These ranged from 37,2°C in the morning to 39,1°C in the afternoon. The range of rectal temperatures recorded as soon as possible after capture by immobilization was from 36,8°C to 40,1°C. The records were made in 29 animals (mean 38,2°C). Temperatures above 39,2°C were recorded in seven animals after lengthy (above 22 minutes) chases, and in all cases reverted to below 39,2°C within 37 minutes of capture. The lowest temperature recorded in a rhinoceros was 35,5°C in a clinically hypoglycaemic 40

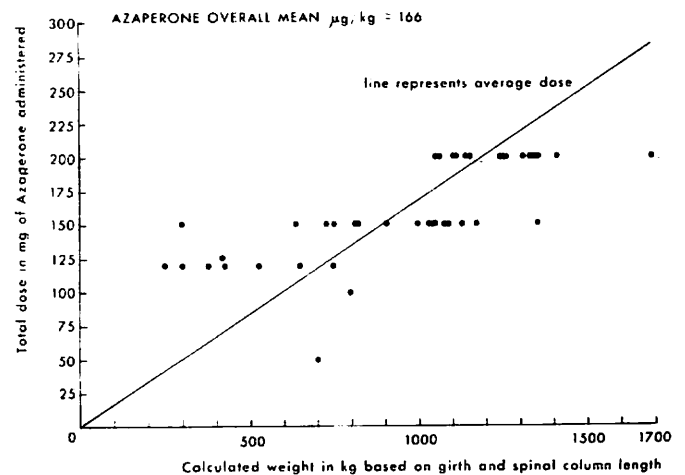


FIG 4. The relationship between dose in mg of Azaperone and weight in kg of forty-three black rhinoceros captured using a Fentanyl/Azaperone mixture.

kg calf 24 hours after capture by roping. The hypoglycaemia was treated with intra-peritoneal 5% dextrose solution and Parentrovite I.M. The calf eventually recovered and was sold a year later.

The range of pulse rates recorded in 32 captured animals was from 45/min. to 110/min. (mean 76/min.). The fastest pulse recorded in any rhinoceros was 120/min. in the roped calf mentioned above with a respiratory rate of 66/min.

Animals were restrained in lateral recumbency from 93 to 315 minutes. In only one instance, after the 315 minute restraint, was a transient (*circa* 10 minute) apparent radial paralysis observed.

#### *Analgesic reversal*

Nalorphine, the analgesic antagonist was used at the rate of 2.5 mg of nalorphine to 1.0 mg of fentanyl (Janssen 1969). In sixteen animals it was given intravenously (from 75 mg to 175 mg). These animals stood, without external stimulation, in a mean time of 51 seconds (range 35—120 sec.). The animal's first sign of recovery was usually an increase in both depth and rate of respiration. This was followed, about ten seconds before the animal started to struggle to rise, by twitching of the uppermost ear and a blink.

The mean time to standing from intramuscular injection of nalorphine (from 50 mg to 150 mg) in 22 animals was 248 seconds (range = 120—480 sec.). Most of these animals required stimulation either by prodding or having water poured over them before they stood up. Four animals, none of which had been given additional doses of fentanyl prior to unloading, did not receive nalorphine as they stood up while the hobbles were being removed. One animal died four minutes after falling into lateral recumbency despite intravenous treatment with 175 mg of nalorphine and doxapram hydrochloride (Dopram, A.H. Robins, Richmond, Virginia, U.S.A.) at 1 mg/kg.

#### *Losses*

One animal died at the time of capture. It had been driven, prior to darting, through wooded country for 18 minutes and had fallen into lateral recumbency 11 minutes after being injected. On examination 2 minutes later it had a respiratory rate of 2/minute, a temperature of 40.1°C and a pulse of 110/min. A post-mortem showed gross lesions which included widespread haemorrhages most conspicuous in the enlarged spleen, epicardium and scattered areas of the small intestine consistent with shock. The lungs had patches of emphysema, principally over the diaphragmatic lobes and there were areas of consolidation in all lobes. The bronchial lymph nodes were enlarged. Subsequent histopathology revealed a chronic, long-standing, muco-purulent bronchopneumonia. One other animal, the eighth to be captured died 12 days after capture. No post-mortem was carried out.

Three other animals into which darts were fired were not captured. In these, the darts were misplaced forward of the gluteal mass close to the lumbar vertebral spines in areas where drug absorption may have been delayed.

#### DISCUSSION

The results indicate that a combination of fentanyl and azaperone is a useful alternative to etorphine based mixtures in black rhinoceros.

The so-called 'pushing' phase of recovery as described by King (1969) and discussed by Hitchins *et al.* (1972) was never observed. As suggested by Hitchins *et al.* (1972) the azaperone tranquilization may be an important factor in preventing the exhaustion and death which may result from this problem.

Denney (1969) used 20 mg of Fentanyl and 300 mg of Azaperone, together with 10 mg of acetyl promazine (Boots Pure Drug. Co., Nottingham, England) on a rhinoceros which showed ataxia after seven minutes but was not captured. Luke (*pers. comm.*) did not record weight data on the successful capture of a single immature rhinoceros with 30 mg of Fentanyl and 150 mg of Azaperone. The animal in Denny's study was subsequently captured using etorphine and azaperone and accurately weighed. Its weight is recorded as 1085 kg. Based on the data presented here for 43 rhinoceros, a suitable dose for this animal might have been 50 mg of Fentanyl together with at least 150 mg of Azaperone.

In studies of mice (Gardocki and Yelnosky 1964) fentanyl was found to have a wide therapeutic index (775 as compared to 31 for morphine). This property, together with the possibility of ready reversal with narcotic antagonists allows large doses of the drug to be given in order to achieve rapid and effective immobilization.

Based upon the results it is suggested that three dose combinations could be used for wild black rhinoceros. These are:

60 mg Fentanyl and 200 mg Azaperone for adults  
45 mg Fentanyl and 150 mg Azaperone for large calves

30 mg Fentanyl and 100 mg Azaperone for calves from 250 kg to 650 kg.

In the light of good results with higher azaperone doses in other studies (Denney 1969, Hitchins *et al.* 1972, Hofmeyr *et al.* 1975) it might be possible to increase the azaperone dose by 50%, especially in view of the fact that in experimental animals it has a very wide margin of safety (Marsboom 1969).

Darting from a helicopter, as opposed to a land vehicle, proved much more efficient. It allowed access to areas which would have been impenetrable or certainly unsuitable for high speed ground chases, as well as much greater efficiency in searching for animals.

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*Received 3 August 1976*

*Revised 26 November 1976*

► Indeed, a permit for the export of five of the animals, to Poland, was issued last year. The shipment never took place and the permit is no longer valid.

The CITES Secretariat states that the Roys are not able to afford to keep the Gorillas much longer, that they cannot be released to the wild and that there are no facilities for keeping them captive in Cameroon. It is therefore suggested that the animals go to an institution (or institutions) "within the framework of a well managed captive breeding programme" or to a suitably equipped facility within the natural range of the species.

This latter suggestion is favoured by many conservationists who are concerned to prevent the entry into commerce of the seven animals, and to preclude the possible stimulation of illicit trade that might result. If the Gorillas cannot be returned to the wild, an African holding or breeding facility could serve a valuable educational function for the local people who might normally view the creatures as a source of food.

Concern over commercial Gorilla trade is increasing. Japan's annual report to CITES for 1982 records imports of two Gorillas from Cameroon for scientific purposes and two from Spain, allegedly captive-bred in Guinea. More recently Granby Zoo, Canada, imported a very young animal from Benjamin Onana, a dealer in Cameroon, in January 1984.

*CITES Secretariat  
International Primate Protection League  
(23.2/1.3.84).  
A.H. Harcourt (24.2.84)  
Miami Herald (21.1.84)  
Columbus Citizen Journal (15.2.84)  
Monitor (9.3.84)*

## Namibia Sells Ivory/Rhino Products

On 15 June 1983, the Department of Agriculture and Nature Conservation in South West Africa/Namibia, sold 99 kg of rhino horn by sealed tender. The rhino horn sold for R500 per kg in comparison to R376 per kilo fetched in 1982. Eight rhino feet sold for R8 each. A stock of 50 kg of rhino horn remains in the Department's possession.

In addition, about 1150 kg of ivory achieved an average of R56 per kilo - R10 more than the price obtained last year.

*Dept. of Agriculture and Nature Conservation  
SWA/Namibia*

*Natswa News, November 1983, No. 2*

## Cow Dung for Sale!

Fake rhino horns bearing a remarkable resemblance to the real thing are being produced in Southern Africa from resin, cow hair and cow dung. On at least two occasions in 1983, prospective rhino horn buyers in Zambia were offered fakes, totalling six. Reporting on this, the Save The Rhino Trust Newsletter (December 1983) remarks that the purchasers seized all the horn on both occasions and, in one case, the merchant! The prices asked were up to K150 (£64.00).

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## The Volume of the World's Trade in Rhino Horn

*by Esmond Bradley Martin and Jonathan Barzdo*

Since 1970 the world's population of rhinos has fallen by 70%, not only because of the increasing pressures of habitat disturbance but perhaps more particularly because of the pressures of trade.

From 1970 to 1979 the wholesale price of African rhino horn escalated from US\$30 to \$500 a kilo. In the same period the cost of Asian rhino horn soared from \$1 400 to \$8 000.

Asian rhino horn became so valuable because of its scarcity and an increased demand for it as a fever-reducing drug in South-East Asia which was experiencing an economic boom. However, the cost of African horn rocketed primarily because of a huge demand for it from a country which had hitherto consumed only small amounts.

An investigative study by Esmond Bradley Martin in 1978 showed that North Yemen had become the greatest consumer of rhino horn in the 1970s, importing approximately 40% of the world's total consumption, for the purpose of making dagger handles. In October 1983 he went to North Yemen again to up-date his study of the country's rhino horn demand. The information he gathered comes mainly from traders who deal in rhino horn.

Between 1973 and 1978 North Yemen imported an annual average of 3000 kilos of rhino horn, but that amount fell to a yearly average of about 1675 kilos from 1979 to 1982.

From 1972 to 1978 it appears that an average of approximately eight tonnes of rhino horn came onto the world market. For each of the years 1979 and 1980 however, the total was about four and a half tonnes.

In 1981 and 1982 this dropped to about two tonnes, and North Yemen's intake had increased to over 50% of what was available. Moreover, due to competition among buyers for the North Yemen sales, the wholesale price of African horn rose from \$500 in 1982 to \$700 in 1983. This 40% increase in just one year will put greater pressure on the estimated 13 000 Black Rhinos and 3100 White Rhinos remaining in Africa.

Below are the official import statistics for rhino horn into Japan, South Korea and Taiwan since 1979. A few comments on these are in order.

In August 1980 Japan ratified CITES and there have been no legal imports since then. The figures for South Korea are misleading because they represent only part of the picture. There were several hundred additional kilos coming into the country during each of the years shown, obtained by Korean smugglers who bought supplies from Hong Kong. Missing, of course, are official statistics from two major rhino horn consuming countries, North Yemen and mainland China; commercial imports there are now illegal. The world's total consumption of rhino horn can therefore only be estimated.

In the future it is extremely unlikely that eight tonnes of rhino horn will again reach the international market in any one year. There may not be enough rhinos left to supply such an amount. Indeed, unless the demands of rhino horn consumers are lowered and imports into North Yemen, China, South Korea, Taiwan and Singapore drastically cut, some populations of rhinos are likely to disappear altogether.

## European Hunting Examination ?

A meeting held in September 1983 by the Council of Europe has recommended that member States which do not already do so, incorporate in their legislation the requirements for a hunting examination. It was also proposed that a code of conduct for hunters be drawn up. A further meeting to decide on these recommendations is to be held in May.

*Council of Europe - Environment and Natural Resources Division*

## UK List of Vicuna Stocks

The following is a list of pre-Convention Vicuna cloth or wool products held by 29 stockists in the UK as recorded by the Department of the Environment. Each time a trader has applied to import or export a Vicuna-related product, DoE has requested his stock details. Occasionally updated information has been requested.

Also included in the list are amounts held by stockists not involved in import and export; however, the dealers are not obliged to provide information, therefore there may well be amounts held in the UK which are not recorded, and also stocks which may have passed on to other traders within the UK.

Each horizontal line below refers to the amounts held by a single dealer.

Vicuna UK Stock Levels  
January 1981 & June 1983

Stock (kg) Jan 1981	Stock Level June 1983 (kg)			
	Hair	Cloth	Yarn	Total
4.71	-	-	-	-
8.28	-	8.28	-	8.28
-	-	6.08	-	6.08
-	-	-	-	-
1.31	-	1.31	-	1.31
-	-	-	-	-
-	7.50	-	-	7.50
-	-	1.76	-	1.76
1432.00	1130.00	3.90	1.49	1135.39
-	-	0.20	-	0.20
-	-	0.25	-	0.25
0.70	-	-	-	-
-	-	-	-	-
11.93	7.00	-	8.90	15.90
-	-	-	-	-
0.75	-	0.06	-	0.06
-	-	9.99	-	9.99
1.83	-	-	-	-
10.50	-	7.11	-	7.11
0.10	-	0.55	-	0.55
-	-	-	0.24	0.24
3.08	-	-	-	-
1.12	-	0.65	-	0.65
9.00	-	-	8.86	8.86
1.33	-	31.59	-	31.59
-	-	-	3.20	3.20
42.12	-	35.49	-	35.49
5.00	-	-	5.00	5.00
109.32	-	0.42	-	0.42
1643.08	1144.50	107.64	27.69	1279.83

## UK Restricts Bird Imports

Following an outbreak of Newcastle disease in the UK, the importation of birds was prohibited and the granting of licences suspended on 6 February 1984. However, for some reason, the restrictions do not apply to family pets or to performing birds.

Ministers have since decided to permit a resumption of imports from those countries which have agreed to provide additional certification by an official veterinarian stating that the birds have been hatched and reared in their territory; appropriate quarantine premises of suitable standards must also be available. With effect from 22 March, imports of birds, subject to appropriate certification, will be allowed from the USA, Belgium and New Zealand and from 28 March, from Denmark, Norway, Switzerland and Finland.

As a result of the outbreak, thousands of birds in quarantine (mostly budgerigars, canaries and parrots) had to be destroyed.

*Ministry of Agriculture Fisheries and Food, UK*  
*Cage & Aviary Birds, 7.4.84*

## Gorilla Sale Opposed

A major dispute has been growing over the proposed export from Cameroon of seven young Gorillas (Gorilla gorilla, CITES Appendix I). The animals, all between four and seven years old, are in the possession of Mr and Mrs Robert Roy in Sangmelima, Cameroon, who are known to have been dealers in the past. Five other Gorillas held by the Roys were exported to France in 1980. They now plan to export the remaining seven to the USA through a company called Zoo Fauna of Miami, Florida, whose proprietor, Matthew Block appears to be the 'middleman' in this deal.

A number of conservation and welfare organisations have objected to the transaction, including World Wildlife Fund (US) and the International Primate Protection League (IPPL), and considerable press coverage has resulted in the USA.

In November 1983, during an official visit to the United Republic of Cameroon, Jaques Berney, Assistant Secretary General of the CITES Secretariat, together with officials of the CITES Management Authority for Cameroon, visited the premises of the Roys to inspect the Gorillas and discuss their fate. Therefore, as a result of the controversy, the Secretariat has issued a Position Statement. This makes clear that the Secretariat has not approved nor supported any commercial use of the seven Gorillas and has recommended that no import permit be issued if the transaction appears "to involve commercial advantages for any middleman".

The Roys do wish to recover the cost of having reared the Gorillas from a very young age (apparently they were orphaned by the killing of their mothers for meat). Memphis Zoological Gardens, North Carolina Zoological Park and Columbus Zoo have all applied for permits to import animals from the group, and several US newspapers report that zoos have made offers to Matthew Block in excess of US\$70 000 for each animal. Thus, a total of at least \$490 000 could be paid for the animals. This sum would do rather more than pay the Roys' costs.

However, the CITES Secretariat is satisfied that: the Roys are not animal traders now and have not been for several years; there is no evidence available to suggest that the Roys' activities have been illegal or contrary to CITES and the seven Gorillas were all legally acquired prior to the Convention entering into force in Cameroon (on 3 September 1981). On this basis, Cameroon's CITES Management Authority is reportedly prepared to issue an export permit for the animals. ▶

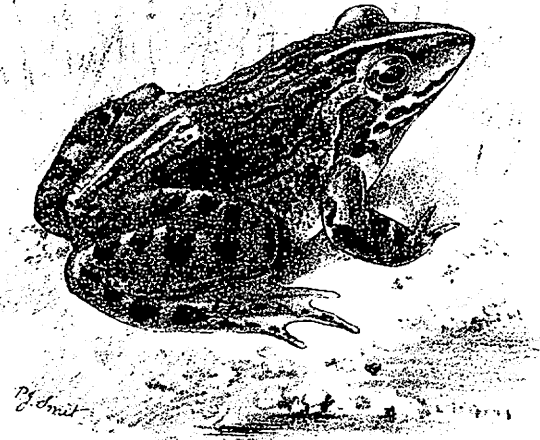
## Imports of Rhino Horn into Japan, South Korea and Taiwan from 1979 to 1983

<u>Importing Country</u>	<u>Year</u>	<u>Country of Consignment</u>	<u>Total Quantity in kilos</u>	<u>Total Value (US\$)</u>	<u>Average Price per kilo (US\$)</u>
JAPAN	1979	Kenya	234	66629	285
		S. Africa	68	29062	427
		Zambia	55	26153	476
		<u>total:</u>	<u>357</u>	<u>121844</u>	<u>341</u>
	1980	Kenya	7	4597	657
		S. Africa	587	223350	380
		China	106	37779	356
		Hong Kong	15	5673	378
		Zambia	48	20699	431
	<u>total:</u>	<u>763</u>	<u>292098</u>	<u>383</u>	
	1981	(nil)			
	1982	(nil)			
	1983*	(nil)			
	SOUTH KOREA	1979	Malaysia	30	10900
Indonesia			208	69331	333
Thailand			40	14229	356
Burma			20	11593	580
India			20	6775	339
<u>total:</u>		<u>318</u>	<u>112828</u>	<u>355</u>	
1980		Indonesia	93	41402	445
		Japan	89	14230	160
		Malaysia	21	7632	363
		Burma	10	4969	497
		Thailand	4	2585	646
<u>total:</u>		<u>217</u>	<u>70818</u>	<u>326</u>	
1981		Indonesia	127	68311	538
		China	10	4333	433
		Hong Kong	5	2563	513
<u>total:</u>	<u>142</u>	<u>75207</u>	<u>530</u>		
1982	Indonesia	200	102439	512	
	Kenya	35	15870	453	
	Japan	28	17498	625	
	<u>total:</u>	<u>263</u>	<u>135807</u>	<u>516</u>	
TAIWAN	1979	Hong Kong	170	28969	170
		S. Africa	11	4893	445
		Other countries	38	6339	167
		<u>total:</u>	<u>219</u>	<u>40201</u>	<u>184</u>
	1980	S. Africa	55	24284	442
		Singapore	2	2949	1475
	<u>total:</u>	<u>57</u>	<u>27233</u>	<u>478</u>	
	1981	S. Africa	47	22357	476
	1982	S. Africa	71	9675	136
		Indonesia	4	525	131
	<u>total:</u>	<u>75</u>	<u>10200</u>	<u>136</u>	
	1983**	S. Africa	117	76838	657

Sources: Japan Tariff Association, Japan Exports and Imports; Commodity by Country, Tokyo: various years. Republic of Korea, Statistical Yearbook of Foreign Trade, Office of Customs Administration, Seoul: various years. Chinese Maritime Customs, Statistical Series, No.1, The Trade of China (Taiwan District), compiled and published by the Statistical Department, Inspectorate General of Customs, Taipei: various years.

\* to November

\*\* Inspectorate General of Customs, In litt., 3.3.84.



Indian Bullfrog (*Rana tigrina*)

### Commercial Exploitation of the Indian Bullfrog in Bangladesh

The Indian Bullfrog *Rana tigrina* is widely distributed throughout the sub-continent of India and south-east Asia and occurs in all districts of Bangladesh, the greatest densities there occurring in the Districts of Mymensingh and Sylhet. Apart from consumption by indigenous and aboriginal people, all *R. tigrina* removed from the wild are destined for export.

A report by Professor Charles M. Fugler (1983), on the exploitation of this species, has recently been published and is the source of the following information.

The collecting of *R. tigrina* is an economically valuable activity and generates significant employment. At least one village in the District of Mymensingh depends on the capture and sale of this species and of various freshwater turtles for its livelihood. According to the report by Prof. Fugler, the foreign exchange earned by the export of frogs' legs from July 1975 - January 1976, was Taka 6 474 434 (approx. US\$359 000). For the years 1977-81 inclusive, a minimum of 9 744 559 pounds of processed frogs' legs were exported from Bangladesh at a value of US\$14 601 904 minimally (see table below). Processed hind-limbs are exported to Japan, US and many European countries.

Because of this commercial exploitation, wild populations of *R. tigrina* are becoming rapidly depleted, especially in Sylhet and Mymensingh Districts (which account for 80% of all *R. tigrina* taken within Bangladesh) and its present status is giving rise for concern. Apart from the harmful effects continued exploitation might have on its populations, there is a risk that uncontrolled harvesting of *R. tigrina* may have a disastrous effect on rice fields and wetlands, where this species protects valuable crops by devouring destructive insects.

A ban on collecting during the breeding season is enforced from 15 April-15 May; however this is easily and frequently contravened. Besides, field data suggest that the breeding season can extend beyond July. No other provisions exist for the control of this exploitation. Professor Fugler suggests various protective strategies that should be adopted: to ban the exploitation of wild stocks in the Districts of Mymensingh, Sylhet and Chittagong for a minimal period of two years and in alternate years thereafter in order to allow populations to recover; to divide the country into areas or zones where collecting would be permitted in alternate or every two years; or to ban all exploitation of the natural populations through two reproductive seasons, an approach similar to that already enforced in India.

Attempts at captive-breeding of *R. tigrina* are to be recommended but have so far proved unsuccessful.

Monthly Export from Bangladesh of Processed Frog Legs (in lbs) 1977-81  
(All annual totals except 1979 are minimum figures).

	1977	1978	1979	1980	1981
Jan	N/A	3080	776720	20120	40090
Feb	N/A	2000	45300	N/A	N/A
Mar	N/A	N/A	42800	N/A	37640
Apr	N/A	N/A	37920	N/A	N/A
May	56750	102280	4060	N/A	N/A
Jun	90320	N/A	12000	45210	N/A
Jul	98748	874382	341256	118754	378520
Aug	135784	127866	101400	179720	870590
Sep	N/A	759333	27160	342440	633015
Oct	274400	505552	103600	378390	474070
Nov	121240	N/A	181240	149500	95920
Dec	42440	234375	501990	253894	122690
Total Weight (lbs) Exported:	819,682	2,608,868	2,175,446	1,488,028	2,652,535
US\$ Value:	1,229,523	3,913,302	3,263,169	2,217,108	3,978,802

N/A: Not available.

Source: Fugler, Charles M. *The Status of Population of Rana tigrina Daudin in Bangladesh*, Bangladesh Fisheries Resources Survey System BGD/79/015, Fisheries Information Bulletin, 1(4):1-51, (June 1983), Dhaka, Bangladesh.





# WILDLIFE TRADE MONITORING UNIT

# Traffic Bulletin

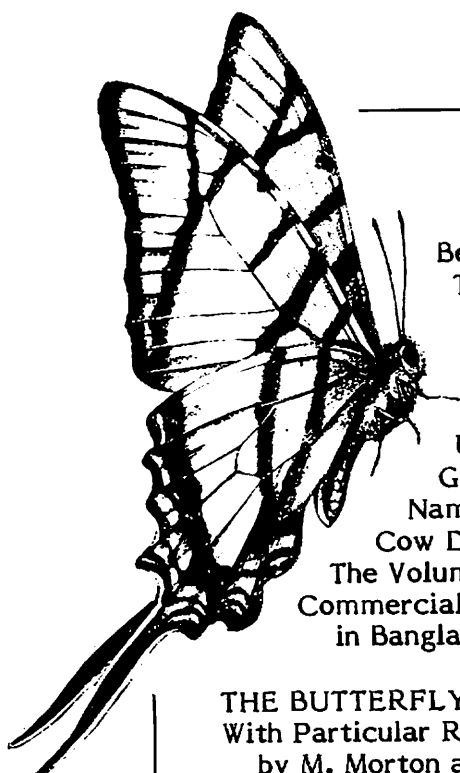
Publication of the **TRAFFIC Bulletin** is funded by  
**THE PEOPLE'S TRUST FOR ENDANGERED SPECIES**

ISSN 0144-0896

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Date of Publication: 11 April 1984

VOL. VI NO. 1

Publication of the Traffic Bulletin is funded by the People's Trust for Endangered Species, Hamble House, Meadow, Godalming, Surrey GU7 3JX, UK. Any opinions expressed in this Bulletin are those of the writers and do not necessarily reflect those of IUCN or any other organisation connected with WTMU. Information may be quoted freely, but an acknowledgement to WTMU/IUCN should be made where appropriate. The Editor would appreciate a copy of any reprinted material.

Published by the Wildlife Trade Monitoring Unit, IUCN Conservation Monitoring Centre, 219c Huntingdon Road, Cambridge, CB3 0DL, UK. Tel: Camb. 277427. Tlx: 817036. Compiled by Kim Lochen. Printed by Foister & Jagg Ltd., Abbey Walk, Cambridge.

## Benin Joins CITES

Benin has become the 86th member of CITES, acceding to the Convention on 28 February 1984; this will take effect from 28 May 1984.

## Threatened Tamarins in Japan

A total of 14 Golden Lion Tamarins (*Leontopithecus* spp., Appendix I) are known to have been imported into Japan from Guyana between August and November 1983. Three of them, identified as Golden-headed Lion Tamarins (*L. rosalia chrysomelas*) were re-exported to Hong Kong in September (see Traffic Bulletin V(5/6):51); two others have also been identified as being Golden-headed Lion Tamarins.

Eight specimens reported to be of *L. rosalia* were imported in August. In October the CITES Management Authority for Japan (MITI) received and approved an application to import a further ten animals. However the Customs statistics for November record the import of only six specimens and the Government has subsequently prohibited the importation of the remaining four. MITI has confirmed to Traffic (Japan) that both shipments came from Guyana and were imported on export documents allegedly issued by the Guyanese Ministry of Agriculture recording the animals as *L. rosalia* and 'captive-bred'. In March, however, the CITES Management Authority in Guyana officially confirmed to the CITES Secretariat that no export permits had been issued for *L. rosalia*. During the official visit to Japan, in April 1984, of the Secretary General of CITES, Eugene Lapointe, this matter was discussed with MITI and it is still under investigation.

The fate in Japan of five specimens has been verified: a pair of *L. r. chrysomelas* was sold to the Japan Monkey Center in November 1983 by Yoshikawa Shokai (also known to trade under the name of Isejima Zoo). The purchase was made because, according to a contact at the Center, it was felt that the individuals would die if left to the dealer. In December, two specimens, subspecies unknown, were received by Nihon Daira Zoo in Shizuoka from the same dealer, however one later died and a replacement was bought to make up a pair. Traffic (Japan) contacted Yoshikawa Shokai and was told that they had imported Lion Headed Tamarins "over the summer, in July or August", that it had taken over a year to secure them and that they had all been sold to zoos. The numbers involved were not revealed.

The whereabouts of the remaining six is not known.

Traffic (Japan)  
CITES Secretariat

## Traffic (Germany) Exhibition

An exhibition set up by Traffic (Germany) was opened at Frankfurt Airport on October 19, 1983 on the occasion of the 20th Anniversary of World Wildlife Fund (Germany) and the 10th Anniversary of CITES. The exhibition, which consists of 50 display-boards with a variety of confiscated CITES goods, has been funded by WWF (Germany), the Federal Ministry of Agriculture, the Bank of Commerce (Commerzbank AG), the German Fur Trade & Furriers Association and the Hessian Foundation for Nature Conservation. After two months at Frankfurt Airport, the exhibition was shown at the Alexander Koenig Museum of Natural History at Bonn until March; it is now on a tour of other West German cities.

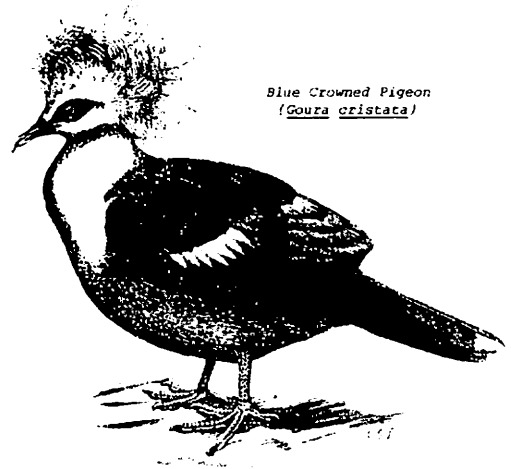
Traffic (Germany)

Traffic Bulletin, Vol. VI No. 1

## Bird Traders Fined

Further to our report in Traffic Bulletin V(3/4):49 concerning the seizures of 124 rare and endangered birds in Singapore, we can report that the trader responsible has been fined SG\$6550. The offender, who was caught in possession of 100 Palm Cockatoos (*Probosciger aterrimus*), 21 Moluccan Cockatoos (*Cacatua moluccensis*), two Brahminy Kites (*Haliastur indus*) and a Blue Crowned Pigeon (*Goura cristata*) (all CITES Appendix II species), faced four charges preferred against him under the Wild Animals & Birds Act. Each offence carries a maximum fine of SG\$1000. The birds were believed to be worth SG\$112 350.

The Palm and Moluccan Cockatoos are reported to have died, and it is believed that the Brahminy Kites and Blue Crowned Pigeon which had been sent to Jurong Bird Park, have also died.



Blue Crowned Pigeon  
(*Goura cristata*)

Five Indonesian barter traders have each been fined SG\$8500 for importing 34 Blue Crowned Pigeons into Singapore. Originally there had been 100 birds but only 34 were alive when the shipment was intercepted and these have been sent to Jurong Bird Park. The Blue Crowned Pigeon, which is endemic to Irian Jaya and nearby coastal islands, in New Guinea, is protected under Singapore's Wild Animals & Birds Act.

\* \* \* \* \*

In the United States, 104 Palm Cockatoos and 28 Eclectus Parrots (*Eclectus roratus*, Appendix II) originating in Indonesia and shipped via Singapore, have been confiscated (see Traffic Bulletin V(3/4):49). This confiscation has taken place under the US Lacey Act which prohibits the importation of wildlife illegally exported from another country. The importers, Anna Marie's Inc., a wholesale wildlife business in Fort Lauderdale, Florida, imported 100 of the Palm Cockatoos and the 28 Parrots at Miami on September 25, 1983 and had valued the birds at US\$700 000. The firm had previously imported the four other Cockatoos at Los Angeles. The US Fish and Wildlife Service, which claim this to be the largest importation of Palm Cockatoos ever known to have been made into the US, has taken possession of the birds and they are being cared for in zoos.

The Straits Times, 26.11/9.12.83  
Department of the Interior News Release 29.2.84