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A COMPUTERIZED RECORD SYSTEM FOR THE MANAGEMENT
OF WILD ANIMALS IN CAPTIVITY

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The International Species Inventory System or ISIS is a program of the American Association of Zoological Parks and Aquariums in collaboration with Federal agencies and private foundations to develop a census and vital statistics inventory system of animals held in captivity in zoos. It has become abundantly clear in recent years that our wildlife resources on this planet are diminishing too rapidly to avoid the loss of some species if we depend simply upon creation of parks or habitat management efforts. Therefore, it is essential that the resource offered by captive breeding efforts be explored and developed to its fullest capacity, providing the option of maintaining selected species in captivity when their loss in the wild appears inevitable. Also, the experience gained with captive populations can enhance the development of management procedures for wild populations in conservation or megazoo areas.

The American Association of Zoological Parks and Aquariums (AAZPA) at its annual meeting in the fall of 1973 adopted the recommendations of its Computer Data Committee that a national program for the collection and distribution of appropriate census and vital statistics data be developed and initiated. This action was supported by the American Association of Zoo Veterinarians (AAZV) at their meeting. Financial support for the initial phases of development of the project was provided by the two zoo organizations, the Office of Endangered Species, U.S.D.I., the Sams Foundation and the Frankel Foundation. The basic goals of the initial program were defined in terms of the questions: How many? Where? Age? Sex? Births? Deaths? Pedigree? and Who? (individual animal identification).

The basic components of the system developed include a numerically coded mammalian taxonomic directory listing all the species of mammals and for many orders the listing is carried to the level of subspecies. It also includes a numerically coded world geographic and institution directory with a listing of the world's zoos and museums as currently known to us. The geographic code is a nested hierarchical code by regions based on the Library of Congress map filing system. There is also an alternative allowing use of latitude and longitude coordinates. A data form has been designed which is suitable for use by the participating zoo as the core of its own record system. The first copy of the form is sent to us and the second on heavy paper may be filed in an ordinary filing cabinet. The fourth major component of the system is a set of detailed data management procedures.

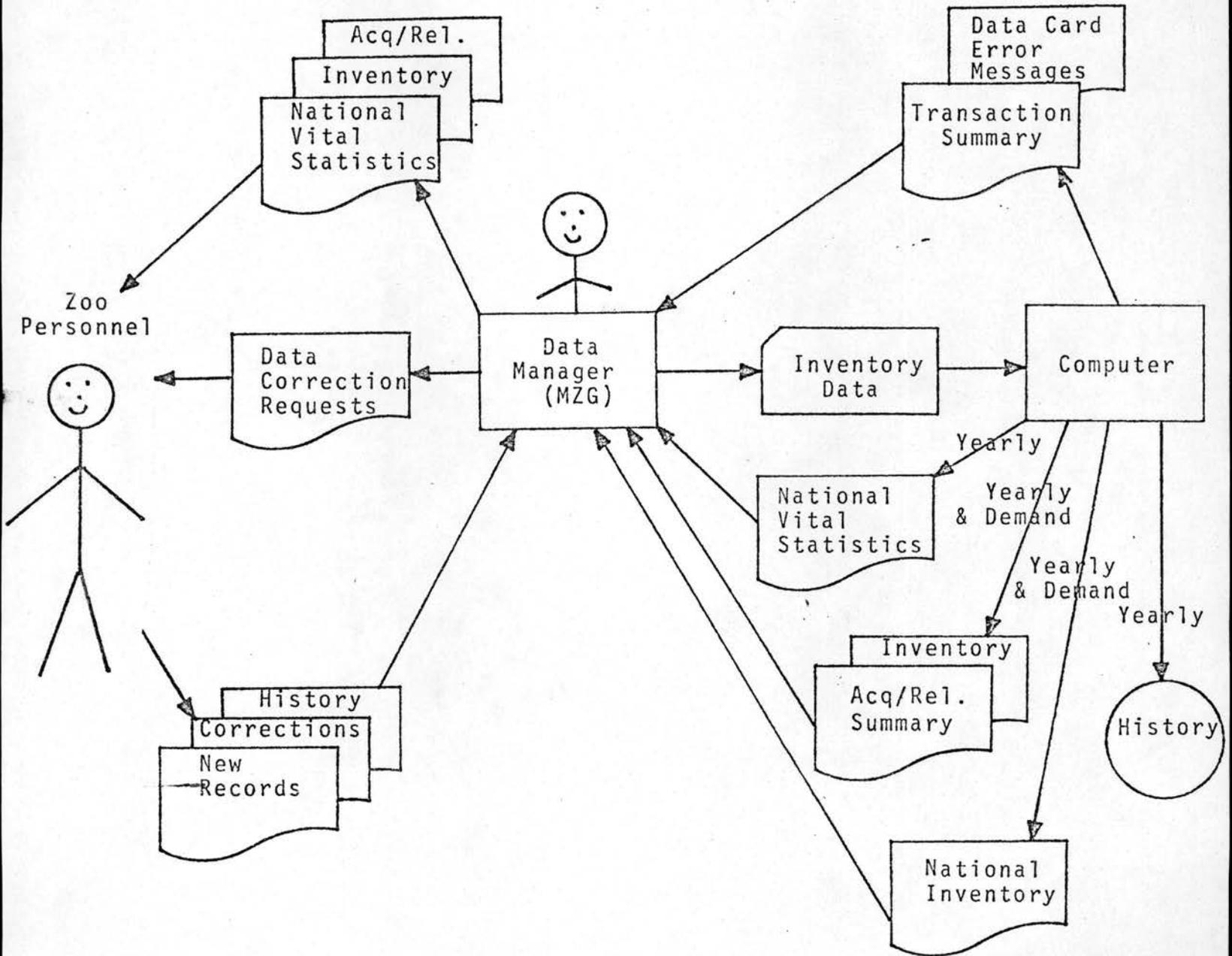
The flow of data between the participating zoo, the ISIS office, and the computer facility is summarized in Figure 1.

INSERT FIGURE 1

The data management process includes human review for errors and a computer error-edit program checking 65 different data relationships. The output of the system includes three major components. The first is the individual zoo inventory report which is completed on an annual basis and returned to the zoo for its own use. The second is the individual zoo acquisition/

FIGURE 1.

DATA FLOWCHART FOR ISIS SYSTEM



release report which is also completed on an annual basis and returned to the zoo. The third is a total species inventory report which summarizes all data by species. Copies of this report are sent to all participating institutions. This report allows extraction of data concerning distribution of breeding groups, young produced, deaths occurring, and the age distribution of the population. All reports can be produced on a quarterly basis. This system is functional for mammals. The birds are currently being added to the data base. During 1977 a taxonomic directory for reptiles and amphibians will be prepared to allow entry of these animals during the next year. We are also in the developmental process of a studbook and pedigree analysis subsystem, a physiological norms subsystem, and an autopsy subsystem. These subsystems will be linked to the basic census and vital statistics programs. The costs of developing and operating these systems have been borne by special project monies provided by Federal agencies, private agencies, zoo organizations and by a \$1.00 per year per mammal charge paid by the participating zoos. It is intended that the contribution by participating institutions be such as to provide the ongoing operating costs of the system so that it is a zoo-originated and sustained program.

We have recently completed and distributed the inventories for 1975. The inventories are reported on an anniversary date basis so that the data in the ISIS species inventory report represents the status of the zoos as of December 31, 1975. For this year there were 108 reporting zoos with a recorded 18,071 living mammals as of that date. During the year there were 2,805 births and 1,447 deaths recorded. This gives a birth to death ratio of 1.94 for all mammals. There were 792 autopsies recorded for an autopsy rate of 55%. We now estimate that there are about 30,000 mammals held in North American zoos. This number may be used to estimate approximate totals for each data set. The activity of the zoos with respect to animals entering and departing from the collections may be ascertained from the acquisition and release reports. The total acquisitions were 4,682 which included 2,805 births, 899 purchases, 189 trades (into the zoo), 520 donations (into the zoos), and 215 loans of animals into the zoos. The total releases were 3,282 which included 1,447 deaths, 995 sales to others, 267 trades, 284 donations, and 234 loans to others. These figures indicate a net gain in the zoos' population of 1,400 mammals which averages 13 animals per zoo.

One of the kinds of analysis of this data which can be made and which is of interest is of the composition of zoo collections. The distribution of specimens over the 19 mammalian orders is shown in Table I. Six orders of mammals account for 93.8% of all mammals held in zoos in this country and Canada. Three orders, the Primates, Carnivora, and Artiodactyla, account for 80% of all specimens, 85.5% of births, and 79.5% of deaths. Another six orders of mammals account for 5.6% of the specimens held. The remaining seven orders of mammals account for less than a half percent of the specimens held in captivity. To our knowledge, there are no Dermoptera held in this country. There are five manatees representing the Sirenia held by one Florida aquarium. Our estimates of the Cetacea are poor since few of the salt water aquariums are currently participating in this program.

TABLE I.

DISTRIBUTION OF MAMMALIAN SPECIMENS BY ORDER
FOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

MAMMALS-I 1975

<u>Order</u>	<u>Specimens</u>	<u>% of Mammals</u>	<u>Births</u>	<u>Deaths</u>
MARSUPIALIA	663	3.66	81	112
PRIMATES	4457	24.62	445	293
RODENTIA	1069	5.91	243	135
CARNIVORA	3814	21.07	411	294
PERISSODACTYLA	721	3.98	72	37
ARTIODACTYLA	<u>6253</u>	<u>34.55</u>	<u>1479</u>	<u>464</u>
Sums	16977	93.79	2731	1335

MAMMALS-II 1975

<u>Order</u>	<u>Specimens</u>	<u>% of Mammals</u>	<u>Births</u>	<u>Deaths</u>
INSECTIVORA	99	.55	13	28
CHIROPTERA	198	1.09	24	16
EDENTATA	236	1.30	7	20
PINNIPEDIA	236	1.30	9	28
PROBOSCIDEA	164	.91	2	3
HYRACOIDEA	<u>87</u>	<u>.48</u>	<u>18</u>	<u>15</u>
	1020	5.63	73	110

MAMMALS-III 1975

<u>Order</u>	<u>Specimens</u>	<u>% of Mammals</u>	<u>Births</u>	<u>Deaths</u>
MONOTREMATA	25	.14	0	1
DERMOPTERA	0	0	0	0
PHOLIDATA	3	.02	0	0
LAGOMORPHA	29	.16	0	0
CETACEA	6	.03	0	0
TUBULIDENTATA	11	.06	1	1
SIRENIA	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	74	.41	1	2

Another significant underestimate of captive-held animals is the elephants, as there is no data from circuses. Estimates of primates does not include any data from the regional primate centers. Overall, zoos contain representatives of approximately 850 species of the 3,968 species listed in the ISIS taxonomic directory.

A further analysis of the three orders accounting for most of the zoo-held animals is of interest. Primate families shown in Table II are broadly represented with the African monkeys accounting for approximately 40% of the total. The representation of the Carnivora, Table III, is significantly biased towards the cats with the Felidae accounting for 48% of the carnivores exhibited. This family contains a large number of species on the endangered list and considerable effort has gone into successful management of these species. This is reflected in the fact that sufficient success has been achieved with the Siberian tiger, Bengal tiger, jaguar, and Indian leopard to allow their consideration as captive, self-sustaining populations as defined by regulations pertaining to the Endangered Species Act of 1973 (See Table IV and V). The representation of the Artiodactyla (Table VI) is predominantly represented by the Bovidae (59%) and Cervidae (24%). Here again, management practices have been generally successful as indicated by the high birth rate. Many of these species clearly have the potential for establishment as captive, self-sustaining populations given appropriate genetic and demographic strategies in combination with the necessity for doing so.

The Bovidae may be further subdivided into five subfamilies, as shown in Table VII. Representation of these subfamilies is spread fairly evenly except for the duikers. The Antilopinae contain 13 genera and 32 species, but 93% of the exhibited animals are from five of the genera. (Table VIII) Seven of the eight genera in the Bovinae are represented including significant populations of several endangered species (gaur and wisent) (Table IX). The Caprinae contain 13 genera and 25 species but 94% are from four genera (Table X). Seven of the nine genera of Hippotraginae are represented, including significant populations of addax, wildebeest and oryx (Table XI). The Cephalophinae distribution is given in Table XII. We may examine further the genus *Oryx* which is represented by 259 specimens including 64 young produced in 1975. There were 13 deaths during 1975. This genus contains three species, one of which is represented by three subspecies. Since this 1975 census represents perhaps about 65% of the mammals held in this country it would appear that each of the forms of oryx may be held in sufficient numbers in this country to allow examination of their biological status as captive, self-sustaining populations both from the points of view of population genetics and population demography (Table XIII).

In June, 1976 ISIS data was analyzed with regard to the twenty-seven (27) new primates proposed for inclusion under the Department of the Interior's Endangered or Threatened Species List (Table XIV). We believe that the hard data from 108 institutions reflects about 70% of the total captive population of the species or subspecies referred to in Table XIV. In analysis, a factor of 1.5 was applied to create an estimated index for all zoos. For example, for

TABLE II.

DISTRIBUTION OF PRIMATE FAMILIES
FOR 108 INSTITUTIONS AS OF 31, DECEMBER 1975

<u>Family*</u>	<u>Specimens</u>	<u>% of Primates</u>	<u>Births</u>	<u>Deaths</u>
LEMURIDAE	563	12.63	74	11
LORISIDAE	268	6.01	28	33
CEBIDAE	848	19.03	61	82
CALLITHRICHIDAE	330	7.40	77	50
CERCOPITHECIDAE	1752	39.30	176	89
PONGIDAE	<u>681</u>	15.28	<u>29</u>	<u>27</u>
	4457		445	293

* The Indridae, Daubentoniidae, Tarsiidae and Hominidae have a total of 20 specimens listed in the inventory.

TABLE III.

DISTRIBUTION OF CARNIVORA FAMILIES
FOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

<u>Family</u>	<u>Specimens</u>	<u>% of Carnivora</u>	<u>Births</u>	<u>Deaths</u>
CANIDAE	533	13.97	71	41
URSIDAE	532	13.95	51	30
PROCYONIDAE	325	8.52	19	18
MUSTELIDAE	323	8.47	31	70
VIVERRIDAE	200	5.24	26	14
HYAENIDAE	61	1.60	3	2
FELIDAE	<u>1840</u>	48.24	<u>210</u>	<u>119</u>
	3814		411	294

TABLE IV.

POSSIBLE CAPTIVE SELF-SUSTAINING POPULATIONS
OF FIVE SPECIES LISTED ACCORDING TO 1974 ISIS INVENTORY

<u>Species</u>	<u>Names</u>	<u>Individuals</u>	<u>Sex Ratio</u>	<u>Institutions</u>	<u>Breeding</u>	<u>Births</u>	<u>Deaths</u>
<u>Panthera tigris</u>	Tiger	289	1/1.3	54	25	104	20
<u>Panthera pardus</u>	Leopard	217	1/1.1	52	18	54	21
<u>Panthera onca</u>	Jaguar	141	1/1.0	46	12	38	12
<u>Lemur catta</u>	Ringtailed lemur	146	1/1.1	9	2	24	0
<u>Lemur macaco</u>	Black lemur	169	1/1.4	26	10	24	2

TABLE V.

AGE STRUCTURE OF POSSIBLE CAPTIVE SELF-SUSTAINING POPULATIONS
OF FIVE SPECIES LISTED ACCORDING TO 1974 ISIS INVENTORY

<u>Age Class</u>	<u>Species</u>				
	<u>P. tigris</u>	<u>P. pardus</u>	<u>P. onca</u>	<u>L. catta</u>	<u>L. macaco</u>
< 1	103	52	31	24	21
2	36	13	18	13	11
3	16	13	9	18	17
4	17	16	12	15	18
5	16	20	13	16	19
5-10	54	70	33	55	29
10-15	28	19	17	18	21
15-20	14	8	5	3	1
> 20	5	6	3	2	9

TABLE VI.

DISTRIBUTION OF ARTIODACTYLA FAMILIES
FOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

<u>Family</u>	<u>Specimens</u>	<u>% of Artiodactyla</u>	<u>Births</u>	<u>Deaths</u>
SUIDAE	8	.13	3	0
TAYASSUIDAE	75	1.20	10	1
HIPPOPOTAMIDAE	138	2.21	16	4
CAMELIDAE	562	8.99	114	39
TRAGULIDAE	24	.38	0	1
CERVIDAE	1501	24.00	360	109
GIRAFFIDAE	186	2.97	15	8
ANTILOCAPRIDAE	49	.78	6	8
BOVIDAE	<u>3701</u>	59.19	<u>955</u>	<u>294</u>
	6253		1479	464

TABLE VII.

DISTRIBUTION OF THE BOVIDAE BY SUBFAMILY
FOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

<u>Subfamily</u>	<u>Individuals</u>	<u>% of</u>		
		<u>Bovidae</u>	<u>Births</u>	<u>Deaths</u>
Antilopinae (13 g, 32 sp)	634	17.0	159	46
Bovinae (8 g, 23 sp)	1025	27.5	202	71
Caprinae (13 g, 25 sp)	1113	29.8	366	96
Cephalophinae (2 g, 16 sp)	94	2.5	23	22
Hippotraginae (9 g, 22 sp)	864	23.2	205	59
Total	3730		955	294

TABLE VIII.

DISTRIBUTION OF ANTILOPINAE
FOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

<u>Genus</u>	<u>Common Name</u>	<u>Individuals</u>	<u>Births</u>	<u>Deaths</u>
Aepyceros	Impala	43	5	3
Ammodorcas	Dibatag	0	-	-
Antidorcas	Springbok	79	30	4
Antilope	Blackbuck	201	58	18
Dorcastragus	Beira antelope	0	-	-
Gazella (11 sp)	Gazelles	225	40	12
Litocranias	Gerenuk	0	-	-
Madoqua (5 sp)	Dik-Diks	18	7	8
Neotragus (3 sp)	Dwarf antelope	11	3	0
Oreotragus	Klipspringer	8	1	0
Ourebia	Oribi	8	1	0
Procapra (2 sp)	Mongolian gazelle	0	-	-
Raphicerus (3 sp)	Steenbok, Grysbok	41	14	1
	Total	634	159	46

TABLE IX.

DISTRIBUTION OF BOVINAEFOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

<u>Genus</u>	<u>Common Name</u>	<u>Individuals</u>	<u>Births</u>	<u>Deaths</u>
Bison (2 sp)	Bison, Wisent	244	37	15
Bos (5 sp)	Gaur, Yak	220	44	15
Boselaphus	Nilgai	84	14	8
Bubalus (4 sp)	Buffalo, Anoa	29	9	0
Syncerus	African buffalo	47	8	1
Taurotragus (2 sp)	Eland	115	29	8
Tetracerus	4-Horned Antelope	0	-	-
Tragelaphus (7 sp)	Bushbuck, Kudu, Sitatunga	286	61	24
	Total	1025	202	71

TABLE X.

DISTRIBUTION OF CAPRINAEFOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

<u>Genus</u>	<u>Common Name</u>	<u>Individuals</u>	<u>Births</u>	<u>Deaths</u>
Ammotragus	Aoudad	213	69	21
Budorcas	Takin	2	0	1
Capra (5 sp)	Markhor, Ibex	277	106	14
Capricornis (2 sp)	Serow	0	-	-
Hemitragus (3 sp)	Tahr	135	26	15
Nemorhaedus	Goral	2	0	0
Oreamnos	Mountain goat	14	2	1
Ovibos	Musk Ox	10	4	3
Ovis (6 sp)	Sheep	419	157	41
Pantholops	Tibetan antelope	0	-	-
Pseudois	Bharal	1	0	0
Rupricapra	Chamois	18	2	0
Saiga	Saiga antelope	2	0	0
	Total	1113	366	96

TABLE XI.

DISTRIBUTION OF HIPPOTRAGINAEFOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

<u>Genus</u>	<u>Common Name</u>	<u>Specimens</u>	<u>Births</u>	<u>Deaths</u>
Addax	Addax	121	34	7
Alcelaphus (2 sp)	Hartebeest	40	4	2
Connochaetes (2 sp)	Gnu, Wildebeest	154	31	16
Damaliscus (3 sp)	Blesbok, Topi	114	31	12
Hippotragus (2 sp)	Sable, Roan	82	19	7
Kobus (5 sp)	Waterbuck, Kob	94	22	2
Oryx (3 sp)	Oryx, Gemsbok	259	64	13
Pelea	Rhebok	0	-	-
Redunca (3 sp)	Reedbuck	0	-	-
	Total	864	205	59

TABLE XII.

DISTRIBUTION OF CEPHALOPHINAE
FOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

<u>Genus</u>	<u>Common Name</u>	<u>Individuals</u>	<u>Births</u>	<u>Deaths</u>
Cephalophus (15 sp)	Duikers	94	23	22
Sylvicapra	Common duiker	0	-	-
		—	—	—
	Total	94	23	22

TABLE XIII.

DISTRIBUTION OF THE GENUS ORYX
FOR 108 INSTITUTIONS AS OF 31 DECEMBER, 1975

<u>Species</u>	<u>Common Name</u>	<u>Individuals</u>	<u>Births</u>	<u>Deaths</u>
O. dammah	Scimitar-Horned	68	19	0
O. g. gazella	Gemsbok	60	20	9
O. g. beisa	Beisa	40	13	4
O. g. callotis	Fringe-eared	25	8	0
O. leucoryx	Arabian	66	4	0
		—	—	—
	Total	259	64	13

TABLE XIV.

ANALYSIS OF 27 PRIMATES PROPOSED FOR INCLUSION AS ENDANGERED OR THREATENED SPECIES

	No. of Insti- tutions	Est. No. of Insti- tutions	Total No. Ani- mals	Est. To- tal No. Animals	Births	Est. No. Births	Deaths	Est. No. Deaths	Less than 5 years Est.	Greater than 5 years Est.		
<u>ENDANGERED LIST</u>												
1. (<i>Saguinus oedipus</i> (cotton top marmoset) -----	23	34	80	120	21	32	10	15	52	78	28	42
(<i>Saguinus geoffroyi</i> -----	3	5	12	18	2	3	1	2	10	15	2	3
2. <i>Saguinus bicolor</i> (pied tamarin)-----	1	2	1	2	0		1	2	1	2		
3. <i>Lagothrix flavicauda</i> (yellow-tailed woolly monkey) -----	1	2	1	2								
4. (<i>Cercopithecus diana</i> (diana monkey) -----	25	38	82	123	8	12	3	5	33	50	49	74
(<i>C. roloway</i> -----	2	3	4	6	0		0		1	2	3	5
(<i>C. dryas</i> -----	0		0		0		0		0		0	
5. <i>Cercopithecus erythrotis</i> (red-eared nose-spotted monkey)-----	0											
6. <i>C. erythrogaster</i> (red-bellied monkey)-----	0											
7. (<i>C. L'hoesti</i> (L'hoest's monkey) -----	0											
(<i>C. preussi</i> -----	0											
8. (<i>Cercocebus torquatus</i> (white-collared mangabey) -----	12	18	41	62	6	9	5	8	16	24	25	38
(<i>C. atys</i> -----	3	5	6	9	0		0		0		6	9
(<i>C. lunatus</i> -----	3	5	7	10	1	2	0		3	5	4	6
9. <i>C. satanus</i> (black colobus) -----	0											
10. <i>Papio sphinx</i> (mandrill)-----	32	48	116	174	15	22	10	15	42	63	74	111
11. <i>Papio leucophaeus</i> (drill)-----	8	12	21	32	1	2	1	2	6	9	15	22
12. <i>Presbytis Francoisi</i> (Francois' leaf monkey)-----	0											
<u>THREATENED LIST</u>												
1. <i>Nycticebus pygmaeus</i> (lesser slow loris) -----	0											
2. <i>Tarsier syrichta</i> (Philippine tarsier) -----	1	2	2	3	0		0		0		2	3
3. <i>Saguinus leucopus</i> (Whitefooted tamarin)-----	3	5	7	10	0		1	2	6	9	1	2
4. <i>Alouatta pigra</i> (black howler monkey)-----	0											
5. <i>Saimiri sciureus</i> (squirrel monkey)-----	42	63	240	360	32	48	27	40	138	207	102	153
6. <i>Theropithecus gelada</i> (gelada baboon)-----	15	22	81	122	1	2	6	9	33	50	46	72
7. (<i>Macaca arctoides</i> (stump-tailed macaque)-----	6	9	38	57	4	6	4	6	13	20	25	38
(<i>M. thibetana</i> -----	1	2	6	9	1	2	0		3	5	3	5
8. <i>Macaca cyclopsis</i> (Formosa rock macaque)-----	0											
9. <i>M. sinica</i> (Toque macaque) -----	1	2	2	3	0		1	2			2	3
10. <i>M. fuscata</i> (Japanese Macaque)-----	6	9	43	64	6	9	2	3	34	51	9	14
11. <i>Presbytis potenziani</i> (Longtailed langur)-----	0											
12. <i>P. senex</i> (purple-faced langur)-----	2	3	12	18	0		0		4	6	3	12
13. <i>Rhinopithecus avunculus</i> (Tonkin snub-nosed monkey) -----	0											
14. <i>Pan paniscus</i> (pygmy chimpanzee)-----	2	3	9	14	1	2	1	2	3	5	6	9
15. <i>Pan troglodytes</i> (chimpanzee) -----	41	62	146	219	3	5	2	3	32	48	110	171

(Reported to be colony at Southborough RPRC)

cotton-top marmoset there were 23 zoos reporting the species (estimate 32), with 80 individuals (estimate 120), 21 births (estimate 32), and 10 deaths (estimate 15). There were 52 animals five years of age or less (estimate 78) and 28 greater than five years (estimate 42).

Table XIV appears to represent a good index of captive status for the 27 species. These numbers were supported by cross checks with information available in the last International Zoo Yearbook census.

With reference to the 27 animals nominated for inclusion, it would appear that zoos: 1) do not hold 12 species at all, 2) are not placing great demands on wild populations, and 3) are generally producing greater numbers than are being lost.

Among the animals listed, the cotton-top marmoset, diana monkey, mandrill, squirrel monkey, gelada baboon and chimpanzee exist in large enough captive numbers to create potentially self-supporting populations while the cotton-top marmoset, mandrill, and squirrel monkey based upon these trends might possibly qualify as captive self-sustaining.

A further analysis of the squirrel monkey was made with reference to information published in the Federal Register April 19, 1976. Here information was given reporting available data on the numbers of squirrel monkeys imported into the USA since 1968. Because these statements seem to imply that zoological gardens were a primary consumer of squirrel monkeys, it was felt appropriate to analyze available data in an effort to determine just what demands zoological gardens had made on wild squirrel monkey populations. The Federal Register states: "Between 1968 and 1972, over 173,000 squirrel monkeys were imported into the U.S. The totals for 1968 and 1969 were over 45,000, but in 1970-1972 this figure decreased to 25,000-29,000 imported annually." "In 1968 almost half of those imported were used in biomedical research, while in 1969 less than one-fifth were so used; the remainder went to pet dealers or zoos." Using the base here a number of 173,000 and allowing 25,000 imports each year through 1975, we assumed a total import number of 248,000. Allowing 20% of these attributable to medical research, there remains 198,000 imported for purposes other than medical research.

Using data reported in Table XIV and extrapolating current ISIS data back through 1968, we attempted to measure the impact of zoological gardens on estimated squirrel monkey imports.

The following assumptions were used:

- 1) That the established annual death rate (48) would be the same through the past eight years;
- 2) There was no captive reproduction to replace these animals; and
- 3) That established dealer purchases (63) were the same through the past eight years.

Thus, over an eight year period 320 animals died in zoos and 504 animals were dealer purchased.

Assuming no reproduction, a consistent mortality rate of 11% and that dealer purchase was consistent, zoos possibly may have consumed 824 animals since 1968. Assuming an established reproduction rate of 104 births over eight years yields a figure of 832 replacement animals. Thus, one can say that over the past eight years, using the most dire projections with regard to mortality and replacement, zoos have been able to replace the squirrel monkey population out of birth and that consumption from the wild could not be more than .4 to .5% of the estimated wild imports since 1968. In reality, the number is probably far less. A further note is that of the 240 known squirrel monkeys currently held in 108 zoos, 179 originally came from private donations. Summary data for the above analysis is given in Table XV.

TABLE XV.

ANALYSIS OF SQUIRREL MONKEY STATUS IN U.S. ZOOS 1975A. AGE CLASSES

Age Class	Years								Total/
	1	2	3	4	5	6-10	11-15	16-20	
Known	23	31	31	23	27	91	11	3	240
Estimate	35	46	46	35	41	137	16	4	360

B. SEX DISTRIBUTION

	Male	Female	Unknown
Known	91	124	25
Estimated	136	186	38

C. ORIGIN OF ANIMALS

	Known	Estimated
Wild Caught	40	60
Captive Born	69	104
*Unknown Origin	131	196

D. *ESTIMATED AND KNOWN SOURCES OF WILD CAUGHT AND UNKNOWN ORIGIN ANIMALS

	Donations	Dealers	Other Zoos	Breeding Loan	Captive Born
Known	119	42	5	5	
Estimated	179	63	7	7	104

*Unknown origin means do not know if captive born or wild caught.

If zoos are to serve as a modern day Noah's ark assisting in preventing the extinction of some species, it is essential that we define the problems involved and formulate models for management of individual species in captivity which can be used as guidelines for all participants. This area is currently being developed by AAZPA ISIS. The problems to be considered might initially take the form of defining the limitations of the ark. The numbers which can be held or the carrying capacity of the zoo requires definition. This has been provisionally explored by Perry and Kibbee who conclude that the number of species being held must be reduced to provide adequate space for larger self-sustaining populations. A model for demographic properties of the population is essential. A model for maintaining the maximum genetic diversity of populations must be developed. Care must be taken to randomize selection in a manner to avoid either domestication or breeding to a preferred type. It is essential to "freeze" evolution at this point in time and maintain the maximum amount of heterozygosity possible by controlled avoidance of inbreeding. Behavioral programs will need to be developed so that essential parts of the repertoire are not lost. Both management and reproduction must be such that uncontrolled mortality and limited natality are not limiting factors upon maintenance of the population.

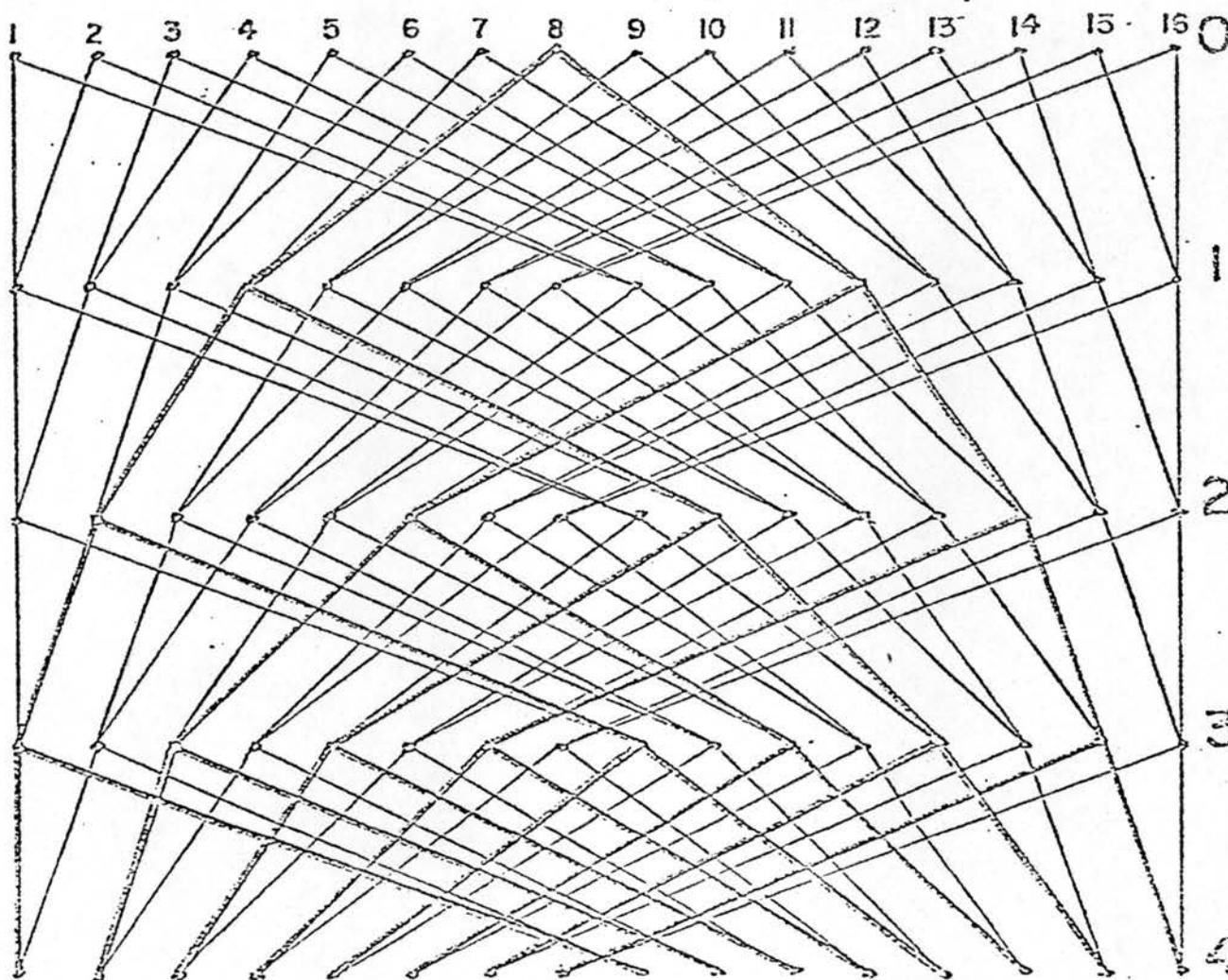
The strategy chosen for maintenance of captive gene pools requires a choice between two alternatives. One might be the deliberate decision to proceed towards domestication of the species. The other would aim to maintain the maximum genetic diversity available in the population. If it is intended to maintain the gene pool for possible reintroduction into the wild, then maintenance of maximum genetic diversity is the necessary choice. This entails avoidance of selection according to any preconceived notions of species type or other sorts of characteristics. Other factors to be considered in avoiding loss of variation include consanguinity resulting from brother/sister matings or back-crosses between offspring and a parent. Also, the number of offspring contributed by a particular breeding individual to the total population must be evaluated. Thus, a single highly successful breeding female may contribute a disproportionate number of offspring to the overall zoo population, resulting in a very rapid loss of genetic variation. This has occurred in several species in this country already. The tendency here is to select a zoo adapted strain.

Avoidance of inbreeding requires the choice of a breeding strategy which is deliberately applied such as the maximum outbreeding method originally proposed by Sewall Wright (1921). This scheme requires that each pair of animals mated leaves equal numbers of descendants, with a 1:1 sex ratio in each generation. Following such a scheme will provide maintenance of the maximum amount of diversity with a minimum number of animals. Thus, a population of 16 animals mated according to this scheme is equivalent to a population of 128 animals with a 1.5 sex ratio and a 1.4 standard deviation of family size with random mating (see Figure 2). Decay of variability for a maximum outbreeding of population sizes 8, 16, 32 and 64 are shown in Figure 3.

FIGURE 2.

ILLUSTRATION OF MAXIMUM AVOIDANCE OF INBREEDING

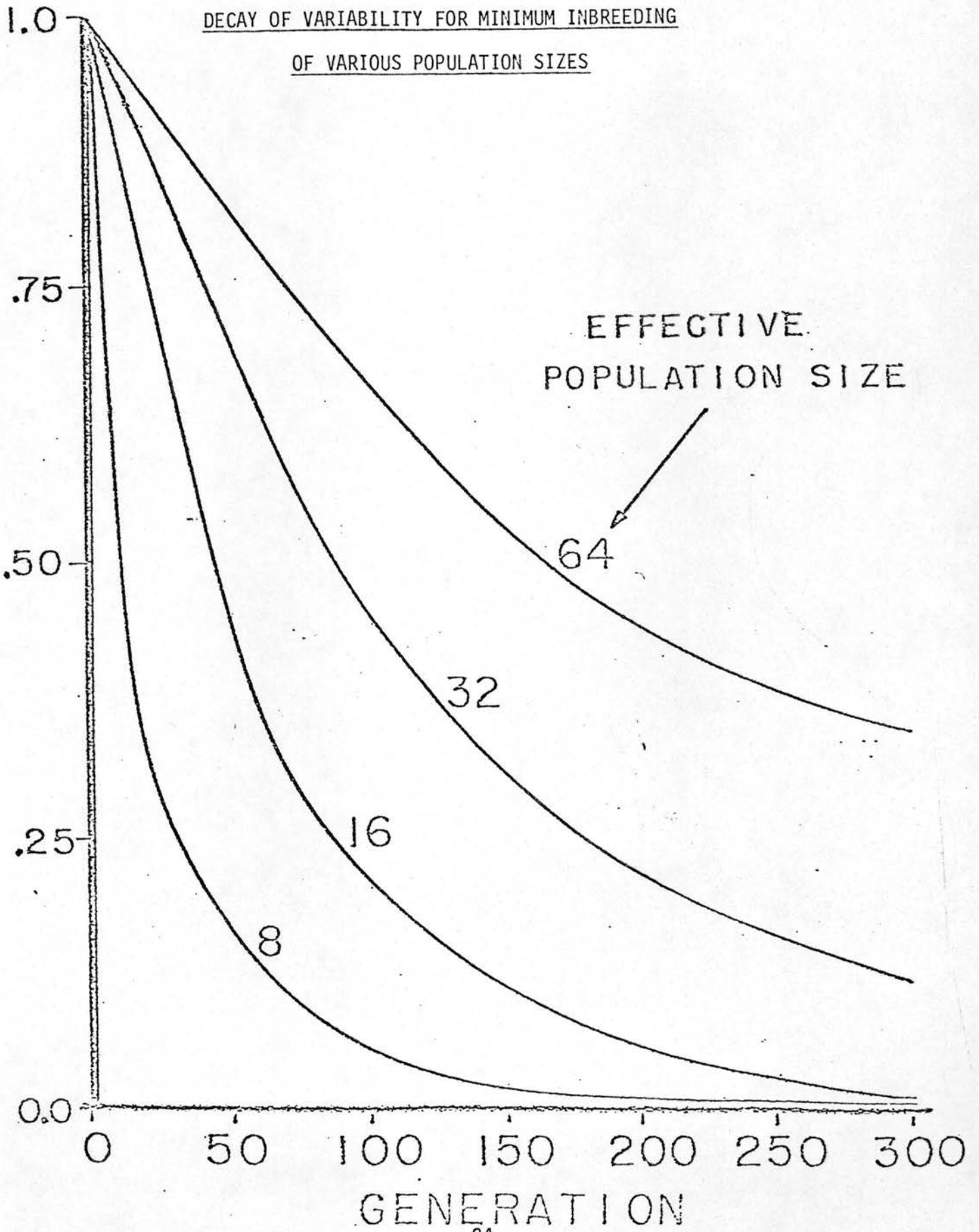
SCHEME UTILIZING 16 ANIMALS OF EQUAL SEX



ZOOLOGICAL JOURNAL

FIGURE 3.

DECAY OF VARIABILITY FOR MINIMUM INBREEDING
OF VARIOUS POPULATION SIZES



Computer programs for evaluation of pedigree data with respect to inbreeding and the risk of inbreeding have been written. Flesness has applied these to pedigree information on the Przewalski's horse, Arabian oryx, and the golden lion marmoset. The result for Przewalski's horse are shown in Figure 4. The inbreeding coefficient is the measure of the degree of success in preserving genetic diversity. Remember that a daughter-father cross yields an inbreeding coefficient of 0.25. The relative risk coefficient provides a measure of the relative risk of a given mating producing offspring with some inbreeding-caused defects. The horse data shown indicate that there has been roughly a ten-fold greater loss of genetic diversity than would have occurred if a maximum avoidance of inbreeding scheme had been followed.

This type of analysis is being extended for those species for which data exists. Such population genetic models can provide one of the two major requirements for developing a policy of captive gene pool management.

Another model required is that of population demography. Models for the Przewalski's horse and Arabian oryx have been examined by Foose. They are based upon the work by Leslie. This method allows estimates to be made of population sizes of particular species projected five to ten years into the future. This method allows the effects of current management on future populations to be evaluated and projected. Example of such a projection for captive Arabian oryx females is shown in Figure 5.

Thus, development of both genetic and demographic models illustrated here can be eventually applied through the AAZPA ISIS program for any species. It will be necessary to develop techniques both for the control of reproduction and to develop a policy for removal, distribution or disposal of surplus stock. Some defined amount of surplus stock will be essential to protect against random losses due to disease and other factors. Control of reproduction in animals that have already made their contribution to the gene pool but are being maintained in the collection can be accomplished by reversible contraception techniques which would allow the return to breeding in case the need arises. American zoos, by applying these techniques, can begin to change from uncontrolled random breeding programs (with dispersal of animals dictated by short-term needs) to the development of long term breeding policy based on genetics and demography. This will provide a basis for making choices on animals to be collected from the wild as a hedge against the complete loss of species, for managing existing species currently held in captivity, and for captive reintroduction programs.

FIGURE 4.

EQUUS PRZEWALSKI

INBREEDING COEFFICIENTS VS. BIRTH YEAR FROM 1899 TO DATE

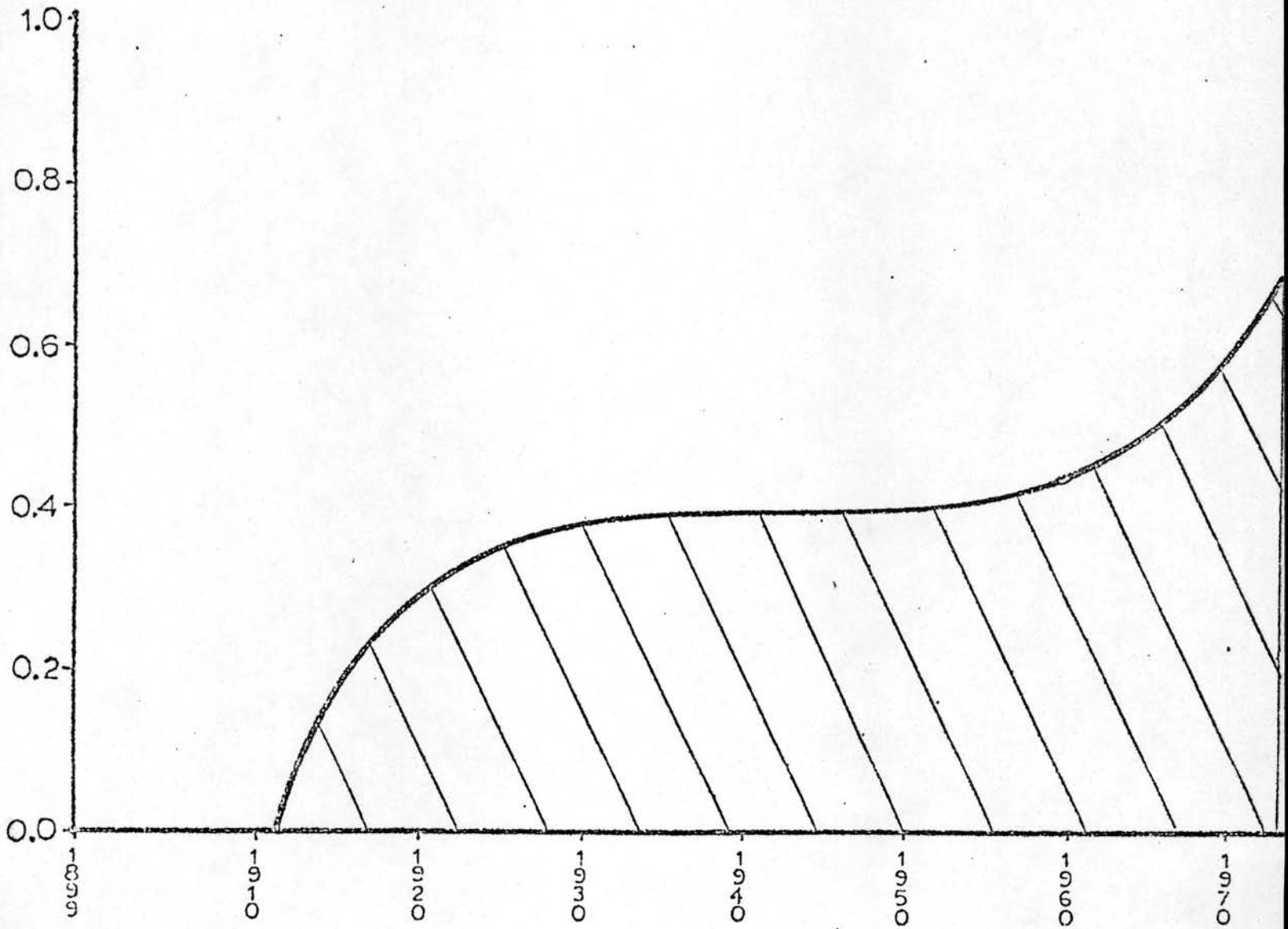
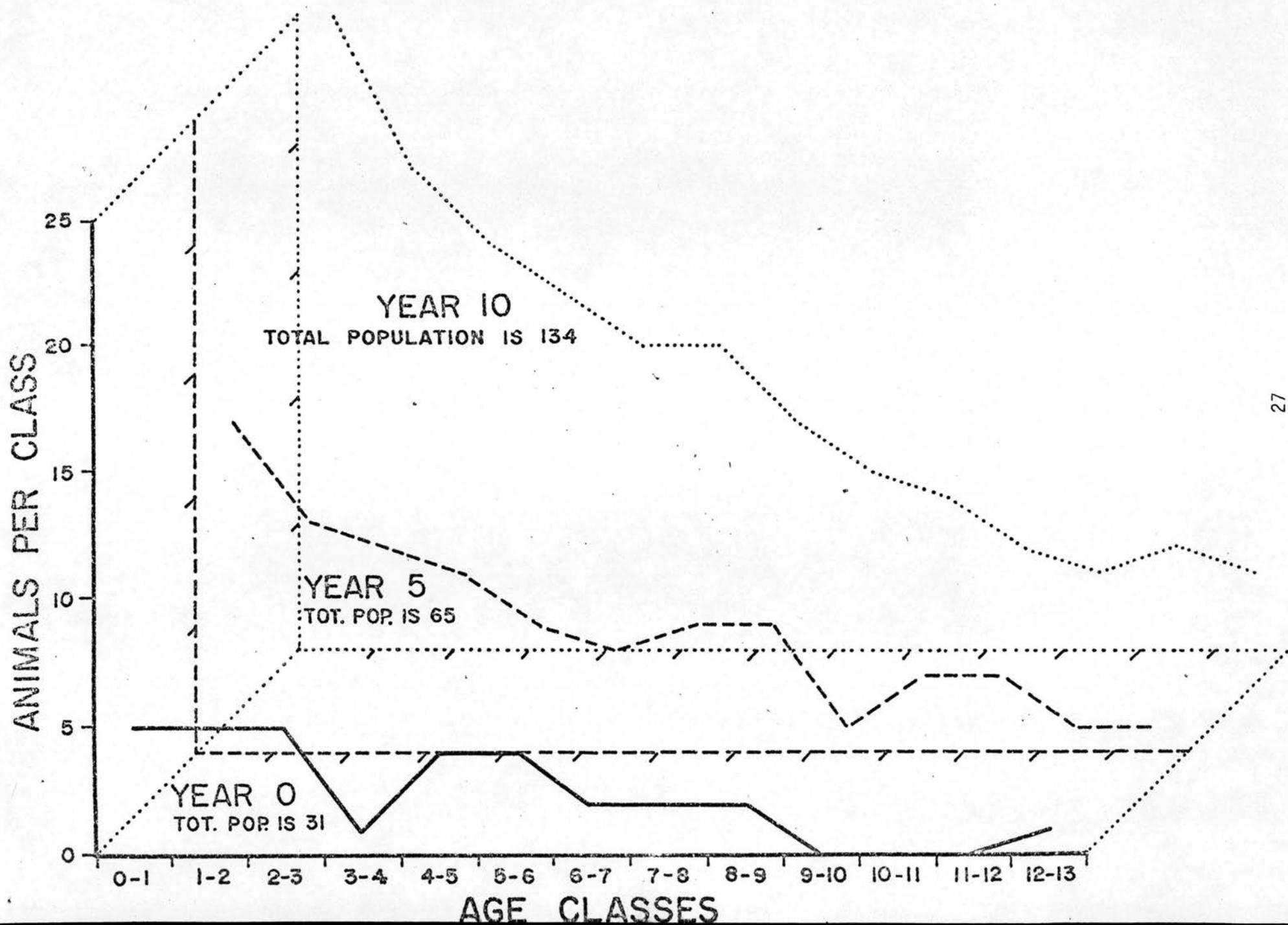


FIGURE 5.

CURRENT AND FUTURE POPULATION PROJECTIONS FOR ♀ ORYX LEUCORYX



BIBLIOGRAPHY

- Bridgwater, D.D., 1972. Status of rare and endangered birds in captivity with a general reference to mammals. Zoologica. 57(3):119-126.
- Conway, W., 1974. Animal management models and long-term captive propagation. Paper to the American Association of Zoological Parks and Aquariums Conference, Philadelphia. Federal Register 41:76, pp. 16466-16469.
- Flesness, N.R., 1976. Gene pool conservation: Breeding for reintroduction. Int. Zoo Yrbk. (In press).
- Foose, T.J., 1976. Demographic models for management of captive populations with application to wild horse (Equus przewalski) and Arabian oryx (oryx leucoryx). Int. Zoo Yrbk. (In press).
- Henny, C.J., W.S. Overton, and H.M. Wight, 1970. Determining parameters for populations by using structural models. J. Wildl. Mgmt. 34:690-703.
- Keyfitz, N., 1968. Introduction to the Mathematics of Populations, Addison-Wesley Publ. Co., Reading, Mass, pp. 41-73.
- Leslie, P.H., 1945. On the use of matrices in certain population mathematics. Biometrika 33:183-212.
- Leslie, P.H., 1947. Some further notes on the use of matrices in population mathematics. Biometrika 35:213-45.
- Leslie, P.H., 1959. The properties of a certain lag type of population growth and the influence of an external random factor on a number of such populations. Physiol. Zool. 32:151-159.
- Miller, R.S., and D.B. Botkin, 1974. Endangered Species: models and predictions. American Science 62(2):172-181.
- Perry, J., D.D. Bridgwater and D.L. Horsemen, 1972. Captive propagation: A progress report. Zoologica 57(3):109-117.
- Perry, J. and P.B. Kibbee, 1974. The capacity of American zoos. Int. Zoo Yrbk. 14:240-247, Vol. 14, N. Duplaix-Hall (Ed), 1974, pp. 240-247.
- Seal, U.S., D.G. Makey and L.E. Murtfeldt, 1976. ISIS: An animal census system. Int. Zoo Yrbk. 16:180-184.

- Seal, U.S., D.G. Makey, N. Flesness, L. Murtfeldt, C.W. Gray, R. Barton, L. Mather, K. Olberding and E.D. Plotka, 1975. The Noah's ark problem. Multigeneration management of wild species in captivity as a means of their conservation. AAZPA Regional Meeting, Omaha, Nebr.
- Simberloff, D.S. and L.G. Abele, 1976. Island biogeography theory and conservation practice. Science 191:285-86.
- Sullivan, A.L. and M.L. Shaffer, 1975. Biogeography of the megazoo. Science 189:13-17.
- Clapp, R.B., 1974. Mammals imported into the United States in 1972. Fish and Wildlife Service, special scientific report - Wildlife No. 181, Washington, D.C., pp. 1-46.
- Clapp, R.B., 1975. Birds imported into the United States in 1972. Fish and Wildlife Service, special scientific report - Wildlife No. 193, Washington, D.C., pp. 1-81.
- Wright, S., 1921. Systems of mating. Genetics 6:111-178.

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I	S	I	S
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File

22 AUGUST 1976

PROGRESS REPORT AND PROPOSALS: UNIVERSITY COMPUTER PACKAGE

PROPOSED TYPES OF ANALYSES

DEFINITIONS OF REPORT TYPES

SAMPLE OUTPUTS

UNRESOLVED QUESTIONS

SIX TYPES OF REPORT ARE INCLUDED:

UPDATE REPORT > ISIS internal use only
 EDIT REPORT

STUDBOOK REPORTS
 PEDIGREE ANALYSIS REPORTS
 DEMOGRAPHIC ANALYSIS REPORTS
 BASIC DATA REPORTS

> Fourteen separately generated reports are in these four categories. Any or all will be produced by one request (one request card) per subspecies.

Ideas, Comments, Suggestions?

Nate

SUMMARY: ISIS REPORT TYPES- - UNIV. COMPUTER (EXCLUDING PHYS. NORMS)

UPDATE REPORT

1. Basic info. on annual update. Number of new records, serious errors, etc. Errors here are such as alpha characters in numeric fields, etc., and are lethal.

EDIT REPORT

1. Sophisticated edit result. Errors such as male sex for animal recorded as someone's mother, etc. Errors here will not be lethal, but will be reported at time of update.

STUDBOOK REPORTS

1. Studbook report, organized by studbook number.
2. Studbook report, organized by institution name.

PEDIGREE ANALYSIS REPORTS

1. Inbreeding and risk coefficients for all animals, Plot of inbreeding over time, evaluation of inbreeding effects on lifespan and fertility.
2. Calculation of inbreeding coefficients resulting from all possible matings.
3. Calculation and plot of parameters relevant to evaluation of strength of artificial selection on population.

DEMOGRAPHIC ANALYSIS REPORTS

1. Calculation of life tables (fertility and mortality) for all data and for last n years data, by sex. (default value of n = 2).
2. Population projection for a and b years (default values are 5 and 10) of numbers and age classes of each sex, based on life table data from last n years (default value of n = 2). Includes population growth rate. Tables and plot.
3. Calculation of birth rates needed to maintain population at current size, and at several other sizes, based on life table data from last n years (default value of n = 2)
4. Evaluation of specified management options, such as lowering fertility by p%, harvesting 20-2 year old males each year, harvesting them just once, etc. Calculation and plotted output of population numbers, age class distribution, for each sex over the next a and b years if management option were used, based on last n years life tables (default values of a=5, b=10, n=2).

BASIC DATA REPORTS

1. Birth seasonality and sex ratio. Report as tables and plots of births by month, overall sex ratio, sex ratio by month.
2. Death seasonality. Report as plot of death % by month, table of actual numbers of deaths by month
3. Population Size and Origins. Report as tables and plot of population size as of 31 Dec. annually, with total, wild born, captive born, and captive F₂ or greater, tabulated and plotted.
4. Number and Origins of New Animals, yearly. Tables and plot of number and origins (total, wild born, captive born, and captive F₂ or greater), for each years new animals.

* Default value: this is the value that will be used for the calculation unless another value is specified.

ISIS: REPORTS

UPDATE REPORT

This report will be generated automatically whenever the University Computed Tape is updated. Basic data such as number of new records, and total now on cumulative tape will be reported. Records will be edit checked for errors such as wrong character type (number in alpha field, or vice versa). Errors detected here will be listed in the report. If errors are detected, the University Cumulative Records Tape will not be updated. Thus errors will require correcting the ISD-stored data, re-extracting with STRATA, and again updating the University Cumulative Records Tape.

Formats and exact content not yet defined.

EDIT REPORT

This report will also be generated automatically when the University Cumulative Records Tape is updated. It will report the results of finer edit checks, such as parents being of the right sex, parent alive at birth (mother), etc. Errors detected here will be reported in the edit report, but will not cause any rejection of records or of the update process.

Formats and Content not yet defined.

STUDBOOK REPORT:

A studbook-like report would be generated for any subspecies. It would be available in either or both of two overall organizations: 1. a list of individuals and associated information, by studbook number, and 2. a list of individuals and associated information, but organized by institution name, alphabetically, and by studbook number within each institutional list.

Usual studbook information, listed below, will be included. Two unusual kinds of information will also be included. One, Studbook Numbers of grandparents will be given for each individual, not just parents. Two, individuals who are parents of animals with studbook numbers, but who do not themselves have one assigned, will be included (Their exclusion from studbooks is due to historical accident, and they are quite important for pedigree analysis. The Orang-Utan Studbook, for example, includes twenty or so animals as parents who are not in the studbook). Such associated animal data would be placed at the end of the studbook, as a separate section.

REPORT CONTENTS

Title page; Latin name to subspecies, date of report, and "STUDBOOK".

List of individuals, by studbook number or last institution. For each individual, the following items:

Studbook Number (if any)

Sex

House Name (latest one)

ISIS Specimen I.D. Number

Studbook Name

Mother (Studbook number, if any; otherwise ISIS No.)

Father (")

Grandparents (")

Birth Date DD/MM/YYYY or whatever is known

Death Date DD/MM/YYYY or whatever is known

Residence(s) Names of institutions and associated acquisition and release dates

If wild born, area of capture, if known, coded either by latitude/longitude or continent/country, however entered on ISIS forms.

STUDBOOK REPORT (cont.)

Unresolved issues:

Studbook format. Traditionally studbooks are one line per animal, with another line for each move. Using an 8½ x 11 format, the computer line printer can put 80 characters across the 8½" page; it can't print the other direction. Our proposed studbook data includes more than the standard, and will take 120 to 190 characters per animal plus about 30 more for each move.

Studbook-like number. In the case of animals associated with a studbook, as explained above, and in the case of subspecies for which there are no existing formal studbooks, some kind of identifying number will be needed for each individual. The ISIS Specimen I.D. Number in conjunction with Institution Code is unique to an individual, but has two drawbacks: one, its' 15 characters long, and using it for the individual, its' parents, and their parents requires 7 x 15, or 105 characters; two, it changes as an animal moves, so the identity of an animals' parent would need to be changed whenever the parent moved.

Alternatively, some 5 digit or less numbering system could be used in both cases. Using a 5 digit code would save (15-5) x 7 characters, or 70 per individual, giving about 120 plus 30 per move. X _____

STUDBOOK NUMBER. New births of studbook species in ISIS participating institutions will appear on our inventory and on the University Cumulative Tape just after the end of the calendar year in which the animals were born. Under current procedure, these animals will not be assigned a studbook number until the studbook keeper does so, sometime later, with even later release as a studbook. Highly cooperative studbook keepers may allow us or the computer to assign new births numbers, and then for the keeper to assign the numbers beyond these to new births of that year in non-ISIS institutions (Devra Kleiman might consent to this). Lower levels of cooperation would leave us with studbook animals on inventory without studbook numbers until roughly the next year, when the numbers might be available and could be added and used to update the University Tape. Irregardless of the level of cooperation, there will be a problem generating up-to-date studbooks.

Studbook data from non-ISIS institutions will need to come from the studbook keeper. It is improbable that this data will be as current as an end-of-the-year ISIS University Cumulative Tape. Depending on the delays, such data could be added later, and studbook reports delayed until then.

ISIS REPORTS

Studbook Format: Below is an 80 character wide typewriter line, and some studbook data in a sample format.

S		ISIS				SIRE'S		DAM'S		BIRTH
STDBK	E STDBK	SPEC	STDBK	SIRE	DAM	SIRE	DAM	SIRE	DAM	DATE
NO.	X NAME	I.D.	NAME							
12345	M CHARLIE	123456	STDBK1	12344	12343	12342	12341	12340	12339	01/01/1900

Leftovers:

DEATH

DATE	LOCATIONS ACQUIRED	RELEASED	
##/##/####	SOMEPLACE ##/##/####	##/##/####	41 more characters, plus 31 per move.

Format possibilities include moving grandparents to a lower line, which could also include the first location data. Further location data could be placed one location at a time beneath this first one.

S		ISIS				BIRTH	DEATH
STDBK	E STDBK	SPEC	STDBK	SIRE	DAM	DATE	DATE
NO.	X NAME	I.D.	NAME				
12345	M CHARLIE	123456	STDBK1	12344	12343	01/01/1900	01/01/1901
SIRE'S		DAM'S		DATE		DATE	
SIRE	DAM	SIRE	DAM	LOCATIONS ACQUIRED	RELEASED		
12342	12341	12340	12339	SOMEPLACE ##/##/####	##/##/####		

SOMEPLACE ##/##/#### ##/##/####

SOMEPLACE ##/##/#### ##/##/####

etc.

ISIS: REPORTS

PEDIGREE ANALYSIS REPORTS.

- THREE REPORTS AVAILABLE. 1. Calculation and evaluation of inbreeding and "risk" coefficients for all animals of a subspecies. Report consists of list of animals by studbook number or other identity, their coefficients; plot of inbreeding coefficients of annual births over all known history; and chi-square type analysis of lifespan and fertility data on the animals to search for possible inbreeding effects.
2. Report consists of inbreeding coefficients that would result from all possible matings among currently living animals.
3. Report consists of calculation and plot of parameters (still under consideration) relevant to evaluation of the strength of artificial selection on the population.

These three report types are 1. similar to what's already been produced, and 2.,3., not yet available as sample reports.

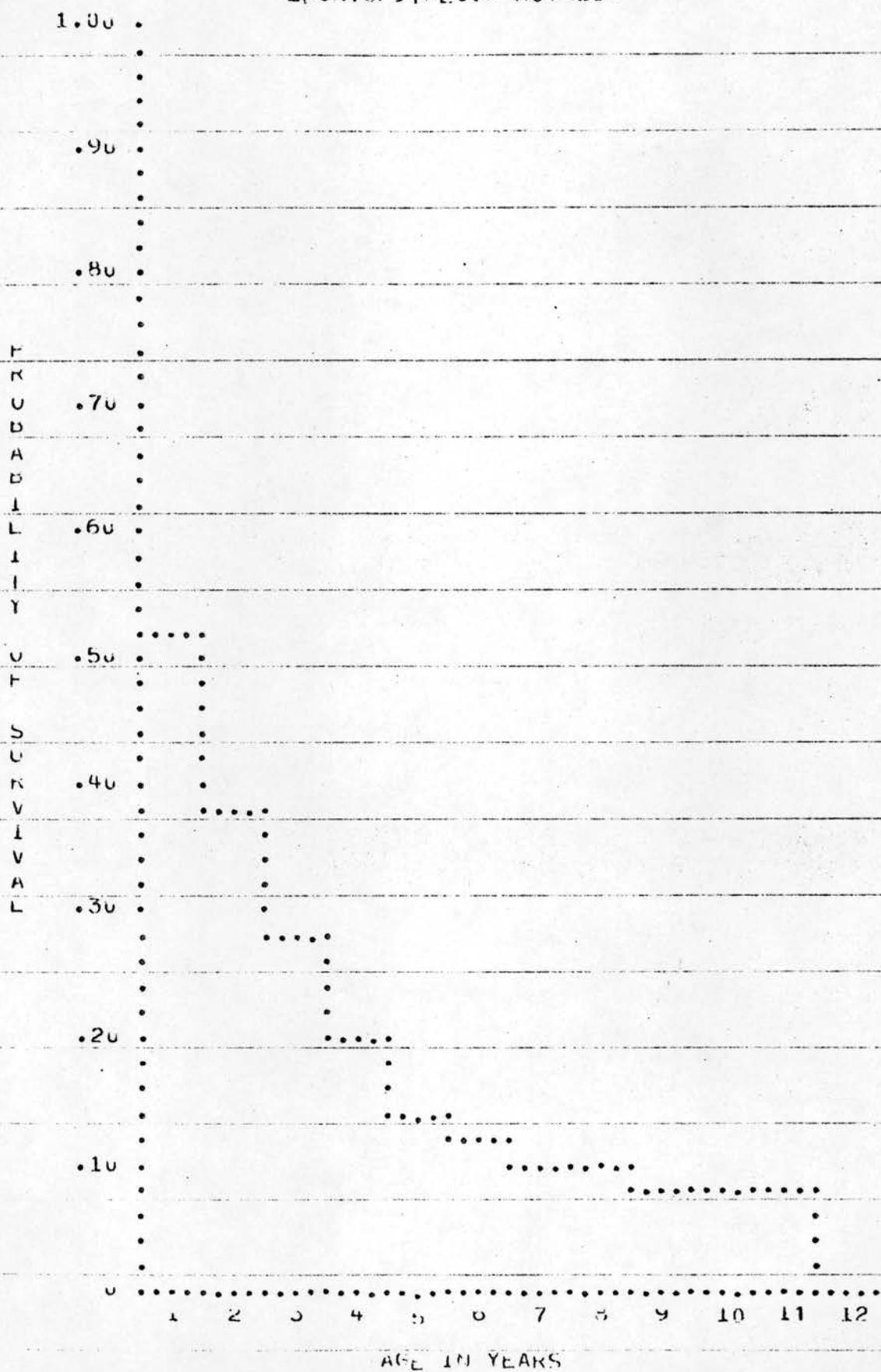
DEMOGRAPHIC ANALYSIS REPORTS.

FOUR REPORTS AVAILABLE.

1. Life tables. Calculation and plot for each sex of fertility and mortality. Report will always include all data, but optionally a second part will be generated that includes only data from the last n years (default n = 2). Sample report for female Leontopithecus rosalia rosalia included. Note that tabulated data as actual numbers will also be included.
2. Population Projection. Calculation of numbers and age class distribution for each sex at time intervals of a and b years in the future, based on last n years life tables and current population age class distribution (default values a = 5, b = 10, n = 2). Also will include overall population growth rate expected. Tables and plotted output report. A sample plot for imaginary data is included here, but is of large format. It will be re-formatted to 8½" x 11".
3. Birth Rate for Zero-Population-Growth. Calculation of required birth rate necessary to maintain population at current size, based on last n years life tables (default value of n = 2). Output as table, will include birth rates necessary for other population sizes (50, 100,200,etc), as well as age distributions that would be attained in such stationary populations. No sample report available.
4. Evaluation of Specified Management Options. Report would consist of population projection like Demography 2., but would represent the populations' expected course if particular management options were exercised, such as annual harvest of p% of the q year-olds of each sex, or the same of just one sex, or just a one-time harvest. This report will probably require an extra control card to be prepared by ISIS personnel detailing the management option.

DEMOGRAPHY. I. LIFE TABLES

SURVIVORSHIP HISTOGRAM, FEMALES
LEONTOPITHECUS ROSALIA



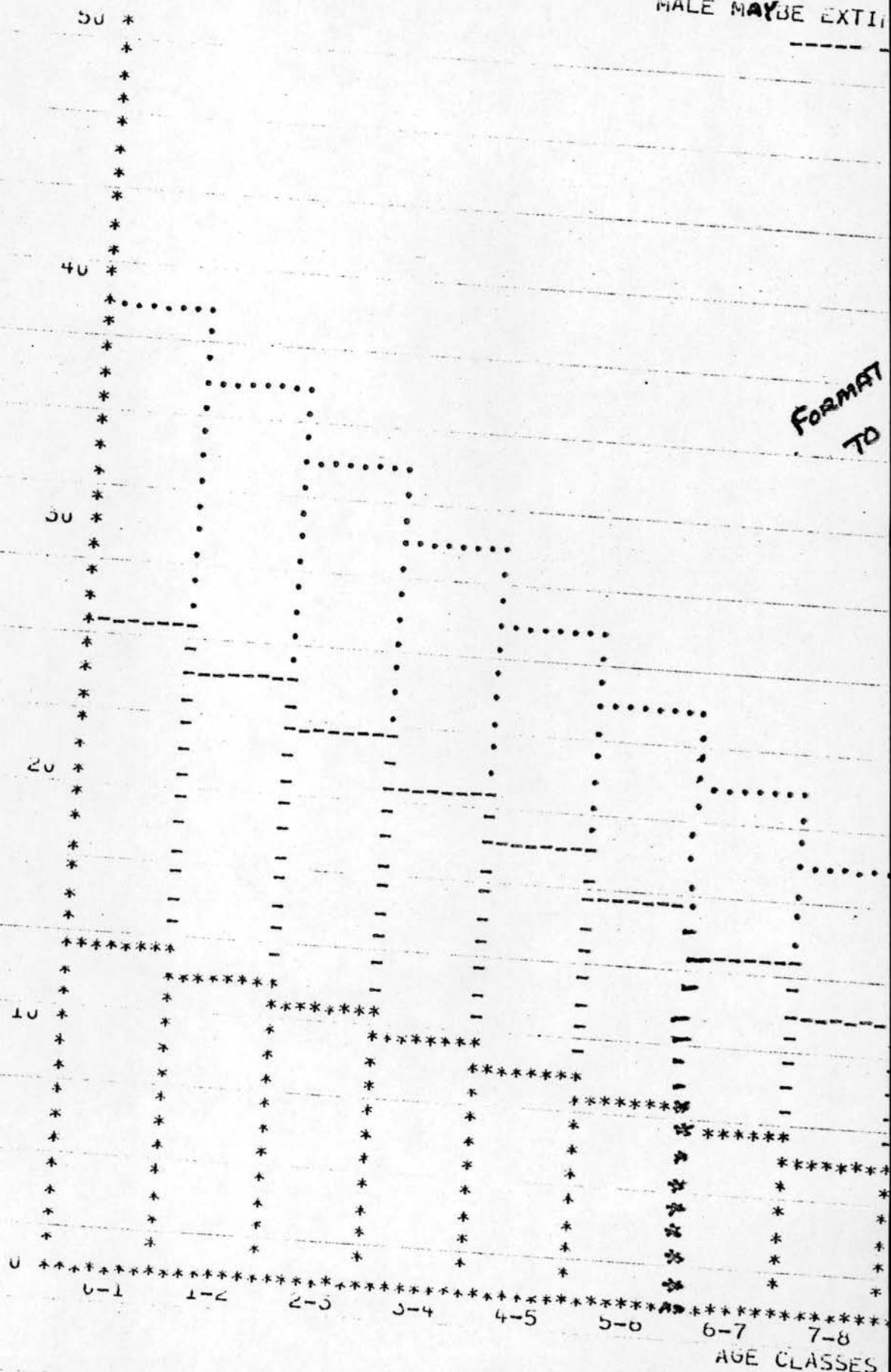
BASED ON ISIS DATA FROM 170 ANIMALS

DEMOGRAPHY. 2.

POPULATION PRO

MALE MAYBE EXTIN

NUMBER OF ANIMALS PER AGE CLASS



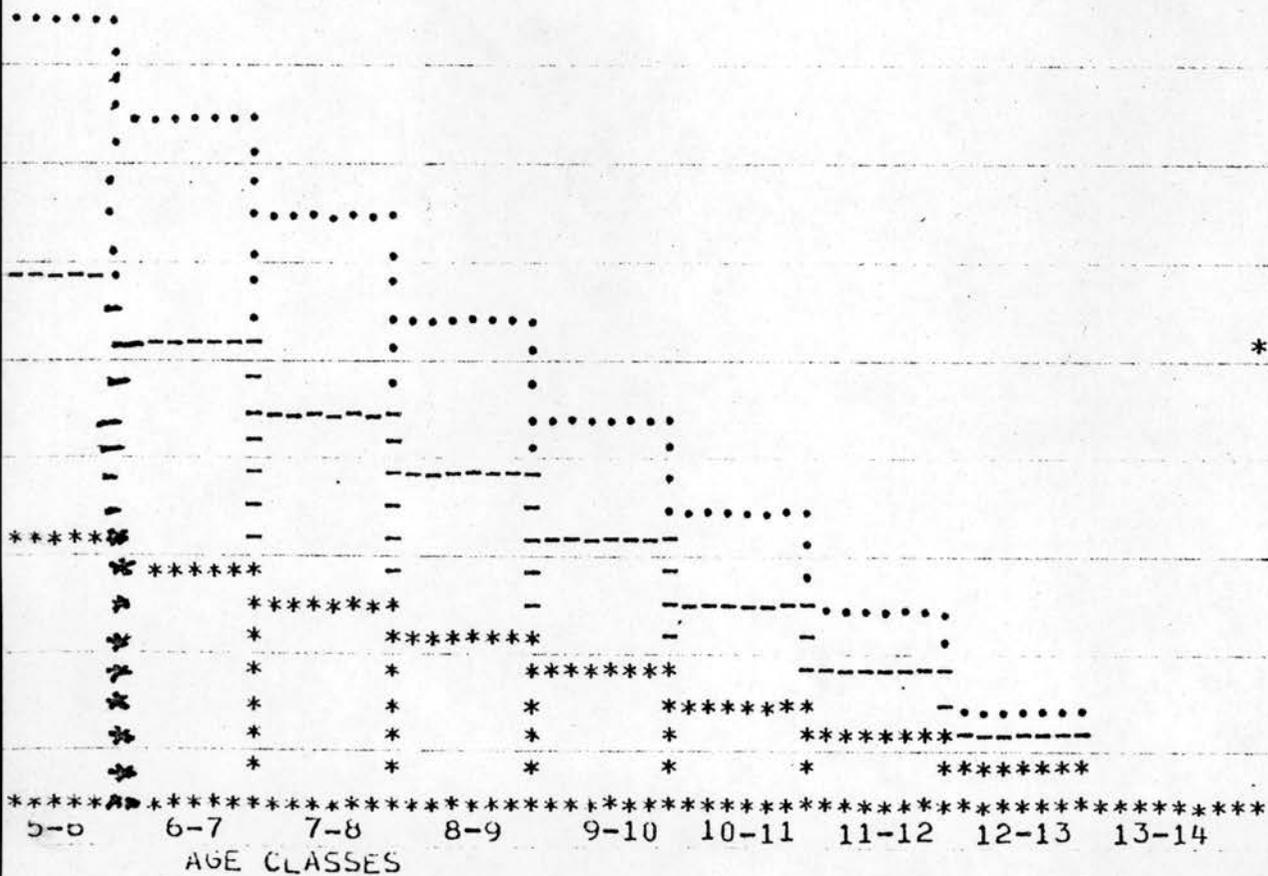
FORMAT TO

***** POPULATION AT 0 YEARS
 ----- POPULATION AT 5 YEARS
 POPULATION AT 10 YEARS

POPULATION PROJECTION

MALE MAYBE EXTINCTUS

FORMAT TO BE CHANGED
TO 8 1/2" x 11"



POPULATION AT 0 YEARS
POPULATION AT 5 YEARS
POPULATION AT 10 YEARS

ISIS: REPORTS

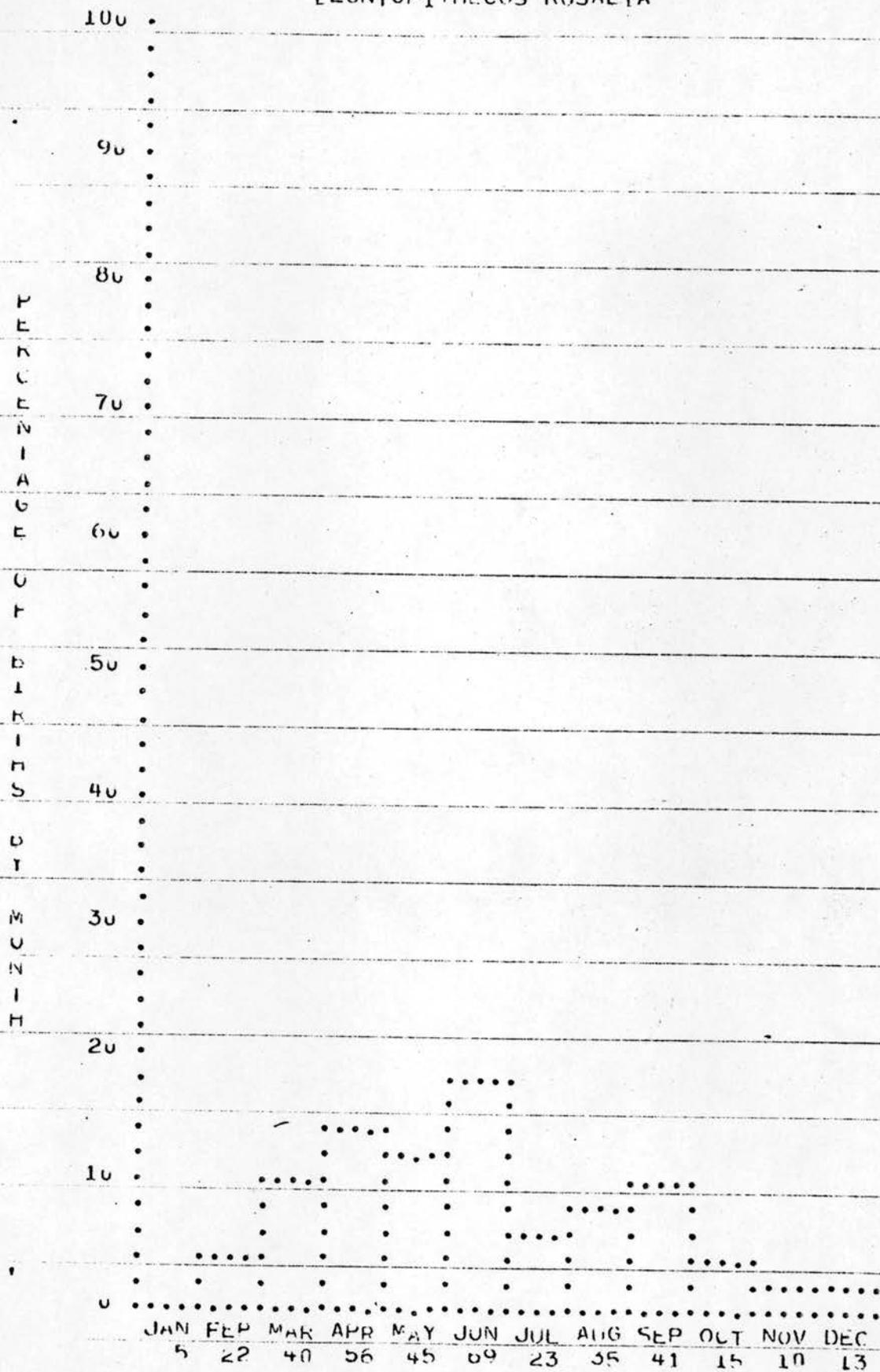
BASIC DATA

1. Seasonality and Sex Ratio of Births. Report consists of tables and plot of births by month, overall sex ratio, and sex ratio by month. Sample report plot included.
2. Seasonality of deaths. Report consists of tables and plot of deaths by month. Format of report like that for births. Crude sample report plot included.
3. Population Size and Origins. Report will consist of tables and plot of population size over known captive history, based on annual census date of 31. Dec. Animals will be broken down into four categories; total, wild born, captive born, and captive-born-to-captive-born-parents (captive F_2). Animals of unknown parentage that are not known to be wild-born, and animals of mixed-type parentage, say one wild parent and one captive, will be included only in the total category. It's important to realize that the choice of census date influences the recorded population size, especially for annual breeders with high juvenile mortality. Such animals will have higher annual population sizes just after the birth season, and the annual population sizes will get smaller the further the census date is from the birth season. Somewhat inaccurate sample plot included here.
4. Numbers and Origins of New Animals, Yearly. Report will consist of tables and plot of numbers of new animals added to the captive population each year for which there is data. Origins of new animals will be broken down into the same four categories as above; total, wild born, captive born, and captive F_2 (or greater than F_2). Sample plot included here.

BASIC DATA, I.

SEASONALITY OF BIRTHS, BY MONTH

LEONTOPITHECUS ROSALIA

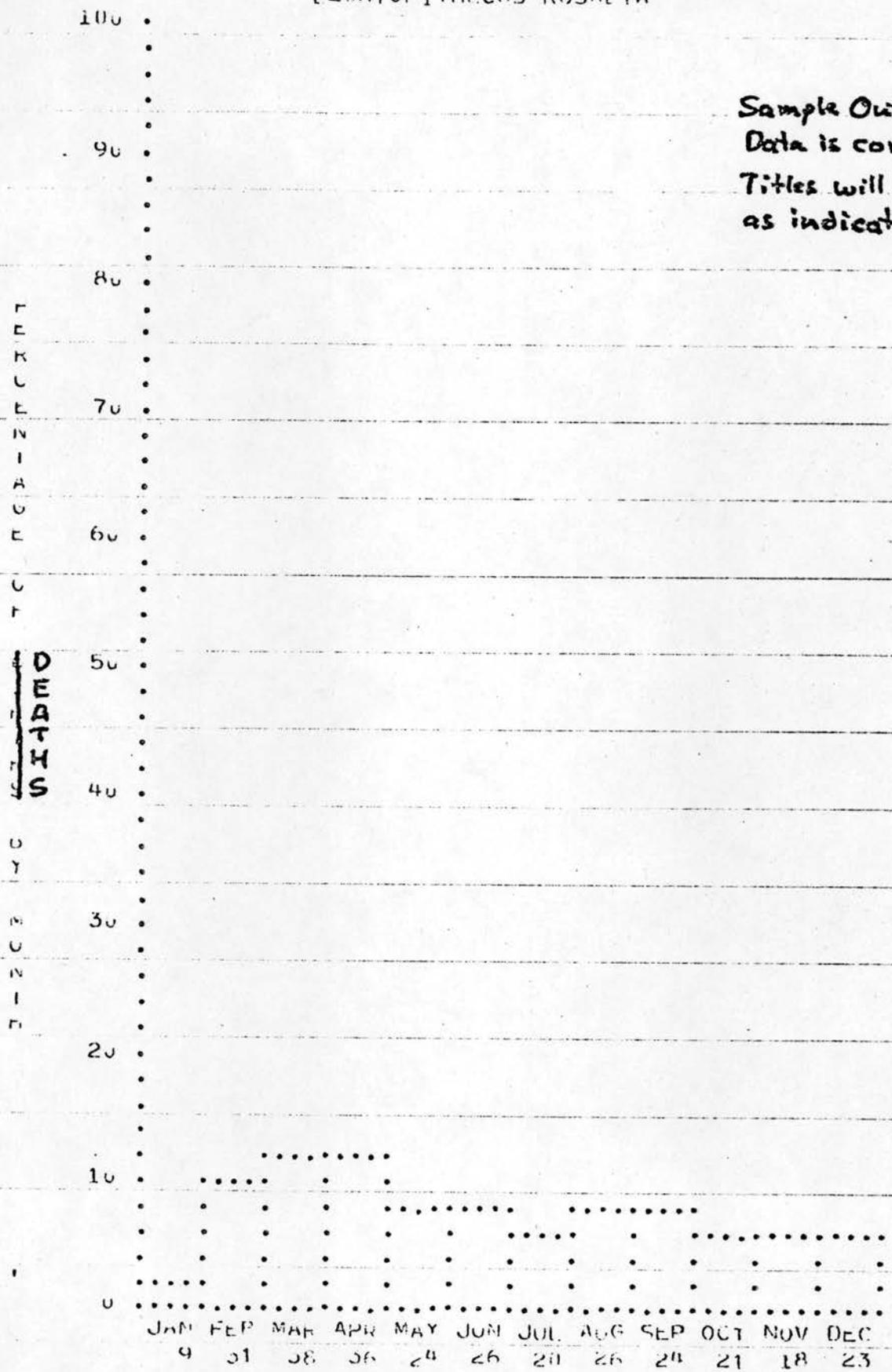


BIRTH MONTH
 NUMBERS UNDER MONTHS ARE ACTUAL NUMBER OF BIRTHS
 IN THAT MONTH (NOTE THAT GRAPH IS OF PERCENTAGES)

TOTAL ISIS BIRTH RECORDS = 374

2. SEASONALITY OF ~~DEATHS~~ DEATHS BY MONTH

LEONTOPITHECUS ROSALTA



Sample Output
Data is correct,
Titles will be changed
as indicated.

~~DEATH~~ MONTH
NUMBERS UNDER MONTHS ARE ACTUAL NUMBER OF ~~DEATHS~~ DEATHS
IN THAT MONTH (NOTE THAT GRAPH IS OF PERCENTAGES)

TOTAL ~~DEATH~~ RECORDS = 200
~~DEATH~~

SIZE AND ORIGINS OF POPULATION BY YEAR

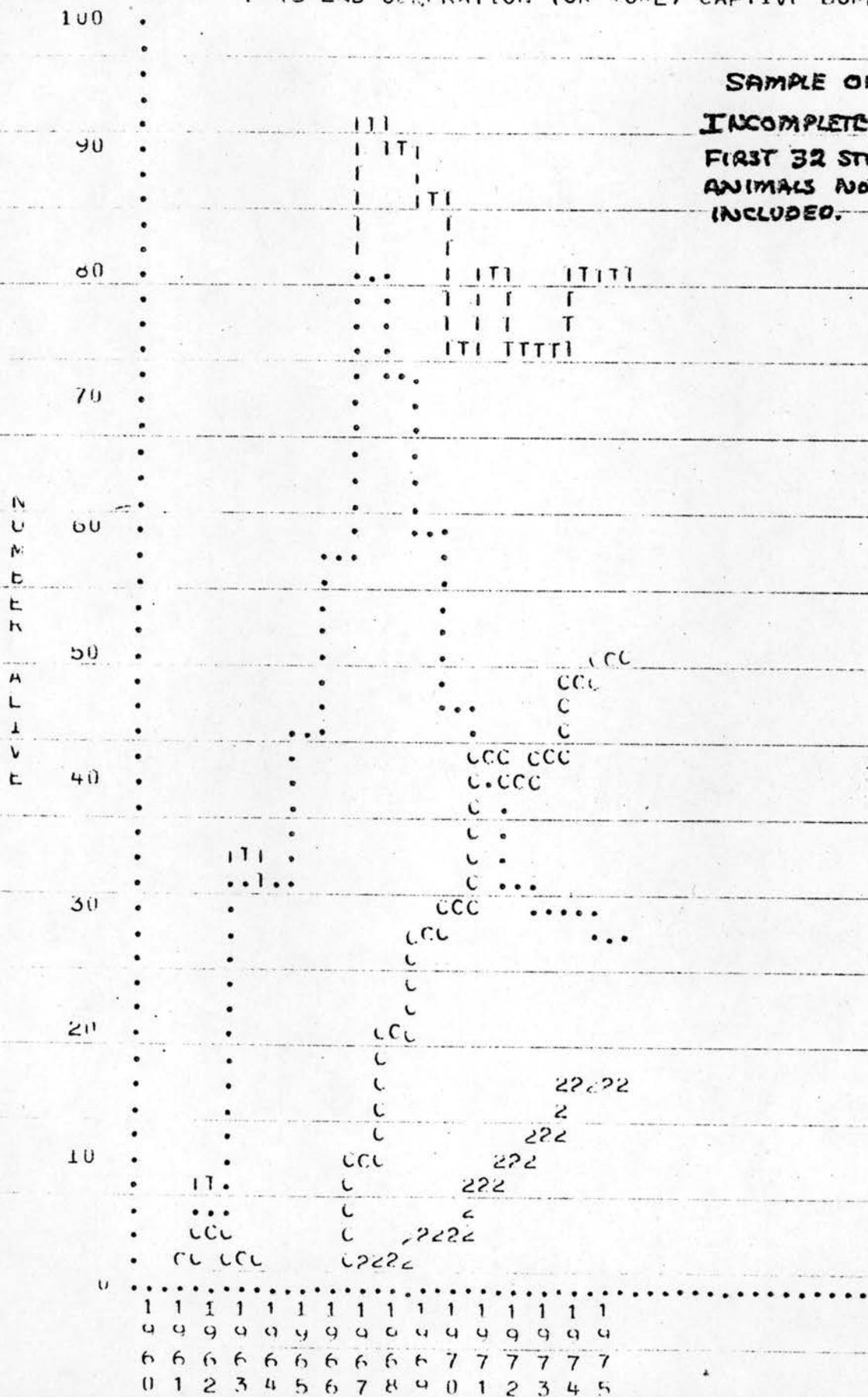
LEONOPTHECUS ROSALIA

T IS TOTAL YEARLY CENSUS AS OF 31 DEC.

. (DOT) IS WILD BORN

C IS CAPTIVE BORN

? IS 2ND GENERATION (OR MORE) CAPTIVE BORN



SOURCES OF NEW ANIMALS, BY YEAR

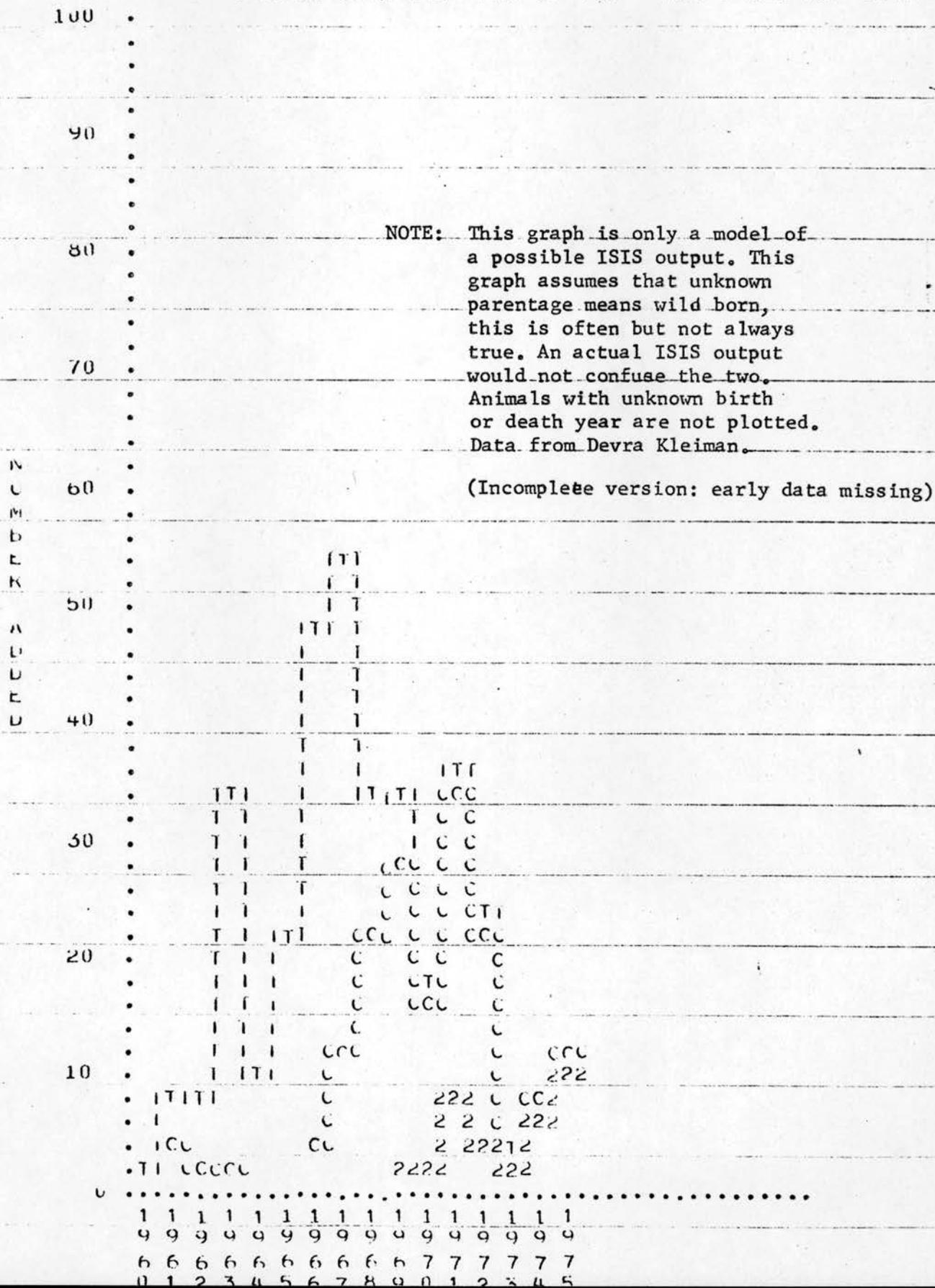
LEONOPTIHECUS ROSALIA

T IS TOTAL NEW THAT YEAR

C IS CAPTIVE BORN

2 IS 2ND GENERATION (OR MORE) CAPTIVE BORN

ANIMALS WITH ONLY ONE CAPTIVE PARENT ARE NOT IN C



ISIS: STUDBOOKS, PEDIGREE ANALYSIS, DEMOGRAPHY, AND BASIC BIOLOGY.

PROBLEM:

These reports will be generated at the University Computer, where ISIS does not have ongoing programming support of the report writing program package. Inevitably, Changes in University Job Control Language (KRONOS) or in the actual programming language (MNF FORTRAN) will occur. These changes are more likely to affect ISIS programs at the job control language level, as effort is being made to use conservative FORTRAN, which has little risk of becoming illegal.

When such changes occur, they may occasionally make part or all of the ISIS University program package unusable. The University provides a list of free-lance programmers who are available to anyone for hire. As the changes necessary to re-activate ISIS programs would be minor, this mechanism should work reasonably well when trouble occurs.

However, if any of these programs are routinely run at particular times, with reports promised to users at a certain date (e.g. Physiological Norms) it becomes important to see if any problems have developed since the last time a particular package was used. Some kind of report check needs to be done 4 to 6 weeks prior to production run, to detect possible trouble in time to allow hiring a programmer and to allow a reasonable time for the programmer to fix the problem. This report check should be designed to use all parts of the University ISIS programs. Its' successful completion should then allow a full production run.

This check system may be considered a separate report type.

INTRA-OFFICE MEMO

ISIS

TO: Don Bridgwater

FROM: Dale Makey

DATE: 11 October 1976

SUBJECT: ISIS Enhancements and Developments

On 5 October 76 John Lennon requested a meeting be arranged as soon as possible to discuss problems and priorities involving the enhancements and developments of ISIS. In retrospect, the session was probably called to reacquaint Cal Adrian, Programmer Supervisor, who has been out of action for approximately eight weeks due to a heart attack. I asked Jan Olsen to attend this meeting to provide input on the day to day operations of ISIS which could be pertinent to the discussion. Below is a summary of the five topics which were discussed at the meeting held on 8 October 76.

1. Reorganization of the "Vital Statistics" Data File

Attempts by ISD to reorganize this file have failed up to this point. Failure has been traced to the "TOTAL" software package which is supported by a private firm - not ISD. Jan Olsen requested a two week delay in reorganization attempts to allow entry of data and generation of quarterly reports. ISD indicated reorganization will be postponed until the reports have been generated.

2. Enhancements

Enhancements previously assigned to Mike Rehmon will be completed by Dorothy Swanson. ISIS will receive a credit for approximately 40 hours of programming charges to compensate for the overrun caused by Mike's unfamiliarity with ISIS.

3. Future Enhancements

A brief discussion of new record types and changes of current editing procedures occurred. This discussion revolved around a set of criteria which Nate, Jan, and I have developed to allow entry of historical studbook data into the current ISIS Vital Statistics Data File. These criteria will be discussed in detail in a report to be distributed later this week.

4. Century Indicators and Historical Indicators

The placement of these indicators on the input data cards and in the internal storage records was discussed. The actual meaning and use of the Historical Data Indicator was discussed with respect to current reports and future reports. Continued programming efforts on the Historical Data Indicator were halted until clarification of usage with report generating programs is completely defined.

5. Future Usage of STRATA

By pure chance, Jan Olsen discovered that the use of STRATA will be discontinued within the next 6 to 12 months. The direct replacement of STRATA will only be able to produce hard copy reports - no magnetic tape copies or extracts of the files. I am currently investigating alternatives to this problem, since both the Phys Norms and Pedigree/Demography were planned using STRATA generated magnetic tapes of ISIS Files.

Dale G. Makey

cc. U.S. Seal
Linda Murtfeldt
Jan Olsen
Kim Hastings

INTRA - OFFICE MEMO

ISIS

TO: Linda Murtfeldt, ISIS Systems Manager

FROM: Jan Olsen, ISIS Development Coordinator DATE: 29 Oct. 76

SUBJECT: Progress Report (24 Sept through 29 Oct 76)

1. INSTITUTION QUATERLY REPORTS

The Quarterly Reports for the San Diego Zoo, San Diego Wild Animal Park, and the Assiniboine Zoo have been run and will be mailed when the fiche is delivered. (Run Cost: approx. \$35, Report Income: \$45, so we essentially break even) The Assiniboine Report contains some errors due to flaws in the Database linkage. ISD has been advised of the problem and will attempt to correct the errors while reorganizing the file. The linkage problem has probably existed since June 1976, when the Taxonomic file was reorganized, but the errors were not detected until the 10 October report was reviewed because no sizable update run occurred in the intervening 3½ months. The problem could not be resolved prior to report generation, but the errors have been noted and explained on the Assiniboine Report.

2. VITAL STATISTICS

Review is currently underway and about 1/3 completed on the Update runs of 10, 13, and 20 October 1976. 11,000 records were submitted in these three runs. In addition, 2000 records are punched, 1500 more are batched, and approx. 2500 more have been received and await batching. Vital Statistics Data will be keypunched, but no further data will be entered into the Database until ISD completes reorganization of the file. Dorothy Swanson will phone by the 5th of November to report on the progress of the reorganization.

3. PHASE 8 SYSTEMS ANALYSIS

The systems analysis for the extensive phase 8 - Enhancements - is being prepared. In addition to the changes discussed at the meeting of Oct. 20, an attempt will be made, at U.S. Seal's request, to define a record type to enter groups of animals as a single entry when there is no easy means of identifying individuals.

4. PEDIGREE, DEMOGRAPHY, STUDBOOKS

No further work will be done on the Horse test data until after the 1976 reports have been run.

Efforts will continue on the Strata programs which will extract the records requiring alteration in order to conform with the new system requirements. Hard copy reports will be produced so the changes can be entered on the printout and thus both deletions and new data can be keypunched from these documents. If possible the programs will be written and tested to allow extraction of data as soon as the file is updated sufficiently for production of the 1976 Annual Reports.

5. VETERINARY RECORDS

No work will be done on the Physiological test data until further notice from Dale.

cc: D. Bridgwater
U. S. Seal
D. Makey
K. Hastings

JO/vu



Post Office Box 551, San Diego, California 92112
Telephone (714) 234-5151
Cable Address: SDZOO San Diego, California, U.S.A.

Zoological Society of San Diego

June 30, 1976

Mr. Donald D. Bridgwater
Director
Minnesota Zoological Garden
Wentworth Office Center
33 East Wentworth Avenue
West St. Paul, Minnesota 55118

Dear Don:

Thank you for your most impressive analysis of the squirrel monkey situation in North American zoos. I would like to also add a Hallelujah! It's cold, hard data like yours from the ISIS program which will, at times, exonerate us so beautifully.

May I urge, as strongly as possible, this data be incorporated in a paper and published, perhaps in the Primate Newsletter of Brown University which is read by almost everyone working with or interested in primates. Possibly there is a better source of publication. Maybe it should be printed in the Newsletter, which is not an official publication as far as literature goes, and also published in a more permanent journal to boot. This is the kind of data we need to get to congressmen and influential people at critical times. It might be worthwhile to incorporate in the paper data on other commonly used laboratory and pet primates - for example, rhesus monkeys and other macaques. Can we get any figures from the government as to importation by species?

Again, thanks for jumping on this problem so effectively.

Sincerely,

Clyde A. Hill
Curator of Mammals

CAH:sal

cc: Mr. Robert Wagner, AAZPA Headquarters
AAZPA Officers and Directors, Conservation Committee

3/17/76

BRAD -

F.Y.I and
return to me.

SB

Thanks Don ~
such a business.
Could we consider
another language than
the Dove? ~~Don~~

the international primate protection league

NEWSLETTER

vol. 2 no. 3 October 1975

PYGMY CHIMP'S TRAGIC DEBUT AT YERKES

The acquisition of 5 Pygmy Chimpanzees by the Yerkes Primate Center, Atlanta, Georgia, USA, has caused such concern among chimpanzee field workers that 36 out of 38 respondents to a petition opposing any removal of this species from the wild had signed within 3 weeks of receiving it. In order to allow readers to make up their own minds about the project, we contacted both supporters and opponents and bring you the following information.

The Yerkes Center, which is under the direction of Dr. Geoffrey Bourne, has the world's largest collection of great apes. As of 1974, there were 16 gorillas, (2 born in captivity), 40 orangs, (18 captive-born), and a large number of chimpanzees.

Until recently, the one great ape missing was the Pygmy Chimpanzee; this primate weighs approximately two-thirds of the weight of the Common Chimpanzee and is confined mainly to the forests south of the Congo River in Zaire. So well-protected has this animal been till now that only four zoos have been able to procure specimens for exhibition. The 1974 *International Zoo Yearbook* lists a total of 16 animals. The International Union for the Conservation of Nature lists the Pygmy Chimpanzee as 'vulnerable to extinction'.

Several powerful research institutions, including the Yerkes Primate Center, have tried to get Pygmy Chimps over the years, but until recently all efforts failed.

The export of Pygmy Chimpanzees from Zaire is banned. However, this did not discourage the persistent US National Academy of Sciences. Finally, an agreement was worked out with the Zaire authorities under which several Pygmy Chimpanzees would be sent to the US on a 'lend-lease' arrangement. The *New York Times* (May 16, 1975) reported that 5 Pygmy Chimpanzees had arrived at Yerkes, but that two infant animals had died shortly after arrival. IPPL wrote to Dr. Bourne enquiring about the project on behalf of interested members. We shall reproduce our questions and Dr. Bourne's answers.

Bourne. With regard to your questions you have to understand that as Director of this Center I have many official queries on various subjects that I have to answer or otherwise deal with, therefore I have to limit the amount of time that I can spend in answering unofficial queries such as yours. Nevertheless, I will make an effort to answer the queries, whatever your purpose in asking them, but in doing so I do not acknowledge that you have any official right to ask them or to expect a reply.

IPPL. Why was the original project which involved a pair of Pygmy Chimpanzees expanded to 5 animals? What were the approximate ages of the various animals?

Bourne. Why five instead of three animals? The Zaire capture expedition which was organized by the Zaire government's Institute for Research in Central Africa (IRSAC) captured five animals and that is what they sent us. We requested only two.

IPPL. By whom were the animals caught? Was any observer

from Yerkes present? Please give a detailed description of the capture technique. Were the infants captured with their mothers? If so, were they separated from their mothers? How was separation accomplished? Why? Where are their mothers?

Bourne. I have answered this above. This was an IRSAC, i.e. a Zaire Government operation, there were no dealers and no commercial activities involved. The first capture operation netted three animals. About a week later two young animals were added.

IPPL. By which department of the Zaire government were the export permits issued? On what date does the lease expire? Is a fee to be paid for the loan? What US agencies were involved in the negotiations?

Bourne. Export permits were issued by IRSAC (Institute for Research in Central Africa) which is answerable directly to the President of Zaire. No date was set for the lease. The animals will remain with us until we have completed our investigations, and it is impossible to say, at this moment, how long this will be. No fee was paid except to an English zoologist, Sinclair Dunnett, who happened to be in Zaire and who took part in the expedition. He was paid a fee to compensate him for his time. The US National Academy of Sciences was the only US agency directly concerned in the project though the US State Department and the American Embassy in Kinshasa were most helpful in the negotiations.

IPPL. What preliminary ecological or behavioral studies were performed in the wild in preparation for this project?

Bourne. A National Academy of Sciences Committee, of which I was a member, visited Zaire in 1973 to consider on the spot the advisability of capturing a small number of animals for study. Zairian sources informed us that there was an unofficial estimate of 150,000 Pygmy Chimpanzees in the wild. I do not know how accurate that is, it is probably an exaggeration. Nevertheless, the authorities in Zaire advised us that there were areas where the animals were very plentiful and this is borne out by the fact that the expedition took only a few days to capture three animals and advised us that if they had stronger nets they could have captured many more.

IPPL. What was the exact cause of death of the two infants? Specifically, what parasites were present? Do you feel the trauma of capture and transportation aggravated pre-existing parasites? Or were the infants likely to have died anyway? Have any further losses occurred?

Bourne. The full autopsy report is in our file, but complete details will not be available until all the histology has been completed. However, the pathologist's provisional gross diagnosis for each animal is given below. [A long list of parasites follows]. Considering the amount of pathology they had the animals survived the trip very well and when I saw them soon after arrival they did not look exhausted. I do not see how these animals could have survived much longer in Zaire. The other pygmy chimps are suffering from Strongyloidosis and one had a severe diarrhea from

it, but we pulled her out of it and all three look very good. The carcasses of the two which died have been sent to the Smithsonian Institution.

IPPL. Are there any plans to transfer any more Pygmy Chimps to the USA? Does the lease provide for the replacement of dead animals or for compensation in this eventuality?

Bourne. There are no plans at present to transfer further animals.

IPPL. The article in the *New York Times* states that the Pygmy Chimp, if truly a closer relative of man than the *Pan Troglodytes*, would make 'the best possible subject for studying human diseases and testing new drugs.' Does this reflect your thinking? Do you feel such a goal to be compatible with your reported goal of conservation?

Bourne. The final protocol has not yet been worked out and will not be until the animals are out of quarantine, but will include studies of the hematology, blood chemistry, blood groups, microbiology, reproductive physiology, behavior, mental level and possibly ability to learn language.

IPPL. What specific studies involving the animals are planned?

Bourne. With reference to the *New York Times* article, I have no plans for, and would resist, bringing Pygmy Chimpanzees from the wild into the laboratory so that they could be used for studying human diseases and testing new drugs. . . . Finally, with regard to the pygmy chimpanzees, I believe the hazards of jungle existence with the short life expectancy that results, is such that the rate of loss of these animals has exceeded the birth rate for some years and they will inevitably die out if positive action is not taken, both to study and preserve them. We need action not talk, and our plans for the Center in Zaire will depend on the former, and they will also depend on the absence of harassment from individuals and organizations who imagine they have a prerogative in animal conservation.

IPPL also contacted various other interested parties and received the following information:

Mr. Julian Engel, (Commission on International Relations, US National Academy of Sciences). The National Academy of Sciences was instrumental in launching the concept of a dwarf chimpanzee breeding colony in Zaire as a base for the eventual establishment of an international center for scientific research in Zaire. . . . The author of the idea is Dr. Carl Djerassi, Professor of Chemistry, Stanford University, and Chairman of the Academy's Board on Science and Technology for International Development. . . . Dr. Djerassi . . . suggested that [an] international scientific enterprise could be established in Zaire centered upon the dwarf chimpanzee as an unexcelled model (subject to confirmation by present studies) for a broad range of biomedical and behavioral research activities. . . . Following the 1971 meeting, the Academy constituted a special follow-up panel headed by Dr. Djerassi which visited Kinshasa and the IRSAC satellite research station at Mabali for a week (16 - 22 April, 1972). . . . the group spent 3 days in Kinshasa and 3 in the field, mainly at the Mabali Station. . . . The estimate of 150,000 Pygmy Chimpanzees was obtained secondhand from Dr. Jacques Verschuren, Director-General of the Zairian Institute for the Conservation of Nature. . . . The information has not been verified, but came to us on good authority.

Dr. Jacques Verschuren, (famous for his work in conservation in general and gorilla conservation in particular, formerly in charge of national parks in Zaire). The figure 150,000 was not given by me. It is completely impossible to give a statistic for this forest species. This number appears too high, in any case. . . . I am NOT in favor of its introduction to the laboratory; that would signify a hunting pressure on a species which must be considered rare. One must attend, first of all, to its PROTECTION. (Comments translated from French).

Mr. Lannon Walker, (Deputy Chief of Mission, US Embassy, Kinshasa, Zaire). The embassy did facilitate the arrangements for shipping the chimpanzees from their original habitat in Equateur Province to the Yerkes Primate Research Center. . . . The fact that the 5 chimpanzees arrived safely in New York after their trans-oceanic flight was confirmed for the Embassy by telephone from the Department of State on March 27, 1975. However, I am unable to inform you further of the chimpanzees' health once they were delivered to the Yerkes Institute. . . . I wish you success in your program to conserve and protect endangered species.

Field worker. Even though there is apparently no danger of the immediate extinction of *Pan Paniscus*, I was personally very upset by the NAS project. They managed to bypass the laws against exporting Pygmy Chimps from Zaire by collaborating with high officials in the government, with, I might add, substantial help from the American Embassy. If the laws were bypassed once, how much easier will it be to bypass them again?

J. Grant Burke, (Environmental Affairs Officer, Department of State, Washington, DC). The State Department has, in the past, occasionally cooperated with those attempting to obtain animals for legitimate use.

Dr. Adrien Kortlandt, (veteran chimpanzee field worker). Only 40% deaths seems a quite satisfactory figure, as compared to the Laboratoire Médical at Stanleyville in 1959 - 60, where ALL the 86 *Pan Paniscus* chimpanzees captured for the poliomyelitis and arteriosclerosis programs died within 3 weeks.

A second Chimpanzee field worker. The huge tracts of the Congo basin forests which are inhabited by the Pygmy Chimpanzee are not being cut for timber to any extent. The only significant hunting is the bow-and-arrow type, mainly by pygmies, which I do not get too excited about. . . . As to Bourne's comment that the chimps would have died anyway, I think it is so much hot air. Most animals in the wild carry a host of parasites which do not affect them in any way in their normal living. But the acute stresses involved in capture, shipping, etc. with the consequent physiological trauma, generally result in the parasites getting the upper hand. . . . I cannot imagine how anyone could make a guess about the population of Pygmy Chimps: I would say that the figure of 150,000 is sheer fantasy.

A third Chimpanzee field worker. Without an extensive population survey, it is really anybody's guess as to how many Pygmy chimps exist in Zaire. As far as I know, neither Dr. Bourne nor Dr. Engel has set foot in a rain-forest in Zaire nor have they sent anyone else to make a survey.

Another Field Worker. I consider the plans for the conservation of the species by Dr. Bourne, Yerkes and the NAS absurd - worse than absurd. They plan to set up a «reserve» - a fenced-in reserve near Lake Tumba. They plan to have not only *Pan Paniscus* (Pygmy Chimpanzee) there, but also to transport *P. Troglodytes* (Common Chimpanzee) and *Gorilla* spp. there. In my view the more that more species are snatched out of their natural habitats and transported elsewhere, the more harm is done to the individual animals and the species as a whole. If the people at Yerkes were truly interested in preserving *Pan Paniscus* as they claim to be, they would use their funds to set aside sanctuaries in their natural habitat where they would be relieved of hunting pressure and could be studied.

Mr. Philip Handler, (President, US National Academy of Sciences.) [The private owner of 5 Pygmy Chimpanzees] who was leaving Zaire permanently, was willing to make them available to Yerkes. . . . Delays in Kinshasa resulted in the owner of the animals not obtaining the requisite export papers. . . . He left and was able, nonetheless, to take his animals with him. Upon enquiry with the Bureau of Sports Fisheries and Wildlife, US Department of the Interior, the Academy was informed that in the absence of proper

export papers from Zaire, the Lacey Act prohibited the importation of these animals into the United States The Academy was not in any way associated with an effort to obtain dwarf chimpanzees on the black market The lend-lease arrangement for the study of these Pygmy Chimpanzees is not an arrangement to circumvent Zaire's export ban.

Dr. William McGrew, of the University of Stirling, Scotland, acting independently, recently drafted a petition which he has sent to over 75 present and former chimpanzee field workers. The petition deplors the Yerkes acquisitions as detrimental to the long-term interests of the species and expresses strong support for the maintenance of Zaire's export ban on Pygmy Chimpanzees. It urges laboratories, zoos, and other institutions not to procure Pygmy Chimpanzees and proposes that any project based on removal of Pygmy Chimpanzees from the wild be reconsidered, preferably being abandoned in favor of the establishment of adequate and secure sanctuaries for the species in its natural habitat. As of August 18, 36 of 38 respondents had signed the petition.

There are two inherent contradictions in the Bourne-NAS position which should be resolved before any translocation of Pygmy Chimpanzees is undertaken, in order to satisfy the many people who are not convinced this is a *bonafide* conservation project. Bourne and NAS quote a figure of 150,000 Pygmy Chimpanzees in the wild, implying that capture of a few won't harm the species. Yet, on the other hand, we are told by Bourne that the species is dying out of natural causes and requires 'help'. One wonders how these poor, disease-ridden creatures managed to evolve and survive alongside *Homo Sapiens* before the latter ever invented primate research! There is absolutely no evidence that the species is dying out and the argument that it appears to be an unscientific rationalisation. IPPL takes the position that, if the Pygmy Chimpanzee is rare, it should indeed be left alone; but, even if it relatively common, it should likewise be left alone. Many factors contribute to a satisfactory conservation situation, including legal protection. Therefore, it would be unwise to take away this umbrella. In any case, translocation is not performed by waving a magic wand, and the darting, netting, transportation, and separation involved would necessarily involve losses of animals.

THE SINGAPORE CONNECTION

In June 1975, IPPL sent to the United States Department of the Interior a formal request for an investigation of the role of Singapore as a smuggling center for the protected primates of its neighbor countries. We pointed out the large volume of orang-utans, gibbons, siamangs, and other primates traded through Singapore in the 1960s and 70s, although the wild primate population of Singapore consists of only a few Crab-eating Monkeys. We noted such discrepancies as the import of 42 "Singapore Siamangs" to the USA in 1971, a year in which only 6 siamangs (4 dead at birth or in infancy) were born in world zoos, and when Singapore itself had no zoo. Any suggestion that 42 siamangs were born in secret breeding-places in Singapore appears frivolous to IPPL: it is clear that these animals were smuggled to Singapore from neighbor countries: possibly in fishing boats, coastal freighters or false bottoms of trucks, all favorite smuggling methods.

IPPL suggested that such trafficking violated the US Lacey Act which makes it illegal to import wildlife in violation of the laws of ANY country. Interior's reply, dated August 7, indicated that Interior "shared our concern", and was determined to prosecute ALL violators of US laws. However, although the Department admitted that US law allowed authorities to REQUIRE importers to show that they had violated no laws in procuring wildlife, Interior admitted that it has a policy of admitting any animals with Singapore 'export permits', and that it has never made a single seizure of any primate shipment with Singapore documents.

Singapore shows no signs of responding to pleas to curtail this sordid trade and refuses to sign the International Convention on Trade in Endangered Species.

The second contradiction lies between Bourne's rejection of the Pygmy Chimp as a medical guinea-pig and Djerassi's reported view of the species as an unexcelled new disease model. Until a clear statement is made about its future course, conservationists and animal-lovers have every reason to be suspicious of the project as these two statements are totally incompatible. IPPL is investigating a report that a leading pharmaceutical company has contributed several thousand dollars to the project: this, of course, if confirmed, would increase fears that there is more to the project than conservationist sentiments Bourne is due to retire soon, so much would depend on his successor's sentiments. In any case, once the animals are assembled and critics disarmed, the project might well change direction.

IPPL hopes this project, both in its export aspect and the planned Zaire Primate Center, will be reconsidered. Countries which have pioneered strong protective measures for their wildlife should be encouraged to continue this policy rather than being persuaded to make exceptions in favor of very specialised interests. (If funds were freely available, they might better be used for improvements or redesign of the tiny cages in which most of the captive primates at Yerkes live). The wide publicity which necessarily attends the procurement of Pygmy Chimpanzees is very likely to start a fad for the species in zoo and research circles with repercussions back in the habitat. More and more efforts are likely to be made to get hold of specimens with the attendant pressures to weaken legislation and undermine Zaire authority. Increased smuggling and corruption might follow. Large monetary incentives could rapidly ruin this species the protection of which seemed secure until now. It would also be likely that hunters and traders, hearing that the Zaire Center wanted Pygmy Chimpanzees, might bring in animals caught by mother-killing, an economic incentive being provided which could be disastrous for the species.

IPPL strongly supports Dr. McGrew's proposal that, rather than a project involving capturing Pygmy Chimpanzees for relocation, a reserve with a natural population of Pygmy Chimpanzees should be established where observational, non-manipulative studies could be undertaken.

Interior's and Singapore's attitudes are sad news for the primates, and for Indonesia, Thailand, and Malaysia, the major victims of this illicit traffic, all of which have long sea borders and are in no position to check every fishing-boat that leaves their shores. The contents of Interior's letter are also sad news for all who care about the survival of rare and endangered primates. However, the Singapore smugglers and the US importers who have operated the 'Singapore Connection' for years unhampered will rejoice at Interior's announcement and the prospect of the revenue that will flow in from steady streams of 'legal' smuggled primates. A particularly nauseating aspect of the Singapore traffic is that much of it consists of infant primates caught by mother-killing. Interior's "policy" and Singapore's rapacity have combined to condemn hundreds of mother and infant orang-utans, gibbons, and siamangs to senseless deaths, as well as countless other primates; in addition, many primates have been shipped from Singapore to Europe, Canada and other countries, few of which have any anti-wildlife smuggling legislation whatsoever. The purpose which inspired the US Lacey Act was the prevention of just such transactions: if the Act has any loopholes, they should be closed not exploited.

Efforts to end this situation will have to be made at both the Singapore and US ends. If "gentle persuasion" fails, IPPL is prepared to propose to other animal welfare and conservation groups a tourist boycott of Singapore until it mends its ways. Singapore earns considerable foreign exchange from free-spending tourists and the most likely way to effect change would be to hit the country in its pocket-book.

ENDANGERED SPECIES PERMITS FOR PRIMATES

Shirley McGreal

The purpose of the US Endangered Species Act of 1969, revised in 1973, is to restrict the trade in wildlife threatened with extinction. A list of Endangered Species was announced in December 1970. Primates listed include gorillas and orang-utans, (but not chimpanzees and most gibbons), all Malagasy primates, all uakaris, and some species of colobus, macaques, mangabeys, langurs, marmosets, tamarins, and spider-monkeys. Trade in all these species is in most cases banned.

However, two categories of permits were established which make permissible transactions otherwise illegal under the Act. They are:

1. a) **scientific purposes:** valid purposes are not defined and there is no clause stating that the animals may not be sacrificed. (IPPL's position is that no endangered primate should be used in work of a terminal nature or such as might have an adverse effect on its health, well-being or reproductive capacity.)

b) **propagation purposes:** permit applicants in this category were to demonstrate that their plans would contribute to the conservation of the species in question.

2. **economic hardship:** if a dealer could prove that he had made a contract for an animal prior to its listing as endangered, he could be granted a permit on the grounds of the economic hardship caused by the loss of the business: no criteria of what constituted economic hardship were established. (Hundreds of economic hard-permits have been issued for leopard-skin coats and leopard trophies.) This clause is clearly the reflection of a profit-oriented society and the power of vested interests since economic hardship is neither a relevant nor a valid factor when species survival is at stake.

No permits were issued for emotional hardship in cases where a family living overseas had possession of an endangered primate prior to the passage of the Act and wished to bring it back on returning to the US.

Files relating to the Endangered Species permit applications are kept at the Department of the Interior's Division of Law Enforcement, 1612 K St., N.W., Washington, D.C., and they are open to public inspection. An examination of their contents reveals a pattern under which the interests of the wild animals are frequently subjugated to the interests of animal dealers and institutions. Illustrative examples follow.



Mouse Lemur

LEMUR PERMITS

The island of Madagascar has unique primate life and species have survived there which have long since disappeared from the mainland of Africa. Among the permits issued for lemurs were:

ES 11: August 12, 1970. Carl Hellmann of the **Maryland Research Institute**, sought permits for 1 Black Lemur, 1 Red-fronted Lemur, 1 Crowned Lemur, 3 Ruffed Lemurs, and 3 Sifakas.

Since nearly all these species are listed as threatened with extinction by the **International Union for the Conservation of Nature (IUCN)**, outside opinions were sought on the desirability of issuing this permit. Dr. Robert Yarger, of the **US National Academy of Sciences**, said, «we recommend that the requested permit be disapproved.» Dr. Theodore Reed, Director of the **US National Zoological Park**, noted Hellmann's successes with lemurs but pointed out that the **Maryland Research Institute** was not affiliated with any recognised scientific or educational institution, and that the sole staff member was Hellmann, an engineer with no formal training in the biological sciences. He concluded, «I cannot recommend Mr. Hellmann for the scientific or educational maintenance and propagation of these animals.» Dr. Richard Thorington, of the **National Museum of Natural History**, in Washington, noted that, although the Center had existed for 15 years, nothing had been published: he opposed issuance of the permit. Henry Goodwin, Chief of the **US Office of Endangered Species**, opposed the permit; while praising the Hellmann facilities, he did not see the Institute as contributing to scientific knowledge and noted: «he [Hellmann] maintains no staff of qualified research personnel, seeks no guidance, and has established no provision for maintenance of the colony or continuance of his work.»

The Chief of Permits, Mr. B. Palas, inspected the facilities: he found them clean and noted that the 24 lemurs and 8 galagos appeared to be in good condition: however, he found Hellmann «indefinite» and «noncommittal» on other questions. Hellmann was reported as stating that, «if the Bureau actions conflicted with his plans, he would seek redress from the courts.» When Mr. Palas pointed out to Mr. Hellmann that responsible management required a caretaker or backup man for the facility, Hellmann replied that he was self-sufficient, but that his will covered the eventuality, as the animals were to go to the National Zoo in Washington. Dr. Reed, Director of the Zoo, was contacted a few days later and was unaware of the will. IPPL wrote to Hellmann at the address on the permit: when no reply was received, we contacted Dr. Reed, who kindly looked into the situation and tried to track down Hellmann and the lemurs. Dr. Reed comments: «we can find no current address, no active telephone number for him. In fact, we have drawn a complete blank. So far as we are concerned, the man seems to have disappeared from the face of the earth.» Dr. Reed promised to continue his search and communicate the results to IPPL.

Incredibly, in spite of unanimous advice against this permit, it was issued. No precise data on past imports to the Institute and their origin, nor of colony births and deaths, appear in the files, nor is there any history of breeding efforts in other institutions: such data would be an absolutely essential prerequisite to determining whether the issuance of the permit would, in fact, be enhancing the survival chances of the species in question or not. In the case of the sifakas, this is highly doubtful, since, according to the **Red Data Book**, these animals generally do not survive long in captivity and only exceptionally reproduce.

ES 19: November 20, 1970. This was a «propagation» permit and was issued to the **San Diego Zoo** for 4 Ruffed Lemurs, 4 Red-Fronted Lemurs, 4 Red Ruffed Lemurs, 2 Ring-Tailed Lemurs, 6 Mouse Lemurs, 3 Sifakas, 6 Sportive Lemurs and 6 Gentle Lemurs.

IPPL sent an enquiry to Clyde Hill, Curator of Mammals at the San Diego Zoo. Hill replied:

[In 1965 I was] given permission by the Malagasy government to capture and transport a number of species while I was in Madagascar.....The expedition was successful and formed the nucleus of our excellent program in breeding lemurs. When I left Madagascar in 1965, it was agreed by the government that all confiscated pet lemurs would go to the San Diego Zoo and, between 1965 and 1969, a few trickled in. Then the Endangered Species Act came into being. We appealed to the US Department of the Interior for an open-end permit to continue receiving confiscated animals. Permit ES 49 was issued. We did not receive a single animal under this permit. There was a change of government and everything came to a standstill.

Apparently, the 1965 lemur procurements raised quite a storm, as Hill informs us:

It was interesting in 1966 to see a large outcry from the self-appointed watchdogs in the zoo world and outside, of our 'lemur-smuggling' operation. I suppose this stems from the fact that almost every other lemur in captivity had been obtained by smuggling. When I was in Madagascar, a shipload of 40 lemurs was confiscated by the government as it was leaving the island.....All of this hullabaloo resulted in an official investigation of us by the IUCN which was dropped when we sent photostats of our permits.

ES 37: January 2, 1971. This permit was issued to Dr. Buettner-Janusch of Duke University for one Red-fronted Lemur and two Ruffed Lemurs. What makes this permit interesting is Dr. Buettner-Janusch's statement that he was already in possession of 150 lemurs, 50% imported from Madagascar, making this colony, along with that of the Oregon Primate Research Center, also numbering over 150, one of the two largest lemur collections in the world. Many tropical countries make exceptions to their wildlife protection laws for research, and these exceptions have been much used (and frequently abused).

ES 38: January 15, 1971. This permit allowed the Gladys Porter Zoo, Brownsville, Texas, to purchase 4 Ruffed Lemurs from the South African animal dealer, John Visser. The application sought 10 lemurs, but permission was only granted for the 4 that had already left Madagascar.

ES 54: February 19, 1971. Permission was granted to the Rare Feline Breeding Compound, an animal dealer and breeder in Center Hill, Florida, to purchase 9 Mongoose Lemurs from the Bazizoo. The Bazizoo, in Cros-de-Cagnes, on France's Mediterranean coast, is operated by Georges Basilewsky, who was able to obtain many wild-caught lemurs, some reportedly from sailors landing in Marseille, who were bringing back pet animals. Recent reports indicate that the zoo may become a lemur refuge on Basilewsky's retirement, which may have already occurred. The Compound has been successful with Mongoose Lemurs, recording seven births as of 1974.

ES 85: April 12, 1971. Permission was granted to the Cincinnati Zoo to purchase 8 Mouse Lemurs from John Visser. The zoo is listed as possessing only two specimens in the 1974 International Zoo Yearbook.

ES 105: June 28, 1971. Cincinnati Zoo applied for a pair of Ruffed Lemurs to be supplied by John Visser. Two months before the permit was granted, the Cincinnati Zoo Director, Ed Maruska, wrote Visser suggesting he dispose of the animals in Europe, since their entry into the United States was forbidden. On May 3, 1971, Visser replied that the Malagasy government license was issued on the condition that the animals go to Cincinnati:

Right now, it is impossible for me to offer the animals elsewhere, especially species like Ruffed Lemurs and all the excitement they generate. Not only would I be breaking a condition of capture, but as a member of IUCN for South



Ruffed Lemur

Africa, it could prove highly embarrassing, if, as is sure to happen, some leading zoo (Frankfurt, for example) in Europe gets an investigation going perhaps you could call some influential person like Buettner-Janusch and ask his help You are free to mention that I am an IUCN representative (Felidae Specialist Group), have thus acquired the animals legally, with the cooperation of the Malagasy Scientific Research Department.

Antony Mence, Executive Officer of the IUCN's Survival Service Commission, informed IPPL on January 23, 1975. «Mr. Visser has no official status with IUCN and is certainly not entitled to represent it in any way. He is, however, an 'observer' to the Cat Specialist Group.»

Visser blames the US Department of the Interior for the deaths of two infant Ruffed Lemurs he was holding: during the delay in permit issuance, they were left with «bullying adults» and died. He also notes having on hand one Fat-Tailed Dwarf Lemur, a rare species of which IPPL can locate no captive births outside Madagascar.

Apparently Visser was able to get lemurs through his association with the Institut Pasteur, a scientific institute in Tananarive, Madagascar: it is not clear whether his affiliation with IUCN facilitated this opportunity to trade in lemurs which Visser so diligently used. Although reportedly mainly self-taught, Visser has a good reputation in zoo circles for the quality of the animals he sells, although his activities are a cause of concern to some South African conservationists.

The Ruffed Lemurs imported on this propagation permit have not yet bred and were moved earlier this year to the University of Cincinnati.

ORANG-UTAN PERMITS

The orang-utan continues to be gravely endangered, through loss of habitat and illicit maintenance of baby orangs caught during timber-felling and other jungle operations. Prior to the mid-60s, a large-scale international trade in illegally-obtained baby orangs, caught by the killing of mothers, centered at various times on Hong

Kong, Bangkok, and especially Singapore. Thanks to the activities of the Orang-Utan Recovery Service, in which major roles were played by IUCN, Barbara Harrison, Charles Shuttleworth, and Dr. Grzimek of Frankfurt Zoo, (who promoted an agreement among the world's responsible zoos not to purchase illicit oranges), the trade has been curtailed to a considerable degree. Hence, most of the ES permits for orang-utans were for transfers of animals between zoos. One of these zoo transfer permits, however, raises some questions as to what exactly transpired. IPPL does not yet have a complete explanation.

ES 49: June 22, 1971. This permit allowed the **Busch Gardens** (Tampa Zoo) to purchase one pair of Sumatran oranges from the dealer **Jabria** of Harderwyck, in the Netherlands. Due to the colonial link between Indonesia and the Netherlands, the Netherlands has long been a center of both licit and illicit orang trading which has continued to a lesser extent since Indonesian independence. The male in this case was stated to have been born in **East Berlin Zoo** and the female in **Dresden Zoo**. Surprised at this movement of oranges from East to West, IPPL instituted enquiries. Dr. Dathe, Director of **East Berlin Zoo**, in a letter dated February 6, 1975, did confirm the sale of 18-month old **Vroni** to **Jabria** in 1970. However, **Gotthart Berger**, Director of **Dresden Zoo**, wrote on February 6th: «we have not sold a female orang to the dealer **Jabria** of Harderwyck, Netherlands, in early 1971 or late 1970. In no case, earlier or later, have we sold an orang-utan to this dealer.»

A letter from **Gerald Lentz**, Manager of Zoological Operations, **Tampa Zoo**, does not clear up the mystery. «We currently have two male oranges received on June 3, 1971, from a US animal dealer, and one male received on June 3, 1971, from another US dealer, not **Jabria**.» A further enquiry mailed to Mr. Lentz about these oranges on April 15, awaits a reply. It is not clear whether the animals on the permit ever reached Tampa, and, if so, whether they died or were sold. The confusion is compounded by the fact that no oranges are listed as being in Tampa's possession in the **Census of Rare Animals in Captivity** section of the 1974 **International Zoo Yearbook**.

Permit sought. A remarkable permit application was pending as of November 1974, and had not been acted on as of March 1975. The 1973 revision of the **Endangered Species Act** made it illegal to ship endangered species between US states without a permit. The applicant, **Bobby Berosini**, of **Reed Springs, Missouri**, requested permission to ship 3 oranges interstate as part of his circus act. **Berosini** complains of the act, which, he feels, «has the potential to phase out zoos and circuses.» He asserts, but does not document, that his oranges were born in captivity. Further, he notes that his act has been praised by **Dr. Bourne**, Director of the **Yerkes Primate Center** in Atlanta, Georgia. In **The Ape People** (1971), **Bourne** states:



Orang-Utan

he (**Berosini**) has the gorillas and the chimpanzee doing acrobatics on the trampoline. In the final part of his act, he has an orang-utan dancing the hula on a big drum and the gorillas beating the tom-tom on either side It is a very impressive act.

Berosini notes in his application that: «we are solid citizens, pay taxes, support our community, and also donate a great deal of time to charitable functions.»

In 1973, **Berosini** applied to purchase a new gorilla to replace one which had died of a 'heart attack', (could it have been caused by over-exertion on the tom-tom and trampoline?) In spite of **Berosini's** emphasis on his performances for the «burned, crippled and retarded», and the economic hardship the denial of a permit would cause him, the application was denied.

GORILLA PERMITS

The usual method of capturing gorillas is to kill the mother and to remove the clinging infant from her body. Since gorillas, unlike oranges, live in groups, the other adults are often killed too for fear the «gentle giant» might be sufficiently provoked to attack the human predators. Capture of an infant gorilla often involves the deaths of many mothers and a majority of the infant gorillas which have survived the bullets die of neglect. Many gorillas die within the first year of captivity, (e.g. two infant gorillas shipped to the **Japan Monkey Center** in 1971 were dead within a week.) Hence one would expect the Department of the Interior to weigh the threat to the species more heavily than any real or imagined economic hardship to animal dealers. Two permits, **ES 43** and **ES 97**, are of particular interest.

ES 43: January 11, 1971. The **Rare Feline Breeding Compound** sought to import to the USA nine Lowland Gorillas. The Compound Director, **Robert Baudy**, wrote in his letter of application:

all of these animals were collected and are conditioned for our exclusive use in the Cameroons, the Gabon and the Congo Republics following is a list of the specimens involved showing sex, weight, and country of origin with names and addresses of our hunters and suppliers:

SEX	WEIGHTS	SHIPPERS
4 m.	42, 32, 26, 12 lbs.	Mr. Robert Roy, Sangmelina, Cameroons
3 f.	18, 14, 14 lbs.	Mr. Robert Roy, Sangmelina, Cameroons
1 m.	40 lbs.	Mr. Jean Muxart, Moanda, Gabon
1 f.	30 lbs.	Mr. D. Maniacky, Director, Parc Zoologique, Brazzaville, Congo Rep.

Baudy notes that, «some of the animals are extremely young and will have to be weaned before shipment.» Recent reports indicate that **Roy**, an expatriate Frenchman, is still in operation in the Cameroons and that a new German dealership is setting up legally to trade in gorillas and chimpanzees.

An interesting sidelight is **Baudy's** assertion that he had previously supplied **Dr. Gibbs** of the **National Institutes of Health** with gorillas. **Dr. Gibbs** confirmed to IPPL that he had indeed purchased two gorillas from the Compound as well as one from the **International Animal Exchange**, Ferndale, Michigan, USA. The gorillas are used for the study of genetics, behavior, breeding and latent viruses. Three young have been born: one died of anaemia, one of asphyxiation, and another is alive at three months.

The Department of the Interior only allowed **Baudy** to import one gorilla: even that appears too much since the purpose of the Act was surely to prevent exactly such destructive activities.

ES 97: June 4, 1971. Also an 'economic hardship' permit, this allowed the **International Animal Exchange**, Ferndale, Michigan, to import four female infant gorillas for the **Gladys Porter Zoo**, Brownsville, Texas. Why Interior allowed the IAE to import all the gorillas it was seeking and was less generous to the former applicant, is unclear. The letter of application from the IAE's Vice-President, Tom Hunt, states:

1. The four gorillas will be captured in the Cameroon by Robert Roy.
2. The customary procedure followed in the Cameroon is for export permits to be issued after the capture of the animals.
3. Three of the four were in captivity as of April 5, 1971.

Hunt added that: «the information provided in this letter concerning the supplier is priority matter of a confidential nature. Consequently, we request that it not become a matter of public record available for public inspection.»

Puzzled at this secrecy, IPPL instituted enquiries which Interior does not appear to have done since there is no record of any Interior investigation of the circumstances in the Cameroons. It appears that the Cameroons has an export quota of 15 gorillas per year shared among three dealers.

The application for the permit notes that the purpose of the importation is to complete an open contract between the Exchange and the Zoo. A cheque for the sum of \$ 72,817 from the **E.C. Sams Foundation** which finances the **Gladys Porter Zoo** is attached. The cheque is dated November 14, 1969, three weeks before the passage of the Act. Support for the claim of economic hardship was added by the statement that Don Hunt, the President of the **International Animal Exchange**, had made two separate trips to West Africa from his home in East Africa for the sole purpose of procurement of the four gorillas, at a total cost of over \$ 5,000. No bills or receipts are included with the paperwork, nor any explanation of why this transaction could not have been handled by correspondence. Further, it was stated that the **Gladys Porter Zoo** had already spent \$ 100,000 on the living facilities for the gorillas although confirmatory evidence is not present in the file. In addition, the **International Animal Exchange** added that its corporate counsel had advised that there was a possibility of legal action against IAE by the zoo if the contract fell through and the gorillas were not supplied. Since the unfortunate gorillas had no 'corporate counsel' to plead their case, the permit was issued for the 4 gorillas requested.

When one thinks of «economic hardship», one thinks in terms of some hard-pressed entrepreneur facing bankruptcy when suddenly-passed legislation threatens him with ruin. But it appears that, in Interior's view, the effect of the one transaction took precedence over the total financial picture of the institutions involved. To IPPL, the issuance of **ES 97** appears totally unjustifiable and any claim of economic hardship ludicrous. Let us look for a moment at the partners in these transactions. In a May 23, 1970, article in **Business Week** entitled «Wild Game Pays Off for Bwana Don», we are told that Don Hunt and his three brothers have a \$ 2,000,000 per year business: and that, besides being the world's largest single trappers and suppliers of wild animals, they operate game preserves, and own the Mount Kenya Game Ranch and Hunt's International Travel Organisation. John Connally, former Governor of Texas and Secretary of the Treasury at the time of this permit application, was listed as an investor: however, there is no indication that he was involved in the issuance of this and other permits, although wealthy Texan interests and a business associate were the beneficiaries.

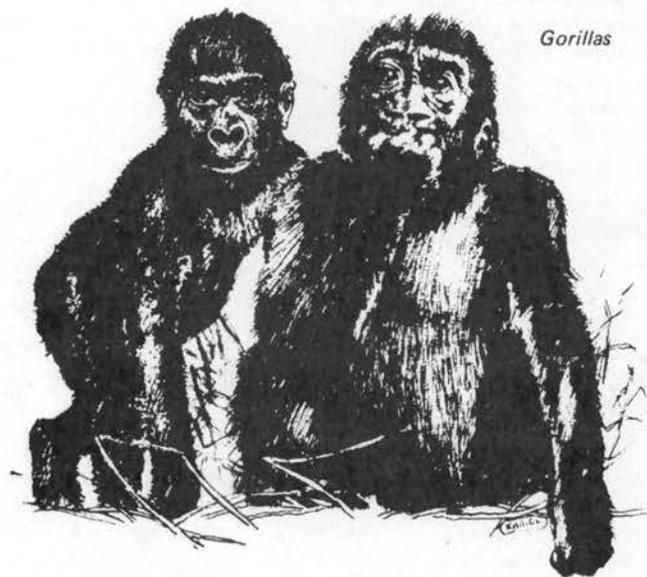
The **Gladys Porter Zoo** is operated by the **E.C. Sams Foundation**. Gladys Porter is the widow of Earl Sams, who was, for 25 years, Chairman of the Board of the J.C. Penney Company, and, according to the Zoo's handouts, «one of the most successful and primary Captains of Commerce of his day.» The Zoo describes itself as a 'haven' for rare animals. A zoo handout says «the Sams Foundation felt that this unique zoo should concentrate on the rare and endangered species of the world in need of help It meant the shouldering of a staggering burden to take on the future of some of the vanishing species of the world great effort has been made to obtain many of the animals seen at the zoo the collection represents an unending chain of triumph and tragedy.»

This permit was undeniably a triumph for the zoo and the dealer involved, but it was also a tragedy for the gorilla mothers shot to death to procure the four infants which, «in need of help», would find sanctuary in Texas from the travails of jungle existence. Although the permit was for 4 females, the 1974 **International Zoo Yearbook** lists the **Gladys Porter Zoo** as owning one female. Currently, hundreds of institutions find themselves with a vocation to conserve endangered animals and the way to conserve them usually includes the institution getting hold of specimens for itself: often, of course, this involves withdrawing animals from the wild for the purpose of 'saving' them, thus placing a further drain on the species. In general, institutions sincerely interested in preserving endangered wildlife would be better advised to support programs aimed at conserving natural habitats and their wildlife.

In reply to an enquiry about why this permit was issued, Mr. Clark Bavin, Chief of Enforcement at the Department of the Interior, wrote to IPPL on March 20, 1975:

The criteria for issuance of economic hardship permits are (a) the effect such permit would have on the wild population (b) the severity of the economic hardship (c) evidence that the applicant entered into a valid contract prior to the date the wildlife was listed (d) whether the applicant can effect the importation within one year from the date the wildlife was listed and (e) the economic, legal and other alternatives open to the applicant. It was determined that the **Gladys Porter Zoo** qualified under these criteria.

Mr. Bavin's implication that the capture of four FEMALE infant gorillas, the hope for the species' future, does NOT have a negative effect on wild populations (and presumably the deaths of their mothers doesn't either) is as ridiculous as his reference to the «severity» of the economic hardship which would have resulted to the zoo or the dealer as a result of the denial of the permit.



PILEATED GIBBON PERMIT

The Pileated Gibbon is listed in the IUCN's Red Data Book on a red page, indicating that the species is in immediate danger of extinction. It occurs only in eastern Thailand and Cambodia, and is captured by the mother-kill method with a high loss of both mothers and infants.

ES 122: August 16, 1971. This permit allowed the **Gladys Porter Zoo** to purchase a pair of Pileated Gibbons from the **Friendship Farm**, Bangkok, via the **International Animal Exchange**. The Pileated Gibbons were purchased under the aforementioned «open contract» between the zoo and the Exchange. IAE's «Statement of Economic Hardship» notes, «IAE spent considerable man hours and communication cost locating a source of supply.» One can

*Pileated Gibbon
and Infant*



well believe this since the commercial export quota for gibbons has been zero since 1965 in Thailand. Hunt notes that the zoo had already built the gibbons' cage, «under the strength of the contract», (although no receipts are on file), and that the company's corporate counsel had warned of a lawsuit if the transaction fell through.

Not surprisingly, Interior capitulated to IAE's arguments and the permit was issued. Clause 7 of the permit noted however: «this permit is conditioned upon compliance with all applicable foreign, state and US laws and regulations.» Pong Leng-ee, Chief of Wildlife Conservation in Thailand, asserts that these gibbons did not have export permits to leave Thailand. The file in the **Office of Endangered Species** contains no record of any Thai export permit, which is surprising as one would think that the first step in processing any permit application would be to make sure that the source country wished to supply the animals. If the animals had no Thai export permits, the shipment would have been in violation of both Thai and US Law, a possibility which IPPL is investigating.

A Field Officer from the **International Society for the Protection of Animals** visited the **Friendship Farm** in 1974 and reported, «[procurement of] protected species was no problem: matters could be arranged.»

DOUC LANGUR PERMITS

The Douc Langur is a delicate, leaf-eating monkey which lives in the war-ravaged areas of Indochina. Its Red Page status in the Red Data Book indicates that it is a conservation «basket case». A Thai animal dealer informed IPPL that very few specimens survive the first month in captivity. Yet, incredibly, Interior issued a series of permits for Douc Langurs from Thailand – where they do not occur. The animals in question must have been brought into Thailand from Vietnam or Laos, and, unless export permits are produced from the TRUE country of origin, Interior, in issuing permits for Thai Doucs, would find itself in the strange position of issuing permits to smuggle. And permits in violation of the terms of the permit itself, which states clearly that the animals must be legally acquired!

ES 45: January 13, 1971. Permission was granted to the **International Animal Exchange** to purchase 3 Doucs from the **Friendship Farm**, Bangkok, Thailand. One of the animals was already dead when the shipment reached the London Airport Hostel run by the **Royal Society for the Prevention of Cruelty to Animals** (see IPPL Newsletter III). The file contains no mention of export certificates from any country. The fate of the animals is unclear as two were destined for the **St. Louis Zoo** and one to the **San Antonio Zoo**, neither of which lists any Doucs in the **International Zoo Yearbook's** census of rare animals in captivity.

ES 121: August 16, 1971. Permission was granted to the **International Animal Exchange** to import 2 Doucs, both from Bangkok and destined for the **Gladys Porter Zoo**. These Doucs were to join three previously purchased from IAE in October 1970. A permit was not required for the former transaction since no mammals from other countries than the USA were listed as endangered until a year after the passage of the Act, thus making it inoperative for an entire year. Conservationists are still suffering endless frustrations trying to get chimpanzees and other species added to the List.

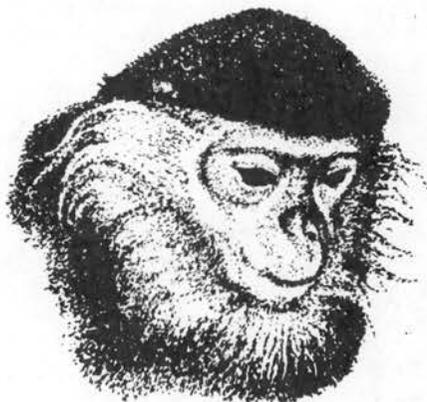
Consultants on this permit were not enthusiastic: one notes of the Zoo Director, «he's already killed the last 4 he brought in»; another notes, «there are no indications in the application that the organisations concerned are either aware of or concerned with the status of the species requested», and asks the true origin of the animals, since they are not indigenous to Thailand.

ES 417: May 17, 1973. In spite of the warning about the Douc's not being a Thai animal in connection with ES 121, yet another permit, signed by Clark Bavin, the Chief of Enforcement at Interior, was issued to the **International Animal Exchange** and the **Gladys Porter Zoo**. In his application, Warren Thomas, the Zoo Director, notes that 3 of his Doucs have already died, leaving two females. Therefore a «propagation permit» was required to balance the numbers: two males and two females were requested. Thomas states: «we would obtain the animals through legitimate sources which presently operate within the range of the animal we had planned to establish three and then enlarge the numbers the following year unfortunately, before we realised it, the Douc Langur was placed on the Endangered Species List.» Unfortunately for the Douc or the zoo?

The permit was issued for 4 Doucs: signed personally by Clark Bavin, it authorised the zoo to import 2 males and 2 females from «the Southwest [sic] Asian countries of Laos, Thailand or Vietnam.» The file contains no copies of export permits nor even a mention of them. The 1974 **Zoo Yearbook** lists the zoo as being in possession of one male and two female Doucs (out of nine presumably imported). It is questionable whether 'propagation' permits for this species based on withdrawals from the wild do any good: for the Douc and most other species, it would be better for zoos to pool resources, as is the trend in conservation-minded zoos.

Clearly, there are faults in the procedures surrounding consideration of these permits – consultants are rarely used, and, when used, mainly ignored. There is insufficient investigation into the legality of the acquisitions and no sign of consultation with overseas conservation authorities, although some contacts may not be recorded. Some sort of followup is necessary to see to what extent the permits have helped or harmed the species for which they were issued.

Douc Langur



It is doubtful whether it is necessary to issue any economic hardship permits at all under laws governing endangered species. Frequently, word gets out about the imminent listing of an animal and contracts could well be made in anticipation. The status of animal species does not remain static. Extermination or extinction is something that may today, with most populations seriously reduced, occur very quickly. The loss of a few dollars to an animal dealer will seem trivial viewed in the light of history: the loss of a species will not. The fact that animal dealers have been allowed to rape the wild for decades does not give them a divine right to continue their depredations indefinitely. Rather, they should appreciate the tolerance accorded to their activities so far both by the countries out of which they traffic and, in general, by law enforcement authorities in most importing countries.

GIBBONGATE REPORT

Events continue to unfold in the extraordinary drama of the gibbons shipped from Thailand to the University of California at Davis. (See IPPL Newsletters 2, 3 and 4). These shipments have assumed particular importance in view of the US National Academy of Sciences' recent proposal that funding be cut off from researchers purchasing illegally exported primates. (NAS Report, *Nonhuman Primates*, 1975).

THREE SHIPMENTS

Prior to presenting further developments, we shall review the shipments in question for new readers.

1) **December 31, 1973**; ten unweaned infant gibbons were sent by the Thai dealer Pimjai via the Ark Animal Exchange in Canada to the University of California at Davis' **Comparative Oncology Laboratory**: six of these baby gibbons died of pneumonia.

2) **January 16, 1974**; nine former pet gibbons were shipped by Pimjai to the Ark Animal Exchange: six were shipped to the Davis laboratory.

3) **August 9, 1973**; eleven gibbons were shipped to Davis by the US Army - Walter Reed Hospital Gibbon Laboratory in Bangkok.

At least one shipment went to Davis via Singapore, which has no indigenous gibbons.

THAILAND EXPORT REGULATIONS

Under Thai law, protected wildlife is divided into two Categories, namely, I and II. Gibbons are on Category I and, for them to leave Thailand legally, the following documents must be secured:

- 1) a health certificate issued by the Department of Livestock Development,
- 2) Thai Customs clearance papers,
- 3) an export permit issued by the Royal Forestry Department, and
- 4) an export license issued by the Department of Foreign Trade.

IPPL REQUESTS INVESTIGATION

Because some of these formalities appear not to have been completed in the abovementioned shipments, IPPL forwarded all relevant documents and evidence it had collected to the US Department of the Interior's Division of Law Enforcement. Interior was requested to investigate whether the shipments violated the clause of the US Lacey Act which forbids the import of wildlife in violation of the laws of ANY country.

The «economic hardship» loophole was somewhat tightened in the 1973 revision of the Act: a proposal that there should be public hearings on all permit applications was rejected but it was decided that all permit applications must be published in the Federal Register, and comments from interested parties and organisations be taken into consideration. The Secretary of the Interior must now publish in the Federal Register his findings that a) the exemptions were applied for in good faith and b) the issuance of the permit will not harm the species. The need now is to add more primate species to the List. When this occurs, the Act will come closer to its purpose of committing the United States to leadership in preserving the world's wildlife from extinction.

IPPL'S INVESTIGATION

IPPL contacted all the relevant Thai authorities, who were uniformly helpful and spent much time investigating the circumstances. The following information was gathered.

THAI DEPARTMENT OF LIVESTOCK DEVELOPMENT

Health certificates for animals exported from Thailand are on file at the Department of Livestock Development in Bangkok. Dr. Chamlong Bhuchongmutta, Chief of Disease Control, kindly supplied IPPL with a health certificate issued to Pimjai for a shipment of 80 mynah birds destined for the Ark Animal Exchange. The certificate was dated December 31, 1973. The carbon-copy of this health certificate is on file in the USA and IPPL secured a copy. The certificate is identical, except that 10 Heads of White-handed Gibbons were added to the 80 mynah birds. It is not yet known who made the alteration.

Dr. Chamlong was unable to find any health certificate issued to Pimjai for a shipment to the Ark Animal Exchange on January 16, 1974. On file in the USA, however, is a «health certificate» supposedly issued to Pimjai for the shipment of 1 Leopard Cat and 9 gibbons to the Ark Animal Exchange. Dr. Chamlong denounces this 'certificate' as a total forgery. It is misspelled and in the wrong format, he alleges, pointing to the heading which reads «Ministry of Livestock Development».

It is surprising that such an obvious forgery did not draw the attention of authorities anywhere along the animals' itinerary.

THAI CUSTOMS

Thai Customs has a customs clearance application by Pimjai for the export of 80 mynah birds on December 31, 1973. There is no record at all of any gibbons. Regarding the mynah birds, Mr. A. Lewis of the Canadian Ministry of Agriculture, wrote to a correspondent on June 23, 1975: «our records show that the birds were not imported on December 31, 1973, and no import permits had been issued for these birds.» However, Lewis admitted that his Department had issued Canadian import permits to the Ark Animal Exchange for a shipment of 10 gibbons.

There is no record at Thai Customs of the departure of any leopard cat or gibbons on January 16, 1974. Mr. Lewis admits that the Canadian Ministry of Agriculture issued an import permit to the Ark Animal Exchange for nine gibbons. He adds: «we have no knowledge of a leopard cat being shipped with the gibbons to Dorval Airport on January 16, 1974.» The Thai Customs Investigation Division is currently investigating the case.

THAI FOREIGN TRADE DEPARTMENT

The Department of Foreign Trade kindly provided IPPL with a list of gibbon export licenses issued between June 1973 and June 1974. These include no licenses to any animal dealer. In addition, Khun Suthae Natvarat, Director-General of Foreign Trade, wrote to a Canadian reporter on March 30, 1975: «regarding the two shipments of gibbons in question, we have no evidence of our issue of export permits to Pimjai Birds and Wild Animals.» The Department has formally notified the Chief of Wildlife Conservation, Mr. Pong Leng-ee, that it authorised neither the December 31, 1973, nor the January 16, 1974 shipment of gibbons.

IPPL learned that the US Army-Walter Reed shipment of 11 gibbons had a Foreign Trade export permit and also learned how it was secured. The US Army Gibbon Laboratory in Bangkok is part of a larger Army medical program which was until recently under the direction of Colonel Philip Winter. On February 27, 1973, Colonel Winter sent a memorandum to Admiral Samrit Jatinanda, a Thai associate of the Army research program. Winter noted that the National Cancer Institute of the United States had contacted the US Embassy in Bangkok asking its assistance in securing export papers, and concluded: «therefore, request your assistance in obtaining permission for the shipment of a total of 11 gibbons from our animal colony to the National Cancer Institute.»

Admiral Jatinanda replied on March 28 that permission had been secured to export the gibbons and that Winter should have someone contact the Department of Foreign Trade for an export license. The Forestry Department was not mentioned. The animals were not presented for the routine forestry clearance at the airport, and the Army issued its own health certificate. Forestry officials only learned of this shipment a year after it happened.

At the time of this shipment, Thailand was still under military rule, and American influence was great. Ambassador Leonard Unger has admitted to IPPL that he personally intervened to facilitate the Foreign Trade Department export papers.

It is unfortunate that the dual responsibility for issuance of export documents served in this case to cover up a shipment of questionable legality.

AMERICAN EMBASSY ENQUIRY

Six months after IPPL handed over its file of documents to Interior, Mr. William Toomey, Counselor for Economic Affairs at the US Embassy in Bangkok, wrote to Mr. Pong Leng-ee, Chief of Wildlife Conservation in Thailand. Toomey's January 16, 1975, letter requested a copy of Thai wildlife legislation and enquired whether the shipments via the Ark Animal Exchange had export permits. The Army gibbons were not mentioned.

MR. PONG'S REPLY

Mr. Pong's reply to the Embassy letter asserted: «no permits have been issued for the export of gibbon to the Ark Animal Exchange, Canada, or the University of California at Davis, or to any Thai dealer to supply them.» He enclosed a copy of the relevant Forestry law, and ended: «if we can be of any assistance to you, please do not hesitate to contact me.»

Mr. Pong's letter was not notarised, as requested, but passed through Department protocol, being approved by several officials. As there is no such practise as notarisation in Thailand, and the Embassy did not explain what it meant, this seemed the correct response, according to Mr. Pong. The Embassy never followed up on Pong's offer of further assistance.

INTERIOR DROPS CASE

On March 20, 1975, IPPL received a letter from Mr. Clark Bavin, Chief of the Division of Law Enforcement at the US Department of the Interior. Bavin stated that the gibbon case had been dropped due to Mr. Pong's failure to cooperate. In another, later, letter to a New Hampshire animal-lover, Mr. Bavin was more specific; he wrote:

it appears that you have been misinformed about the facts in the case. In your letter, you refer to correspondence between this service and Mr. Pong Leng-ee, National Wildlife Management, Thailand. In response to an official enquiry submitted by this service to the US Embassy in Thailand, Mr. Pong did provide a letter stating that no export permits had been issued authorising the export of gibbons to the US. The Embassy provided this service with the information contained in this letter and advised that this letter was being forwarded to Washington. This office, however, never received the letter. This actually made little difference in the investigation, because, according to information received from the US Embassy, Mr. Pong refused to certify the contents of his letter. Without such certification, and subsequent exemplification by the US Embassy, the information would not be legally admissible in US courts. Also information obtained from other sources conflicted with Mr. Pong's, making it impossible for the Embassy to determine the facts in the case.

THE DAVIS AGGIE REPORT

An alternative version of the dropping of the gibbon case was offered by David Purinton, of the US Department of the Interior's Sacramento Office. Purinton was named in the April 16, 1975 issue of the *Aggie*, the campus newspaper at the University of California at Davis, one of whose component institutions, the Comparative Oncology Laboratory, had purchased the gibbons, as having taken charge of Interior's entire investigation of the gibbon case; he was reported as saying that all IPPL's charges were unfounded and that the gibbons were «legally imported through channels and the permits had been obtained in both countries.» Purinton is also reported as saying: «the only problem discovered was one of communication between two government agencies in Thailand - one did not know that the other had issued the required permits.» All that Interior found were «minor technical discrepancies», but nothing illegal. One wonders what Purinton defines as «minor technical discrepancies.» The Davis *Aggie* refused to print IPPL's rebuttal of Purinton's statements. Probably the reason for this violation of principles of fairness and ethical journalism lies in a statement in the *Aggie* article that: «any truth to the charges might have resulted in a loss of federal funds to the Vet-Med's Comparative Oncology Laboratory.»

US EMBASSY IN BANGKOK COMMENTS

The US Embassy admits that neither the Department of Foreign Trade, nor the Thai Customs, nor the Department of Livestock Development were contacted. No Interior investigator came to Bangkok, and the «investigation» was left in the hands of the Economic Counselor at the US Embassy. Embassy officials admit that the notarisation process was not explained to Mr. Pong and that no explanation or assistance in performing the process was offered. However, it appears that the question of notarisation may be a smokescreen for dropping the case. A top lawyer in the US Justice Department has informed IPPL: «I am at a loss to comprehend why the Department of the Interior would require a formal (i.e., legally admissible) statement from Director Pong at this juncture, when no judicial proceedings have been instituted and when the matter is merely in the investigatory stage.»

PONG LENG - EE'S COMMENTS

Mr. Pong Leng-ee received a copy of a letter alleging his non-cooperation from a recipient who was not satisfied with Interior's response to his enquiry. He also saw a copy of the **Aggie** article. He was distressed at being scapegoated in spite of his cooperation, and therefore sent a letter to Clark Bavin at Interior. Pong drew Bavin's attention to letters and statements critical of himself that Interior had issued; he pointed out that Interior's allegation that he had refused to certify the contents of his letter was false, and that, in fact, he had offered full cooperation. Pong took note of Bavin's statement that information collected from other sources conflicted with his, and asked Interior to identify the sources, since all Thai authorities agreed that the gibbons had no export permits and that the health certificates were falsified. In response to Agent Purinton's statement in the **Davis Aggie** that Interior had made an «extensive investigation» of the case, Mr. Pong pointed out that the entire investigation in Thailand appeared to be a letter addressed to him from the US Embassy in Bangkok. Reacting to Purinton's statement that the gibbons had export permits, Mr. Pong challenged him to produce them. Mr. Pong concluded his letter: «I most strongly protest the Department of the Interior's inaction in the case and its blaming its failure to act on my alleged non-cooperation. I strongly protest the issuance of false and misleading statements which reflect on my reputation and integrity. Since only a few such statements come to my attention, it is impossible for me to refute each letter and statement individually.»

PROSECUTION PROBLEMS

Prosecution in cases of wildlife smuggling has been rare in Thailand, due to a combination of factors, including the divided authority over wildlife export, the failure of importing countries to report violations back to Thailand, and the fact that the import of illegally-exported animals is not considered an offence in many countries, including Canada: hence, once the animals actually depart from their homeland, there is rarely any feedback on what becomes of them.

CANADA'S NON - COOPERATION

Perhaps the most discouraging aspect of the gibbon case has been the total non-cooperation of Canadian authorities, and their dedicated, persistent defence of the Ark Animal Exchange's (and by implication, other dealers') right to traffic. Both the Ministers of Agriculture and Environment refuse to take any action, and, worse still, they refuse to hand over documents for use of Thai authorities, although, without the Canadian import permits, prosecution efforts in Thailand may flounder.

Dr. Morton Shulman, a Canadian M.P., has tried to get action

IPPL NETWORK EXPANDS

Anna Merz will represent IPPL in Ghana. Mrs. Merz is very active in wildlife conservation activities and is also trying to improve shipment conditions for exported wildlife. Currently she is rearing a young chimpanzee confiscated by government authorities from a hunter. On arrival, the chimpanzee was in poor condition and weighed only 4 pounds. Mrs. Merz reports that it is doing well now and will eventually join the group of confiscated chimpanzees which Ms. Penny Rucks is trying to rehabilitate in Bia National Park.

Sonia Jeffrey will represent IPPL in Liberia. Ms. Jeffrey is a biologist who worked for 6 years in the high forest region of Ghana. Currently, she is studying the animal trade in Liberia on a grant from the Fauna Preservation Society's 100% Fund.

Detlef and Walai Blumel will represent IPPL in the Cameroun. Ms. Walai used to serve as IPPL's representative in Thailand.

in Canada; writing in the **Toronto Sun** (July 22, 1975) he states: «to me, the most disgraceful aspect of this entire cruel transaction has been the attitude of the Canadian government . . . officialdom in our country apparently do not give a damn about endangered species.» He notes «indifference, evasions and outright lies.»

IPPL COMMENTS

IPPL deplures both the dropping of the gibbon case and the method used to drop it. It appears most likely that the true reason for the dropping of the case lies somewhere in the US Department of the Interior's relations with other agencies of the US government and vested research interests. It is easier to drop an investigation by alleging «foreign» non-cooperation than to enter into difficult infights. It is not clear that the United States Department of the Interior is fully committed ideologically to the concept of the United States protecting the wildlife of other nations, especially if it involves denying certain laboratories and zoos animals they want. In the case of the gibbons, the US had a clear opportunity to respect the laws of Thailand and enforce its own law. Interior claims to be understaffed; however, in the gibbon case, IPPL staff and friends conducted most of the investigation at their own time and expense, and without the power to subpoena evidence. Innumerable man- and woman- hours were spent on the case by interested investigators. The US Department of the Interior did very little in contrast and found a way to put the case to rest. It is a tragedy that those employed to protect the world's dwindling wildlife do not use their power when given an opportunity. It is hard to know how any US agency would become involved in a coverup or whitewash of one of the vilest trades on earth - the traffic in infant primates taken from the bodies of their dead mothers.

However, consumer advocates like Ralph Nader have observed for years that regulatory and investigative agencies in the USA tend to become tools of the institutions they are supposed to regulate. Interior's Division of Law Enforcement appears to be no exception.

STOP PRESS: after receiving Pong Leng-ee's protest, the Department of the Interior reopened the gibbon case on the basis of "indications that new evidence may be available."

IPPL has received a report of 2 further shipments of gibbons sent by Pimjai to the Ark Animal Exchange. On March 20, 1974, five gibbons were shipped; one was dead on arrival. On March 28, 1975, 1974, ten gibbons were shipped - all ten were dead on arrival. It is not clear whether these animals were destined for the University of California at Davis.

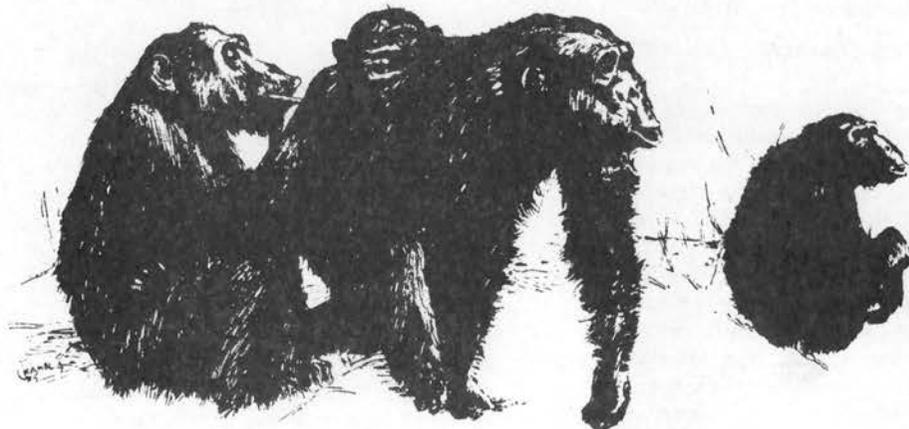
Mr. James Gormley, of the US Embassy in Bangkok, delivered an apology to Mr. Pong Leng-ee from the U.S. Department of the Interior on September 18, 1975.

Dr. William McGrew will serve as IPPL representative in Scotland. Dr. McGrew teaches Psychology at the University of Stirling. He has studied the behavior of both wild-living and captive chimpanzees.

Dr. Carolyn Tutin will serve as IPPL's Secretary for Scotland.

Dr. S.M. Mohnot, Professor of Zoology at the University of Jodhpur, will strengthen IPPL's India network. Dr. Mohnot has been studying the life of the Indian langur on the fringe of the Great Indian Desert.

CORRECTION: Dr. Duane Rumbaugh, Professor of Psychology at Georgia State University, USA, was incorrectly announced as a member of IPPL's Advisory Committee in Newsletter III. Although Dr. Rumbaugh offers us advice on a friendly basis, he is not a Board member.



CHIMPANZEE COLLECTING IN LIBERIA

Upon receiving a report from Africa that the New York Blood Center was involved in collecting chimpanzees in Liberia for use in hepatitis research, and that serious loss of chimpanzee life had already occurred, IPPL started an investigation. A preliminary report follows.

IPPL learned that the Blood Center had teamed up with a veteran animal dealer, Harry Gillmore, and set up a center called Vilab II at Robertsfield and a hunting camp near the Ivory Coast border. Several Blood Center employees are involved in the project: the research is under the control of Dr. Alfred Prince, who commutes between New York and Liberia; Dr. Joseph Davis is based at Robertsfield, and Ms. Betsy Brotman and the animal dealer direct the hunting, having trained a team of local hunters. At first, capture was attempted by darting the chimpanzees with a tranquilliser gun, rather than obtaining them by the traditional method which involves killing the mother chimpanzee. The darting method reportedly did not work out well, with chimpanzees dying of heart failure and falls from trees. The Center then started to buy infant chimpanzees from local hunters who had presumably captured them by traditional methods. An IPPL contact in the area reported «an escalation of chimp shooting in the Tchien area with many hunters who formerly hunted for meat, now looking for chimps and selecting when possible females carrying infants.» Apparently word that the Center wanted chimpanzees spread like wildfire through the bush as our Liberian contact reported having met a hunter in Lofa County who was transporting an infant chimpanzee to Robertsfield, 300 miles away. In addition, rare Pygmy Hippos were reportedly captured at the bush-camp, presumably for export.

Mr. Gillmore is alleged to have exported 7 chimpanzees in March 1975 to a major laboratory in New York. These animals had immunity to hepatitis and were therefore rejected from the research program in Liberia. Liberian Forestry officials have been unable to locate records of export permits for these animals although Mr. Gillmore claims he did have permits.

Mr. William Hoff, Acting Minister of Health in Liberia, informed the Blood Center on June 6, 1975, that it was to close down its Vilab II operation. A later letter from Mr. Hoff (July 7, 1975) stated that the Ministry of Health was prepared to reconsider its decision: «if certain measures could be instituted to prevent further occurrence of events in the case.» A new agreement was worked out, and the Center was informed that: «any infraction or

deviation from the agreement will leave us no alternative but a final termination of your activities here in Liberia.»

The agreement stresses the necessity of the Blood Center obtaining its chimpanzees legally, and of ensuring that chimpanzees are not killed or exported. The Center is permitted to capture an unlimited number of young chimps up to 40 lbs. for research and 40 adults for breeding. Strict guidelines are set up for capture, and a few examples of the rules will indicate the difficulties inherent in darting procedures, which require great expertise and knowledge of animals. The hunters are to locate the chimpanzees' nesting sites, and sit there quietly without moving, eating or smoking, until the chimpanzees wake up. Then they are to follow them to their feeding place, where they dart the animals. When the chimpanzees are darted, it takes 3-6 minutes for them to lose coordination. During this time, «every effort is made to keep the darted chimps from climbing trees by making noise to confuse or frighten them. In this manner, the chimp tends to select a ground escape route.» The captured chimpanzees are to be taken to the base camp, where they must stay for no less than two and no more than seven days prior to transfer to Robertsfield.

Chimpanzees not suitable for the vaccine program are to be returned to the capture area and released. Further, «the Blood Center is prohibited from engaging in the sale, barter or exportation of chimps and other animals while operating in Liberia.»

Dr. Aaron Kellner, Director of the New York Blood Center, informed IPPL on June 16, 1975, that, as of that date, eleven chimpanzees had been captured by darting and one in a trap. Fourteen animals had been lost and 21 purchased from local hunters. Dr. Kellner comments: «although these losses are higher than we would like, we are confident that with more experience they will be substantially reduced. They are in any case far less than those involved in the usual chain of commercial trappers and dealers involved in chimpanzee export from West Africa.»

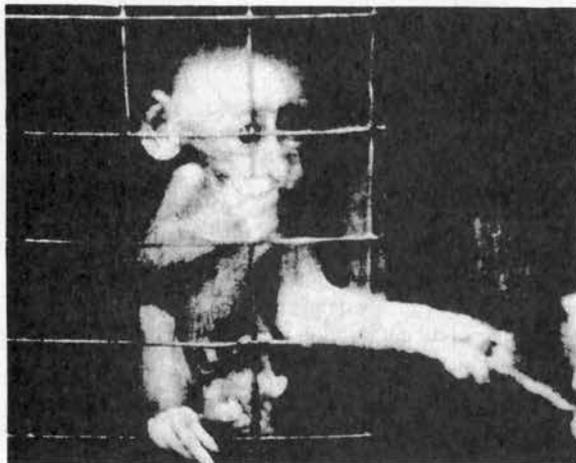
The recent National Academy of Sciences report *Nonhuman Primates* notes that the number of chimpanzees in Liberia is declining and foresees extermination of the entire population within a few years. While in agreement with the principle that better ways of capturing primates than mother-killing must be devised, IPPL feels that the conservation situation for chimpanzees in Liberia and the rest of West Africa is sufficiently critical that none should be removed from the wild by any method or for any reason.

CORRESPONDENCE

Ms. McGreal leaves Bangkok in October, so no further correspondence should be addressed to Bangkok. Membership mail should be addressed to PO Box 9086, Berkeley, Ca. 94709,

USA, and other mail, as well as letters for forwarding to Ms. McGreal, should be sent to Ardith Eudey, Dept. of Anthropology, University of California, Davis, Ca. 95616, USA.

PROJECT BANGKOK AIRPORT



For the ten-week period, March 31 - June 6, 1975, teams of Thai university students monitored wildlife exports from Don Muang Airport, Bangkok. The students worked from 8-5 daily, and undertook a 24-hour watch for two weeks.

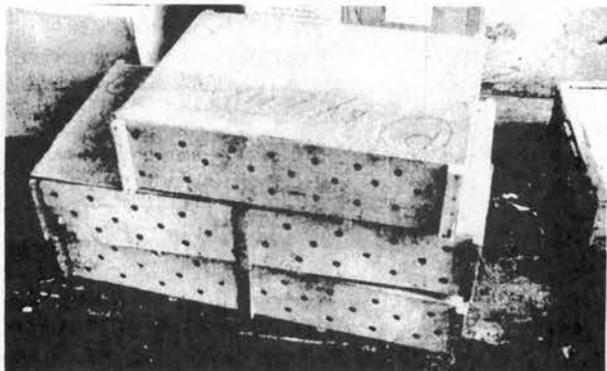
The volume of wildlife traffic leaving Thailand is truly staggering; close to 100,000 mammals, birds, and reptiles left during the course of the project.

Thailand's export quota for monkeys is 6000 per year, but the monkey trade has been slow this year due to early rains and a decrease in primate populations outside of sanctuary areas resulting from over-trapping and irresponsible mother-kill capture methods.

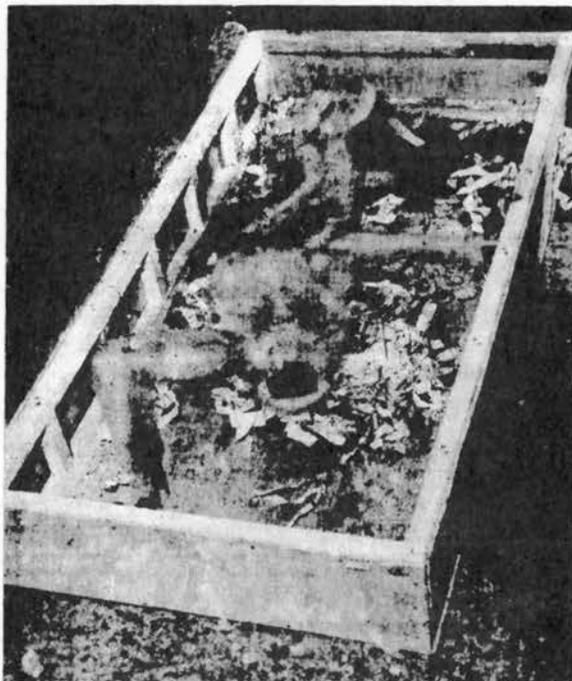
However, several monkey shipments left, nearly all to the USA. Some of them contained infant monkeys. Last year, in conversation with Michael Nolan of Primate Imports, a company which imports around 28,000 laboratory primates a year to the USA, Ms. McGreal raised the subject of this vicious trade. Mr. Nolan agreed that it was deplorable, and said that he did not trade in baby monkeys. It was therefore surprising to observe on June 5, 25 monkeys leaving for Primate Imports in two crowded crates; 5 were juveniles, 12 very small and 8 tiny infants. IPPL contacted Nolan for an explanation and received the following reply:

in regard to baby monkeys, we specifically don't want, nor can we use anything under 1 1/2 kg., our shipper, however, does from time to time send us some of these babies, despite our vehement objections. We have to keep them here for over a year before we can release them for sale.

Students were angered by their daily observations of «snake-boxes» with tiny air-holes about 1/2 to 1 cm. in diameter. It was impossible to ascertain what was really inside. There are several documented cases of smuggling of primates and other wildlife in such boxes. The cramped conditions, lack of ventilation and inadequate care cause heavy mortality to the rare animals shipped



Snake-Box. What is
Really inside?



this way. During the project, no «snake-boxes» were seen to be opened by airline, health, or customs officials; presumably all were reluctant to confront a snake!

It is imperative that boxes containing wildlife have a wire mesh or plastic see-through window at least 3 cm. in diameter, both so that the well-being of the animals can receive proper attention and to prevent smuggling. By accepting closed-up snake-boxes, the airlines, which loudly proclaim their innocence whenever accused of abetting smuggling, are ensuring the continuation of this sordid but profitable traffic.

The International Air Transport Association standards for animal shipment, supposedly mandatory since February 1, 1975, were totally ignored in Bangkok by most shippers and airlines. Although almost all cages were substandard, the students did not see a single box rejected, nor a single airline official checking the boxes with the IATA Standards manual in hand. It is not surprising that many animal shipments get shipped to the wrong destination, as hardly a box complied with the requirement that the consignee's name was to be clearly shown on the crate. Airline officials informed the students that their lines would lose their share of the lucrative wildlife traffic if they enforced the standards since other airlines were not observing them. In addition to the deplorable physical conditions of the crates, they were often brutally tossed around by the handlers with little regard for the comfort of the animals. Water-pots were rarely filled and the feeding instructions for transit animals were ignored. Overcrowding was common, as this reduces shipping costs.

Clearly, if the standards are to have any meaning, IATA must penalise airlines which flout them.

IPPL strongly recommends that similar projects be organised at all airports with a large volume of wildlife traffic.

Commendations are due to Project Airport's fine team leaders, Mr. Suchart Khulkhosa and Mr. Chanchai Rairat of Mahidol University, and Mr. Nilratana Phatanaseree and Mr. Viroj Pruesanusak of Chulalongkorn University, as well as the team members who came from Chulalongkorn, Mahidol and Kasetsart Universities.

Project Bangkok Airport was sponsored by the International Society for the Protection of Animals, the Fauna Preservation Society, the New York Zoological Society, Ms. Christine Stevens of the Animal Welfare Institute and Ms. Katherine Buri, a dynamic Thai conservationist.

READERS' COMMENTS

Ken Sims, Penang, Malaysia

Culling is arguably a technique for reducing e.g. elephant populations in a park which can only support a given number of animals, but it cannot be used for forest primates. Your opposition to culling is supported. Further, wherever a forest is 'reserved' so automatically should its fauna be 'reserved'. Mention was omitted of the vast areas of forest being felled and planted. Should the primates which lose their homes be "harvested" legally to reduce the pressure on other populations? Better not as doing so would provide an outlet for poached animals.

Only an insignificant proportion of users will voluntarily use captive-bred animals unless there is a cost advantage. Thus governments should compel users to use captive-bred animals by denying them wild-caught stock. It would be of interest to see what proportion of "work" could suddenly be done on rodents where before "only primates" were usable.

Dr. Warren Brockelman, Mahidol University, Bangkok

Although the work from Harlow's laboratory may well be declining in scientific imagination and value, the administrative decisions regarding its merit should be made by (a) the funding agencies and (b) a responsible regulatory agency or breeding facility whose job it is to ration primates for laboratory research. The latter do not exist. We should propose that they be established.

Anthropology Professor, USA

The reports on the trauma studies were unbelievable and you are doing a great service in reporting them.

Anthropology Professor, Georgia, USA

This is just a quick note to congratulate you on the April IPPL Newsletter . . . in particular, I was delighted with your "Outstanding Research Award" . . . I also appreciate the literature

search for primates used (up) in trauma studies . . . it's very useful to have such stellar examples of solid research at hand for reference.

Staff Member, British High Commission, Kuala Lumpur, Malaysia

I have heard that a good many primates are being smuggled out of Thailand through a dealer in Langkawi [islands close to coast of Thailand and Malaysia, some belonging to each country]. I am not sure whether these are shipped to Singapore by sea or landed on the coast of Malaysia to continue their journey by road.

Lastly, IPPL was delighted to receive some comments on the politics of conservation from **Señor Felipe Benavides**, the Peruvian conservationist who recently received the first Getty Prize for his efforts to save the vicuña and other wild animals of Peru, and who tells us that the expatriate animal dealers, the Tsalickis, have finally been put out of action in the Amazon headwaters area:

For years I have been insisting on breeding monkeys in Peru for scientific reasons but while we had the Tsalickis in Leticia [Colombia] and Iquitos [Peru], it was impossible to control the situation so now at last we have stopped totally the export of wildlife from the Amazon and the result is that traders like Tsalickis who also are now controlled from Leticia are looking for Bolivia and Ecuador.

I am so much aware of this problem that I feel again the importance of a coordinating body within the Organisation of American states. It is a Latin American problem that must be solved by Latin Americans. The more evidence I see of contraband and illegal trade among our nations in Latin America, the more I feel that OAS must intervene. One of the reasons for this intervention is that legislation in one country sometimes does not fit with the legislation of a neighbor.

THIS MONTH'S AWARD

The work chosen for this month's award is truly incredible. The United States Army Gibbon Laboratory in Bangkok (known as SEATO Lab) killed **four three-year old female** gibbons, rare animals on Appendix I of the Convention on Trade in Endangered Species, in a **dog heartworm** experiment. Since young females are the hope of any species' future, it is truly astounding that four young females were so wastefully destroyed.

The experiment is described in the article "Experimental Infection of the Gibbon with *Dirofilaria immitis*", in the **American Journal of Tropical Medicine and Hygiene**: (Vol. 21, no. 5, 1972). The researchers include Dennis O. Johnsen, Alexander de Paoli, and Prayot Tanticharoenyos.

Heartworm is transmitted among dogs by the *Aedes* mosquito, but the Army transmitted it to the gibbons by subcutaneous inoculation. The four young gibbons were killed at various intervals. The conclusion of the Army's report is that, "it would appear that the response of the gibbon to *dirofilaria immitis* is similar to that of the dog" and, "the gibbon appears to be the animal of choice for studying heartworm infection in a primate host."

Dog heartworm has only very rarely been recorded in man. The best way to control it is not to seek alternate hosts, least of all rare animals, but through mosquito control and preventive medication for dogs, which is available.

ALTERNATIVES TO PRIMATES

It is the professional obligation of every researcher and pharmaceutical company using primates to keep abreast of the rapidly-developing field of non-animal based methods of research and production.

To assist scientists in keeping up-to-date, the Fund for the Replacement of Animals in Medical Experiments (FRAME) set out on a continuous search for information on alternative techniques, which include tissue, cell and organ cultures, computers, and use of lower organisms.

FRAME publishes a journal of **Abstracts on Alternatives to Laboratory Animals** twice yearly. Every institution using primates should have these abstracts available in its library and encourage researchers and members of utilisation and review committees to study them. Instead of 'thinking Primate', researchers should 'think Alternatives'.

Please draw the attention of your librarian to these abstracts. Subscriptions can be placed with the Secretary, FRAME, 312a Worple Road, London, SW20 8QU, England.

SAVE A MONKEY'S LIFE I

The production of standard polio vaccine is extremely costly in monkey lives. Vervet monkeys from Africa are killed in the production of the vaccine and Rhesus monkeys from India are killed in the testing process. A more modern and less wasteful method of polio vaccine production is the use of human diploid cell strains.

IPPL contacted Pfizer, which produces diploid cell-based vaccine, in search of further information. Dr. Cini, Pfizer's Director of Medical Services, informed IPPL:

the position is as follows. The number of monkeys used in the testing of the vaccines is the same for both types. However, Diplovax is prepared from

human tissue, while monkey tissue is necessary for the manufacture of monkey tissue vaccine. Overall, then, less monkeys are required for the production of Diplovax. We feel that Diplovax is as safe or safer than monkey kidney vaccine.

By making a point of using diploid cell polio vaccine, you would be saving vervet monkeys from the ordeal of capture, transportation and unnecessary death.

IPPL suggests that the sacrifice of monkeys in vaccine production should no longer be permitted in cases where safe alternative methods of producing the vaccine exist.

DID YOU KNOW ?

Did you know that

_____ a minimum of 70-80% of primates imported to the U.S. enter biomedical research and production ?

_____ around 50% of marmosets and night monkeys imported to the U.S. die in quarantine ?

_____ 61% of all monkeys imported to the U.S. for research are killed within one year ?

_____ 83% of all Rhesus monkeys imported to the U.S. are killed within a year ?

_____ laboratory monkeys are cheaper than laboratory dogs in the U.S. ?

_____ in 1973, 60% of monkeys imported to Canada from Malaysia died within a month of arrival ?

_____ only 57% of Rhesus monkeys born in breeding colonies are raised to six months ?

All this and much more useful information, is contained in the booklet *Nonhuman Primates*, available from ILAR, National Academy of Sciences, 2101 Constitution Av, NW, Washington, DC 20418, USA.

SUGGESTIONS

IPPL's Newsletter contains information you will find nowhere else. If it isn't in your library, talk to your librarian about subscribing. A membership in IPPL would make an ideal Christmas gift.

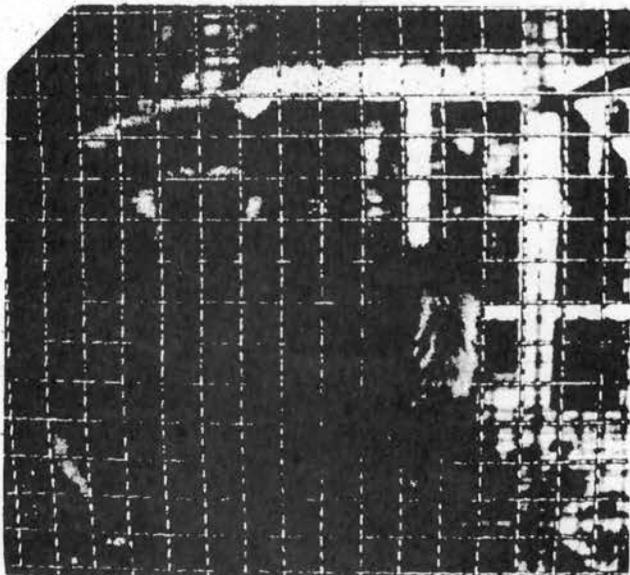
US ARMY GIBBON LABORATORY TO CLOSE DOWN

The US Army - Walter Reed Gibbon Laboratory in Bangkok, which once numbered around 200 gibbons, is now down to 40 survivors. Forbidden to export them, the Army wants to get rid of them by transferring responsibility for their upkeep to the Wildlife Conservation Division of the Royal Forestry Department. Along with the 40 gibbons, some disused laboratory cages and a six-month supply of monkey chow were offered. It was suggested to the Thais that they ask the World Wildlife Fund for money for the installation and upkeep of the gibbons, which will be extremely costly (close to \$ 1 per day per animal). The Army also suggested that the Thais release the animals, an extremely risky approach since

- these gibbons are habituated to man and might attack people or fall easy prey to hunters,
- gibbons are territorial and resident gibbons would attack and drive out newcomers,
- released gibbons might transfer human infections to wild populations; a conservation disaster,
- these gibbons, captured as infants, have no idea of jungle living, what foods are poisonous, gibbon social behavior, etc.

A long-term rehabilitation program would be extremely costly, as would establishing the gibbons in modern, well-designed habitats, and maintaining them satisfactorily. The Division of Wildlife Conservation cannot afford such an expense on its budget of \$ 200,000 per year. The US Army can. The Army assumed responsibility for these animals and cannot wash its hands of them now they have become a burden. We request IPPL's US members and friends to write to the Secretary of the Army, the Secretary of Defense, and their senators and congressmen demanding that the Army provide a substantial endowment for these animals, to ensure them a good future and in return for all the advantages the Army has derived

from the use of Thailand's rare gibbons in medical research. Please request also that the Army IN NO CIRCUMSTANCES be allowed to "put the gibbons to sleep", as an Army veterinarian proposed. This would be wanton destruction of threatened animals.



*Sad-Looking Gibbon at
Army Laboratory*

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HOW TO JOIN

Complete the form below and mail it with a cheque payable to the International Primate Protection League, to IPPL, PO Box 9086, Berkeley, Ca. 94709, USA. Membership applications in the United Kingdom should be sent to Dr. William McGrew, Department of Psychology, University of Stirling, FK9 4LA, Scotland.

- I wish to join IPPL as a () Sustaining Member - - \$ 25.00 or £ 10 or more
- () Regular Member - - \$ 7.50 or £ 3
- () Student Member - - \$ 3.00 or £ 1

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Please suggest names of people who would like to receive a complimentary newsletter.

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IPPL, PO Box 9086
Berkeley, Ca. 94709
USA



*The Director
Minnesota Zoological Garden,
Veterans Service Bldg.
Columbus Circle
St. Paul, Minn 55155*

PRINTED MATTER

June 29, 1976

Dear Don:

Appreciated and enjoyed our telephone conversation yesterday.

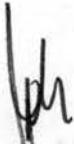
Later in the day Fred Zeehandelaar called, and among other things, he made some comments on the rare leopard subspecies studbook.

According to Fred, it would appear that A. Shoemaker has issued several cards on two animals that apparently should not be included. This involves an animal - I believe a female - in the Toronto Zoo, which is a cross; as well as an animal in Spain, which is a melanistic Indo-Chinese animal, erroneously carded as a N. Chinese leopard.

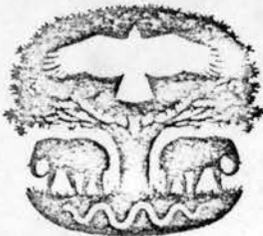
I offer this information simply to underscore my concern for the continued development and accuracy of the studbook, and urge you to again request that the data be incorporated into the ISIS system.

In my final report for this year as Conservation chairman, I will again request definite policy concerning studbooks, and if possible secure AAZPA and/or ISIS control of American studbooks.

Will appreciate being kept advised of any action taken concerning the above.



John M. Mehrtens, Chairman
AAZPA Wildlife Conservation Committee



Post Office Box 551, San Diego, California 92112
Telephone (714) 234-5151
Cable Address: SDZOO San Diego, California, U.S.A.

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Zoological Society of San Diego

June 30, 1976

Mr. Donald D. Bridgwater
Director
Minnesota Zoological Garden
Wentworth Office Center
33 East Wentworth Avenue
West St. Paul, Minnesota 55118

Dear Don:

Thank you for your most impressive analysis of the squirrel monkey situation in North American zoos. I would like to also add a Hallelujah! It's cold, hard data like yours from the ISIS program which will, at times, exonerate us so beautifully.

May I urge, as strongly as possible, this data be incorporated in a paper and published, perhaps in the Primate Newsletter of Brown University which is read by almost everyone working with or interested in primates. Possibly there is a better source of publication. Maybe it should be printed in the Newsletter, which is not an official publication as far as literature goes, and also published in a more permanent journal to boot. This is the kind of data we need to get to congressmen and influential people at critical times. It might be worthwhile to incorporate in the paper data on other commonly used laboratory and pet primates - for example, rhesus monkeys and other macaques. Can we get any figures from the government as to importation by species?

Again, thanks for jumping on this problem so effectively.

Sincerely,

Clyde

Clyde A. Hill
Curator of Mammals

CAH:sal

Don: My thanks also for this needed assistance. Can you follow up on Clyde's suggestion to get these data into publication? John Swierler

cc: Mr. Robert Wagner, AAZPA Headquarters
AAZPA Officers and Directors, Conservation Committee

September 14, 1976

Dear AAZPA ISIS Participant:

The ISIS system will be celebrating its third anniversary next month. Your institution is one of 111 active participants. An estimated 26,000 mammal specimens and 1,700 bird specimens are now on file. Thanks to you, our story is a success. In February your institution was sent its 1975 Inventory Report, Acquisition/Release Report, and ISIS Species Distribution Report. At that time an invoice for your annual zoo participation fee was enclosed. Since then, \$18,056 has been received from 74% of the active participants. The current billing of participation fees for your institution has not been received. This fee was made mandatory beginning 1 July 1975 by the AAZPA membership during the Philadelphia annual conference in 1974.

AAZPA ISIS has continued to make dramatic progress, demonstrating the professionalism of the AAZPA and providing a sound system to support the endeavors of good animal management by member institutions. AAZPA ISIS 1976 operating expenses are based upon anticipated receipts from all participants. Without this money, ISIS cannot continue to operate for the duration of 1976. Consequently, as President of AAZPA, Executive Secretary of AAZPA and Chairman of the AAZPA ISIS Committee, we would urge you to consider making the payment requested.

Sincerely,

John Werler, President

Robert Wagner, Executive Director

Donald Bridgwater, Chairman, AAZPA ISIS



American Association of Zoological Parks and Aquariums

EXECUTIVE OFFICES AT OGLEBAY PARK, WHEELING, W. VA. 26003 AREA CODE 304 - 242-2160

March 9, 1976

MEMORANDUM

TO: AAZPA - ISIS Committee

FROM: Donald D. Bridgwater, Chairman 
AAZPA - ISIS Committee

SUBJECT: Status Report on Committee Activities

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Houston, Texas 77002

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Cleveland, Ohio 44103

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Seneca Park Zoo
Rochester, New York 14621

EDWARD J. MARUSKA
Director
Cincinnati Zoo
Cincinnati, Ohio 45220

PAUL N. LINGER
Assistant Director
Denver Zoological Gardens
Denver, Colorado 80205

DENNIS A. MERITT
General Curator
Lincoln Park Zoological Gardens
Chicago, Illinois 60614

Attached please find a number of pieces of correspondence and comments relative to the ISIS program as well as this memo indicating summary status of committee activity and items for consideration. I would appreciate your review and response to the entire packet at your earliest convenience.

Mid Year Report

The Mid-Year Committee Report, together with recommendations, was presented to the AAZPA Board at its mid-year meeting in Wheeling with the following results:

The Board approved the tactical program and proposed operational budgets with a provision for future semi-annual and annual review, or as needed. It was further communicated that there was no possibility of making participation in ISIS a mandatory requirement for membership in the AAZPA but that encouragement of participation would be carried out.

The recommendation for placing of the Orang Studbook at San Diego, to be implemented by Marvin Jones, was approved.

President Werler has appointed the Chairman of the AAZPA - ISIS Committee to be the AAZPA's representative for one year to the Survival Service Commission Zoo Liaison Committee. This group will be organized during the SSC meeting in early May. Details of organization and function of this group will be worked out there and a report will be forthcoming. The intent here is to create a group which can provide data, evaluations and recommendations which can be used on an international basis with respect to the handling of specific problems. This might include, for instance, the creation of breeding groups of endangered species, the movement of animals from captive collections into wild populations and related matters. The data which is being collected by ISIS and the programs which are being pursued can be a most effective tool in this regard.

The Board could not see its way clear to provide any funding for ISIS. Our request to support the Studbook and Pedigree Analysis System in the amount of \$10,867 was rejected; basic problem here being that there was not, or is not, sufficient funds in the AAZPA coffers to justify this commitment at this time. This does have a serious impact on our ability to move that particular program along and we shall continue to seek the funds to expedite it.

Much discussion occurred considering the submission of the five petitions for reduction to Captive Self-Sustaining Population (CSSP) status on tigers, jaguars, leopards, ring-tailed lemurs and black lemurs. The basic situation was as explained in earlier communications. There are those who feel that the downgrading of an entire species without consideration for individual subspecies is wrong. There are, on the other hand, others who feel that blanket downgrading for all endangered species born since 1973 and held in qualified institutions should be exempted from control. At the present time these petitions, plus petitions on brown-eared, Edwards, Humes, Mikado, Palawan, Swinhoe's and white-eared pheasants, the nene, Hawaiian duck, Laysan teal, and masked bobwhite have been submitted and will be appearing in the Federal Register eminently with proposed regulations. In addition, it is my understanding that proposals attempting to establish certification requirements for institutions to traffic in captive-born endangered species have been presented and discussed in Washington. A copy of these criteria is also enclosed. In the meantime, ISIS will continue to collect data which could be used in support of petitions to downgrade species to CSSP status. In the future these recommendations will be reviewed by our committee, the Wildlife Conservation Committee, and the AAZPA Board prior to their submission for recommendation. The decision was made not to withdraw the five petitions mentioned earlier.

Current Status

At the present time we have received 32,982 mammal data forms from 109 institutions. We have received 678 bird data forms from 23 institutions and are continuing to mail sections of the taxonomy as they are completed. Sixty-one institutions paid their 1974 voluntary fee, and to date, 44 institutions have responded for the first year's mandatory fees. We have received voluntary fees of \$14,288 and have received \$9,950 under the mandatory fee arrangements. It is imperative that institutions continue to participate and support the program. Anything that you as members can do to encourage this will be greatly appreciated.

General Comments

The bird taxonomy and physiological norms program are progressing well. Funds are still needed to proceed with the studbook pedigree analysis system. More and more, this program promises to be a most effective tool in developing a

recommendation for captive animal management, setting up captive breeding groups, and the return of animal populations to the wild. We have been able to produce some initial studies and I am enclosing a summary of one of these. The Przewalski's horse studbook has been analyzed by computer program in a pedigree analysis establishing inbreeding coefficients and risk factors for each animal. The attached table graphs these inbreeding coefficients, both as an average and as a maximum for exceedingly high values. The sharp drop in the 1940-1949 section is a reflection of the loss of records due to a fire. It can be seen that within a 70 year period there have been tremendous amounts of inbreeding. Work is continuing along similar lines for the Arabian oryx and efforts are being made to develop demographic models which will answer the questions as to what constitutes a "safe captive population".

Summary evaluations of the 1975 reports have been made and will soon be available. In short, it would appear that the zoological gardens are doing an excellent job in areas of production and loss.

With regard to international expansion, materials have been mailed to a number of zoos mentioned in the Mid-Year Report. Apparently, the commitments are still a bit tentative and in a number of instances participation will not be forthcoming in the next year. At the present time Copenhagen and Rotterdam have finally agreed to enter the program and Marvin Jones will be participating in bringing the records up to date during the next year beginning in April. Marvin is also nearing completion on the orang data for inclusion in the ISIS program.

With regard to studbooks, I am enclosing a set of comments and recommendations from Alan Shoemaker relative to the studbook data sheet format. I am also enclosing a letter with comments from Marvin Jones on the same subject. I would ask members of the Studbook Sub-Committee to review these comments as well as those contained in the Mid-Year Report and provide responses as you see fit.

Also, I am enclosing a letter dated 18 February 1976 from Alan Shoemaker to John Werler containing a series of recommendations concerning studbook policies and would appreciate your specific responses on these items. One of our basic problems, of course, is where do we get additional funds to proceed; but we will keep chipping away and hopefully this will be successful.

Please accept apologies for the mass of information, but over the past year we have found that the most effective way to communicate is to transmit substantial examples of correspondence or individual thoughts involved in opinions and decisions relative to ISIS. Many thanks for your continued help and cooperation.

DDB/je

Enclosures

ISIS PARTICIPANTS

Mam. Forms Received
 Mammals Complete
 Bird Forms Received
 Paid '74 (voluntary)
 Paid 1975
 Birds Complete
 Mail 1975 SDR
 Mail Bird T+forms

Mam. Forms Received	Mammals Complete	Bird Forms Received	Paid '74 (voluntary)	Paid 1975	Birds Complete	Mail 1975 SDR	Mail Bird T+forms	Organization
			198.00					Abilene Zoological Gardens, Abilene, Texas
								African Lion Safari, Ferndale, Michigan
								African Lion Safari, Rockton, Ontario, Canada
✓	✓							Akron Children's Zoo, Akron, Ohio
				48.00				Alabama-Coachatta Indian Reservation, Livingston, Texas
								Alexander Lindsay Junior Museum, Walnut Creek, California
								Amarillo Zoological Society, Amarillo, Texas
								Amigita Grande Ranch, Houston, Texas
								Aqua Circus - Aquarium of Cape Cod, West Yarmouth, Massachusetts
✓			92.00	92.00				Arizona - Sonora Desert Museum, Tucson, Arizona
✓			400.00					Assiniboine Park Zoo, Winnipeg, Manitoba, Canada
			170.00	130.00				Atlanta Zoological Park, Atlanta, Georgia
			160.00					Audubon Park, New Orleans, Louisiana
✓			406.00					Baltimore Zoo, Baltimore, Maryland
								Bear Country, U.S.A., Rapid City, South Dakota
✓	✓	✓	83.00	109.00				Beardsley Zoological Gardens, Bridgeport, Connecticut
								Big Bell Ranch, Eads, Tennessee
✓	✓	✓	320.00	250.00				Birmingham Zoo, Birmingham, Alabama
								Boise City Zoo, Boise, Idaho
✓	✓							Boston Zoological Society, Dorchester, Massachusetts (3 zoos)
								Brookgreen Gardens, Murrells Inlet, South Carolina
								Warren E. Buck, Glendora, New Jersey
✓	✓		271.00	259.00				Buffalo Zoological Gardens, Buffalo, New York
✓			174.00					Burnet Park Zoo, Syracuse, New York
✓	✓							Busch Gardens, L.A., Van Nuys, California
✓								Buttonwood Zoo, New Bedford, Massachusetts
✓	✓			92.00				Caldwell Children's Zoo, Tyler, Texas
✓	✓		234.00	217.00				Calgary Zoo and Natural History Park, Calgary, Alberta, Canada
								Catoctin Mountain Zoological Park, Thurmont, Maryland
								Cedar Bluff Aquarium, Ellis, Kansas
✓	✓							Cen-Tex Zoo, Waco, Texas
								Cheyenne Mountain Zoo, Colorado Springs, Colorado
✓			800.00					Chicago Zoological Park, Brookfield, Illinois
✓			300.00	351.00				Zoological Society of Cincinnati, Cincinnati, Ohio
✓	✓		4.00	4.00				Cleveland Aquarium, Cleveland, Ohio
✓								Cleveland Zoological Park, Cleveland, Ohio (metroparks)
✓	✓			49.00				Cohanzyck Zoo, Bridgeton, New Jersey
✓			49.00					Cole Park Zoo, Midland, Texas
✓	✓	✓	182.00					Columbia Zoological Park, Columbia, South Carolina
✓								Columbus Zoological Gardens, Powell, Ohio
								Conservatory - Aviary, West Pittsburgh, Pennsylvania
✓								Crandon Park Zoological Garden, Key Biscayne, Florida
✓	✓							Dakota Zoological Society Inc., Bismarck, North Dakota
✓	✓							Dallas Zoo, Dallas, Texas
✓	✓			491.00				Denver Zoological Gardens, Denver, Colorado
								Detroit Zoological Park, Royal Oak, Michigan
✓	✓		100.00					Dickerson Park Zoo, Springfield, Missouri
✓				40.00				Dreher Park Zoological Gardens, West Palm Beach, Florida
✓	✓			255.00				Duke University Primate Facility, Durham, North Carolina
✓				108.00				Duluth Zoo, Duluth, Minnesota

City Park Zoo, Iowa City, Iowa

as of March, 1976

Mam. Fm. R.	Mamls. Comp	Bird f. Rec.	Paid '74 Vo	Paid 1975	Birds Compl	Mail '75 SDR	Mail BT+F	
✓	✓			32.00	✓			Ellen Trout Park Zoo, Lufkin, Texas
✓	✓				✓			Elmwood Park Zoo, Norristown, Pennsylvania
✓	✓	✓	100.00		✓			El Paso Zoological Park, El Paso, Texas
✓				5.00				Endangered Wildlife Research Program, Patuxent Center, Laurel,
✓	✓		74.00		✓			Erie Zoo, Erie, Pennsylvania
								Forest Park Zoo, Springfield, Massachusetts
								Fort Clark Zoo Farm, Brackettville, Texas
✓	✓	✓			✓			Fort Wayne Children's Zoological Gardens, Fort Wayne, Indiana
✓	✓	✓		155.00	✓			Fort Worth Zoological Park, Fort Worth, Texas
				19.00				Gilbert, Mr. and Mrs. Frank H., Phoenix, Arizona
✓	✓	✓	459.00	432.00	✓			Gladys Porter Zoo, Brownsville, Texas
✓	✓		107.00	79.00	✓			Glen Oak Zoo, Peoria, Illinois
								Granby Zoological Society, Granby, Quebec, Canada
✓	✓				✓			Great Plains Zoo, Sioux Falls, South Dakota
✓	✓				✓			The Greater Baton Rouge Zoo, Baton Rouge, Louisiana
✓	✓	✓	316.00					Henry Doorly Zoo, Omaha, Nebraska
✓					✓			Henry Vilas Park Zoo, Madison, Wisconsin
✓			281.00		✓			Highland Park Zoo, Highland Park, Pittsburgh, Pennsylvania
✓					✓			Hogle Zoological Garden, Salt Lake City, Utah
✓	✓				✓			Houston Zoological Gardens, Houston, Texas
								Indianapolis Zoological Society, Inc., Indianapolis, Indiana
								Inland Empire Zoo, Spokane, Washington
✓	✓		240.00	155.00	✓			Jackson Zoological Park, Jackson, Mississippi
✓	✓			213.00	✓			Jacksonville Zoological Park and Society, Jacksonville, Florida
✓	✓		220.00		✓			Jardin Zoologique de Quebec, Quebec, Canada
								Jungle Larry's African Safari, Naples, Florida
✓	✓	✓	38.00	41.00	✓			Kemper Zoological Park, Hattiesburg, Mississippi
✓	✓	✓	317.00	362.00	✓			Kansas City Zoological Gardens, Kansas City, Missouri
								Knowland Park Zoo, Oakland, California
✓				198.00	✓			Knoxville Zoological Park, Knoxville, Tennessee
✓	✓		85.00		✓			Lafayette Zoological Park, Norfolk, Virginia
								Las Vegas Valley Zoo, Las Vegas, Nevada
✓	✓				✓			Lee Richardson Zoo, Garden City, Kansas
✓	✓		57.00	51.00	✓			Lincoln Children's Zoo, Lincoln, Nebraska
✓	✓				✓			Lincoln Municipal Zoo, Lincoln, Nebraska
✓	✓			770.00	✓			Lincoln Park Zoo, Chicago, Illinois
								Little Rock Zoo, Little Rock, Arkansas
								Living Desert Reserve, Palm Desert, California
								Long Island Game Farm, Inc., Manorville, New York
✓	✓		480.00		✓			Los Angeles Zoo, Los Angeles, California
✓	✓			187.00	✓			Louisville Zoological Garden, Louisville, Kentucky
								Lummis Livestock Co., Cheyenne, Wyoming
								Marineland of the Pacific, Rancho Palos Verdes, California
✓	✓		29.00		✓			Marriott's Great America, Gurnee, Illinois
✓	✓	✓			✓			Mesker Park Zoo, Evansville, Indiana
								Miami Seaquarium, Miami, Florida
✓	✓		25.00		✓			Miller Park Zoo, Bloomington, Illinois
✓	✓				✓			Milwaukee County Zoo, Milwaukee, Wisconsin
✓	✓		8.00					Minnesota Zoological Garden, St. Paul, Minnesota
✓	✓	✓	96.00		✓			Montgomery Zoo, Montgomery, Alabama
								Mystic Marineliflife Aquarium, Mystic, Connecticut

Mam. F. Re.
Mamls. Comp.
Bird Frms. Re.
Paid '74 (vol 1)

Paid '75

Birds Complete
Mail '75 SDR
Mail Bird T+F

						National Aquarium, Washington, D.C.
		2.00	2.00			✓ National Marine Fisheries Service Aquarium, Woods Hole, Mass.
✓	✓	✓	480.00			✓ National Zoological Park, Washington, D.C.
✓	✓	✓				✓ Natural Science Center and Zoo, Inc., Greensboro, North Carolina
						New England Aquarium, Boston, Massachusetts
✓	✓	✓	749.00			✓ New York Zoological Society, Bronx, New York
✓	✓		10.00	12.00		✓ North American Predatory Animal Center, Doyle, California
✓	✓			8.00		✓ North American Wildlife Park Foundation, Inc., Battle Ground, Ind
				56.00		North Carolina Zoological Park, Asheboro, North Carolina
						Okanagan Game Farm, Penticton, British Columbia
✓	✓	✓	568.00			✓ Oklahoma City Zoo, Oklahoma City, Oklahoma
						Olympic Game Farm, Sequim, Washington
✓						✓ Opryland, U.S.A., Nashville, Tennessee
						Overton Park Zoo and Aquarium, Memphis, Tennessee
						Oxbow Park Zoo, Rochester, Minnesota
✓	✓	✓	374.00	355.00		✓ Parque Zoologico Nacional, Santo Domingo, Dominican Republic
✓	✓		168.00			✓ Philadelphia Zoological Garden, Philadelphia, Pennsylvania
✓	✓		163.00	168.00		✓ The Phoenix Zoo, Phoenix, Arizona
✓	✓	✓	221.00	251.00		✓ Pocono Wild Animal Farm, Stroudsburg, Pennsylvania
						Portland Zoological Gardens, Portland, Oregon
✓	✓					✓ Racine Zoological Park, Racine, Wisconsin
						Ralph Mitchell Zoo, Independence, Kansas
✓	✓		136.00	120.00		✓ Rancho Gango Musk Ox Farm, Hughenden, Alberta, Canada
						Randolph Park Zoo, Tucson, Arizona
✓			193.00			✓ Research Ranch, Elgin, Arizona
						Rio Grande Zoo, Albuquerque, New Mexico
			182.00			✓ Rock Island Co. Niabi Zoological Preserve, Moline, Illinois
✓	✓					✓ Roeding Park Zoo, Fresno, California
✓			75.00			✓ Roger Williams Zoo, Providence, Rhode Island
						Roosevelt Park Zoo, Minot, North Dakota
✓						✓ Ross Park Zoo, Binghamton, New York
						T. Rowell, Primate Research, Univ. of Calif., Berkeley, California
				225.00		Sacramento Zoo, Sacramento, California
✓	✓		531.00	430.00		✓ Safari Animal Country, Inc., Northumberland, New York
✓	✓		143.00			✓ St. Louis Zoological Park, St. Louis, Missouri
✓	✓		47.00	61.00		✓ St. Paul's Como Zoo, St. Paul, Minnesota
✓			740.00			✓ The Salisbury Zoo, Salisbury, Maryland
✓	✓		643.00			✓ San Antonio Zoological Gardens, San Antonio, Texas
✓			900.00	795.00		✓ San Diego Wild Animal Park, San Diego, California
						San Diego Zoological Garden, San Diego, California
✓	✓	✓	103.00			✓ San Francisco Zoo, San Francisco, California
✓	✓		48.00			✓ Santa Barbara Zoological Gardens, Santa Barbara, California
						Santa Fe Community College Teaching Zoo, Gainesville, Florida
						Scripps Aquarium, La Jolla, California
						Sea Life Park, Waimanalo, Hawaii
✓	✓	✓				✓ The Seattle Aquarium, Seattle, Washington
✓	✓	✓				✓ Sedgwick County Zoo, Wichita, Kansas
✓	✓		3.00	3.00		✓ Seneca Park Zoo, Rochester, New York
						John G. Shedd Aquarium, Chicago, Illinois

Mam. frms. Rec.
Mamls. Complet
Bird frms. Recv.

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Birds Complete
Mail '75 SDR
Mail Bird T+F

Mam. frms. Rec.	Mamls. Complet	Bird frms. Recv.	paid '74 (vol)	Paid '75	Birds Complete	Mail '75 SDR	Mail Bird T+F	
✓								Snyder's Darien Lake Zoo, Corfu, New York
✓								South Bend Zoo (Potawatomi Park), South Bend, Indiana
								Southwest Zoological Gardens, Mangum, Oklahoma
								Spring Creek Animal Farm, Elko, Nevada
								Stanislaus Zoological Society, Modesto, California
								Staten Island Zoo, Staten Island, New York
								Storyland Valley Zoo, Edmonton, Alberta, Canada
								Sunset Zoo, Manhattan, Kansas
✓								Terry Lou Zoo, Scotch Plains, New Jersey
								Toledo Zoological Gardens, Toledo, Ohio
✓	✓		127.00				✓	Topeka Zoological Park, Topeka, Kansas
✓	✓		606.00	861.00			✓	Metro Toronto Zoo, West Hill, Ontario
✓	✓						✓	Trailside Museums, Bear Mountain, New York
✓	✓	✓	193.00				✓	Tulsa Zoo, Tulsa, Oklahoma
✓	✓		194.00				✓	Turtle Back Zoo, West Orange, New Jersey
✓	✓						✓	Utica Zoo, Utica, New York
				18.00				Vancouver Public Aquarium, Vancouver, British Columbia
								Ven-Am Research Center, Cache, Oklahoma
								Vollrath Park Zoo, Sheboygan, Wisconsin
✓							✓	Warner Bros. Jungle Habitat, West Milford, New Jersey
		✓						Walt Disney World, Lake Buena Vista, Florida
✓	✓		12.00				✓	Wild Canid Survival and Research Center, St. Louis, Missouri
								The Wildlife Preserve, Largo, Maryland
✓	✓						✓	Woodland Park Zoological Gardens, Seattle, Washington
✓							✓	World Wildlife Safari, Winston, Oregon
								Zoo St. Felicien, St. Felicien, Quebec, Canada
✓								Busch Gardens, Tampa, Fla.

Jayana

Peter

Andwarp

Conan

Harold

Bob

Hans (at ...)

Paul ...

CONSERVATION - RESEARCH - EDUCATION - RECREATION
Philadelphia Zoological Garden

UNDER THE MANAGEMENT OF THE
Zoological Society of Philadelphia
34th STREET AND GIRARD AVENUE 19104



February 13, 1976

Business (215) 243-1100
General Information EV 7-6400

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Donald D. Bridgewater, Chairman
AAZPA-ISIS Committee
Minnesota Zoological Garden
West Saint Paul, Minnesota 55118

Dear Mr. Bridgewater,

I respectfully request a copy of the AAZPA-ISIS Committee mid-year Report, 20 January, 1976. As an officer in the AAZV and one who is participating in the development of a veterinary code for life history data, it would be quite helpful for me to have a copy of this report in my office files.

I trust that you will be able to honor this request and look forward to receiving a copy of the report at your earliest convenience.

Sincerely,

Wilbur B. Amand, V.M.D.

Wilbur B. Amand, V.M.D.
Senior Veterinarian/Curator
PHILADELPHIA ZOOLOGICAL GARDEN

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WBA/eb

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ISIS

*For publishing
in "Journal of Zoo Animal
Medicine" - sent to
Don Farot*

International Species Inventory System ^{Don}



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January 2, 1976

ISIS - A COLLECTING AND SHARING OF CAPTIVE ANIMAL STATISTICS

Modern day zoos are faced with the challenge of developing self-sustaining populations of captive exotic species and perhaps in selected instances of providing the only reservoir for species on the verge of extinction. To meet this problem it is necessary to develop policies for the management of gene pools over multiple generations and to collect data and share it. American and European zoos are confronting this challenge head on through the International Species Inventory System (ISIS). The collection of census and vital statistics data is presently being accomplished by ISIS of the American Association of Zoological Parks and Aquariums (AAZPA).

ISIS is housed at the Minnesota Zoological Garden offices, Wentworth Office Center, 33 East Wentworth Avenue, West St. Paul, Minnesota 55118, and will move to the zoo site in Apple Valley, Minnesota upon completion of this new facility (phone - (612)227-9216). Use of the IBM 370-158 computer, part of the state computer system, is also made possible through the relationship with the Minnesota Zoo. Personnel for ISIS includes Linda Murtfeldt, ISIS system manager and zoological records supervisor for MZG, and data processor, Kim Hastings.

The program currently has 185 zoos signed as participants. One hundred and six zoos are actively submitting data on their mammal collections. Seventy-three zoos have completed their inventories and are on a current basis. Data forms have been received on more than 26,000 mammals. Computer output inventories are being returned to all zoos who have completed submission of their data. The first national inventory of all data available to the system was completed in early May. Copies of this national inventory in a microfiche form have been returned to all participants who are submitting data.

Each participating zoo has been provided with a set of three manuals: the ISIS Mammalian Taxonomic Directory, the ISIS World Geographic and Zoological Institution Directory, and the ISIS Institution Procedures. The Mammalian Taxonomic Directory contains a listing of all living mammalian species, each taxon including the scientific name, a vernacular name, and the approximate distribution in the wild. The World Geographic and Zoological Institution Directory contains a hierarchical code system for the listing of all regions, subregions, countries, states and zoological institutions (zoos, aquariums, museums, dealers, special collections and researchers) throughout the world. The complete Avian Taxonomic Directory is near completion.

One data sheet is filled out for each animal within a zoo. This form contains information on taxonomy, individual identification, sire and dam, place of birth or capture location, sex, age, transactions which occur and between whom, hybrid status, death and autopsy information, tag and tattoo numbers, studbook identification, marine mammal permit numbers, postentry quarantine numbers, endangered species permit numbers, price and color phase. Each zoo keeps one copy of the form for its files and sends the original to ISIS. After review for completeness and accuracy by the system manager, the information is punched on keypunch cards and then sent to the computer for input.

The first steps in the revision of the SEAMAK physiological norms data system for inclusion in ISIS were taken at the AAZV meeting in Atlanta in 1974. At this time a group of veterinarians reviewed a proposed data form based upon the original SEAMAK form which was modified to a standard 8½x11" size. The second draft form based upon these discussions was prepared and circulated to the initial committee and several other veterinarians for comment and review. These comments were then collated and resulted in our first trial run data form. The format of this form is shown as figure #1. It is prepared in a manner similar to that of the ISIS New Inventory Data form. The first sheet is filled out with the required identification information for the animal and with the animal laboratory data. It should be stressed that not all laboratory data blanks have to be completed. Only the data available from the blood sample is required. This first sheet was printed on NCR paper which serves as its own carbon. The second sheet is heavier duty stock suitable for use as a permanent record and easily filed. The back of the second sheet contains ruled lines for entry of any other data the veterinarian may desire. One-thousand copies of this form were printed and distributed to 25 zoos currently participating in the mammals program of ISIS. The veterinarians were requested to complete some of the forms and on the basis of their experience report back to us with any suggestions or comments, and to submit the copies of the completed form. To date we have received forms from 13 veterinarians. Each participant was also sent a draft of a manual containing instructions on how to complete the form and with comments concerning the reasons for some of the data entries requested. The response from this trial-run is being used as the data base for systems analysis and eventually for computer programming. We cannot begin entering data into the computer data bank until programming is complete. We will transfer the data base in the SEAMAK computer program to the ISIS Physiological Norms program when these programs are completed.

It is planned that the output or reports will be prepared in two forms. Both will be distributed annually to all participants. The first will be a report back to the participating veterinarian and zoo on all data from their zoo arranged by species and by individuals within species. Note that this makes unique identification of each individual an imperative part of participation in the program. This can be accomplished by utilization of the ISIS Specimen ID number as provided on the norms data form. The second report will be a summary by species of all data in the data base. If data on more than ten animals are available for a given assay then the results will be presented in the form of a mean standard deviation and standard error. If fewer than ten data items are available, then simply the raw data will be presented. It will be possible to develop a more frequent reporting interval if this appears desirable as experience with the system is developed.

Data from sick or traumatized animals can also be included. The current data forms includes a set of categories indicating whether the animal is normal or abnormal. However, if maximum benefit is to be gained from use of the information from ill animals, it will be necessary to employ a coded diagnostic system to specify the illness or diagnosis. For this purpose we employ the Standard Nomenclature of Veterinary Diseases and Operations, First Edition (1966) and Coding Supplement (1971), U.S. Department of Health, Education, and Welfare, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. We cannot do this coding for the participants. This will necessitate your becoming familiar with the standard nomenclature and employing these forms if we are to build up a data base for specific diseases. This same nomenclature will be used in the autopsy subprogram to deal with death data.

The Physiological Norms program and all of its activities will be housed at the Minnesota Zoological Garden under the direction of the ISIS Systems Manager, Mrs. Linda Murtfeldt. This will provide an institutional base for the data system and avoid the vagaries of a research operation. We do not as yet know what it will cost to operate the system when it becomes functional. I would estimate a cost of about \$2,000-3,000 per year depending upon data volume. We have to date received \$18,000 for the development of the system in conjunction with the ISIS program. The cost for completion of the computer programming will be about \$8,000.

Other plans and developments of the ISIS system of interest to the zoo veterinarian include development of an autopsy program and a life history data program. The life history data program is being developed by a subcommittee chaired by Paul Linger of the Denver Zoo and includes a Veterinarian, Dr. Wilbur Amand of the Philadelphia Zoo. Dr. Amand has submitted a code for use by veterinarians which is available to any interested veterinarian who would provide us with additional input. Analysis of the current ISIS data base yields the indication that approximately 3,200 specimens die in zoo collections each year. Of these, approximately 1,600 received autopsies and some unknown fraction of these also receive histopathology diagnosis. Based upon this information and the request of a number of veterinarians and pathologists we now plan to develop an autopsy data program separate from the death code data included on the ISIS New Inventory Data form. It is our intention to develop this program in very close communication with Dr. Appleby and the World Health Organization (WHO) autopsy program currently being utilized in Europe. Most of the data included on the WHO form is currently a part of the ISIS data base except for the actual diagnosis and several observations on the condition of the specimen as received by the pathologist. The diagnoses are coded utilizing the standard nomenclature. Thus, it should be very easy to incorporate an autopsy program into our current ISIS data system, if a sufficient number of veterinarians and veterinary pathologists wish to cooperate and participate. If you have any comments or suggestions to make please send them to us in care of Mrs. Linda Murtfeldt at the ISIS office. We will then report back to the AAZV by way of the Journal of Zoo Animal Medicine.



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December 3, 1975

MEMO TO: Mr. John Werler, President, AAZPA
Mr. Robert Wagner, Executive Secretary, AAZPA
Mr. John Mehrrens, Chairman, Wildlife Conservation Committee, AAZPA
Mr. William Braker, Chairman, Legislation Committee, AAZPA
Members, AAZPA, ISIS Committee
Members, AAZPA, Wildlife Conservation Committee

FROM: AAZPA - ISIS Committee
Donald D. Bridgwater, Chairman

SUBJECT: Captive Self-sustaining Populations Petition Submitted to USDI.

On November 14, 1975, ISIS, on behalf of the AAZPA, submitted petitions with supporting data for change of status of five endangered species to captive self-sustaining populations in accordance with Paragraph 17.7 of the Endangered Species Act, December, 1973, as published in the Federal Register, Vol. 40, No. 188, September 26, 1975, page 44417.

The species included were: Panthera tigris (tiger), Panthera pardus (leopard), Panthera onca (jaguar), Lemur catta (ring tailed lemur), and Lemur macaco (black lemur).

The USDI has indicated that its legal department will review past permit requests for these species and the petitions will then appear in the Federal Register immediately. There will then be a 60 day comment and review period with action anticipated in March, 1976. This type of procedure was discussed in Calgary and later discussed in Washington, and the action has now taken place.

Currently, procedures exist, as published in the Federal Register, Vol. 40: 188;9:26:1975, page 44426, Section 17.33, for appropriate institutions to apply for two-year permits to conduct sale, exchange or transfer of such C/P populations between licensed institutions. The mechanism to handle such requests are not currently extant, and it is imperative that if such valid requests and applications are made now, test cases will simplify and make effective procedures possible. It will also provide solid documentation for consideration in further congressional oversight hearings scheduled in December or January.

It would now be appropriate for every zoo meeting the basic qualifications to submit applications for C/P permits for the above species when they appear in the Register in order to assist in the establishment of procedures and further ease the situation.

2.

As a result of this review, a number of observations have been submitted by interested parties, and they boil down to two:

1. There is still a great amount of time and paper work involved in making these permit applications, and there has been the hope that some broad range rule-making might provide blanket permits to be issued for all C/P species, or even for all species on the lists currently being managed in zoo collections. This is perhaps a possibility, but certainly not in the foreseeable future and certainly not without solid data and logic to support it. Thus, we feel the approach outlined above is an absolute necessity.

2. The USDI's definition of a C/P species refers to the species in general and does not include the races or subspecies, many of which are clearly not self-supporting yet in captivity, for instance, the Persian leopard, Amoy tiger, black lemur, red-fronted lemur, etc. We must remember that the USDI's C/P definition is not the definition which we as animal management personnel would make to manage a population. However, the current rule-making will not change requirements for any import of such species from the wild or the taking of any animals from wild populations, or the criteria for acquiring such animals. Also, our professional responsibility is to make sure that efforts to manage such populations of these subspecies or any species is done in an intelligent way, thus preventing or minimizing any use of the precious reservoirs which we are privileged to husband.

Thus, within the allowed rule-making, we have an opportunity to use both numbers and logic to ease the restrictive situation, and further, to demonstrate our ability to act responsibly within our own professional group.

I have reviewed the situation with appropriate AAZPA leadership and had hoped that this letter could have been sent out earlier, but, in summary, there is a need for procedural test cases, the provision of good data, and a concerted effort on the part of the AAZPA to demonstrate ability to manage our own resources effectively.

The data contained in the petitions to the USDI will be published in the January Newsletter, and a status summary on future development programs for ISIS will be forwarded in late December.

If there are particular concerns, please respond.

- - -

SUMMARY STATEMENT OF PETITIONS
Submitted to the U. S. Department of the Interior
November 14, 1975

INTRODUCTION

On November 14, 1975, the AAZPA - ISIS Committee submitted five petitions to the Department of the Interior requesting change of status for five species of mammals listed as rare and endangered [Panthera tigris (tiger), Panthera pardus (leopard), Panthera onca (jaguar), Lemur macaco (black lemur), and Lemur catta (ring-tailed lemur)] to captive self-sustaining population status.

The following is a condensation of the statements and data presented separately in each of these five petitions:

GENERAL STATEMENT

The International Species Inventory System Committee (ISIS) of the American Association of Zoological Parks and Aquariums (AAZPA) requests your consideration of _____ for designation as a captive self-sustaining population according to paragraph 17.7 "Captive Self-Sustaining Populations" of the regulations governing "Endangered and Threatened Wildlife and Plants", as published in the Federal Register, Volume 40, Number 188, Friday, September 26, 1975, page 44417.

The ISIS Committee is an official committee of the AAZPA charged with the responsibility of collection of census and vital statistics information on wild animals held in captivity in zoos in the United States and other participating countries. These data are summarized annually in the form of the ISIS species inventory. This inventory is produced on a calendar basis. The data in the following material are derived from the report covering the year 1974, as produced on August 28, 1975. This report contains a summary of information on 14,345 living animals from 40 percent of the American zoos. The total population of mammals held in captivity in the United States is estimated at approximately 36,000 based upon data received from 176 zoos in this country, and based on data published in the AAZPA membership director, Zoos and Aquariums in the Americas, 1974-1975.

The information in the following report is presented in terms of the actual number of animals of each species currently included in the ISIS inventory and as a projected estimate of the total number of animals actually held in captivity in the United States. This total is obtained by multiplying the inventory number by a factor of 2. Several evaluations suggest a factor of 2.5 could be used with accuracy, but in an attempt to establish conservative numbers, a factor of 2 is used.

It is the recommendation of the ISIS Committee that the following species be favorably considered for reduction in status to that of a captive self-sustaining population on the basis of the data presented, and be treated as "threatened" wildlife.

These data indicate that the goals of maintaining the population of this species and producing a surplus have been obtained. The current development of explicit breeding management strategies, the ability to exchange animals readily between qualified zoos, and the continuing development of the AAZPA - ISIS data base assure continued success. Hence, we maintain that this population is capable of being designated as a captive self-sustaining population.

GENERAL DATA SUMMARY

I. Approximate Number of Specimens Existing in Captivity in the U.S.A.

<u>Species</u>	<u>Inventory No.</u>	<u>Projected Inventory No.</u>
Tiger	289	578
Leopard	217	434
Jaguar	141	282
Black lemur	146	292
Ring-tailed lemur	169	338

II. Age and Sex Ratios of Captive Specimens (Inventory Numbers).

<u>Species</u>	<u>Age</u>	<u>Sex Ratio</u>
Tiger	103-1yr; 36-2yr; 16-3yr; 17-4yr; 16-5yr; 54-10yr; 28-15yr; 14-20yr; 5 more than 20yr.	1/1.3
Leopard	52-1yr; 13-2yr; 13-3yr; 16-4yr; 20-5yr; 70-10yr; 19-15yr; 8-20yr; 6 more than 20 yr.	1/1.1
Jaguar	31-1yr; 18-2yr; 9-3yr; 12-4yr; 13-5yr; 33-10yr; 17-15yr; 5-20yr; 3 more than 20 yr.	1/1.0
Black lemur	21-1yr; 11-2yr; 17-3yr; 18-4yr; 19-5yr; 29-10yr; 21-15yr; 1-20yr; 9 more than 20 yr.	1/1.1
Ring-tailed lemur	24-1yr; 13-2yr; 18-3yr; 15-4yr; 16-5yr; 55-10yr; 18-15yr; 3-20yr; 2 more than 20 yr.	1/1.4

III. Number of Persons Who have Successfully Propagated the Species in Captivity.

<u>Species</u>	<u>INSTITUTIONS</u>		<u>Successful Propagation</u>	
	<u>Inventory No.</u>	<u>Projected No.</u>	<u>Inventory No.</u>	<u>Projected No.</u>
Tiger	54	108	25	50
Leopard	52	104	18	36
Jaguar	46	92	12	24
Black lemur	9	18	2	4
Ring-tailed lemur	26	52	10	20

IV. Number of Generations of Species Successfully Bred in Captivity.

According to records in Multiple Generation Births of Wild Animals, International Zoo Yearbook, Nicole Duplaix-Hall (Editor) Vol. 13:1973, pp. 408-409, the greatest number of generations recorded to be bred in captivity is for tigers 4, leopards 4, jaguars 4, black lemurs 5, and ring-tailed lemurs 3.

V. Comment on Likelihood that Persons Owning or Controlling Such Species Will Cooperate to Insure their Continue Existence and Reproduction.

The following answer was submitted for each species: "The AAZPA's ISIS program initiated in October, 1973, has as its explicit purpose insuring of the continued existence and reproduction of endangered species, in this case, the _____. The development of a studbook and pedigree history program, authorized by the AAZPA at their Annual Meeting in Calgary, Alberta, Canada, in September, 1975, will provide the data for long term management of these animals in captivity."

VI. Number of Requests to Take or Import Wild Specimens of These Species During the 24 Months Prior to the Date Consideration of the Species was Undertaken.

The AAZPA Wildlife Conservation Committee has reviewed no (0) requests during the past 24 months to take or import wild specimens of tigers, jaguars, black lemurs, or ring-tailed lemurs. The Committee reviewed one (1) request to import a wild specimen of Afghanistan (Persian) leopard by the Lincoln Park Zoo, Chicago, Ill.

VII. Ratio of Wild-Born vs. Captive Specimens in Captivity.

<u>Species</u>	<u>Sample Size</u>	<u>No. Wild Born</u>	<u>No. Captive Born</u>	<u>Origin Unknown</u>	<u>Ratio</u>
Tiger	144	2 (2%)	133 (92%)	9 (6%)	1/67
Leopard	90	5 (5%)	64 (71%)	21 (23%)	1/13
Jaguar	60	1 (2%)	43 (71%)	16 (27%)	1/43
Black lemur	140	26 (19%)	106 (76%)	8 (5%)	1/4
Ring-tailed lemur	110	9 (8%)	88 (80%)	13 (12%)	1/10



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SUBJECT: Computer Data Committee Meeting Minutes

DATE: September 14, 1975

TIME: 11:00 A.M.

PLACE: Calgary, Alberta, Canada - AAZPA Meeting

Those in attendance included:

David Banks (Calgary)
Judith Block (National)
Don Bridgwater (St. Paul)
Peter Covey (Omaha)
Paul Linger (Denver)
Dale Makey (Minneapolis)
John Mehrtens (Columbia)
Linda Murtfeldt (St. Paul)
Marialice Seal (Minneapolis)
Ulie Seal (Minneapolis)
Lee Simmons (Omaha)
Dave Zucconi (Tulsa)

The meeting was opened by Seal who gave a review of the process of the past year and summarizing the current status of ISIS. The work being done on programs under development and the needs of these programs for the immediate future were summarized. A copy of this review and summary is attached.

Seal then reviewed a meeting held with staff of the Office of Endangered Species, USDI, concerning data needed and methods of presentation for proposals to identify captive self-sustaining populations of certain endangered species which might then be designated threatened species and given special treatment under this designation. The currently proposed regulations for this category would allow licensed or qualified institutions to buy and sell animals of these populations with the only requirement being the completion of a record form, one copy of which would be kept by the seller, one by the buyer, and a third sent to the USDI for eventual passing on to ISIS office. This would greatly simplify the movement of these animals in this country. Species suggested for such designation include the jaguar Panthera onca, the leopard Panthera pardus, the tiger Panthera tigris, the ring-tailed lemur Lemur catta, and the black and brown lemurs Lemur macaco. The committee unanimously agreed that it should be recommended to the AAZPA that such action be taken as soon as possible.

The ISIS office would then undertake to prepare these proposals and submit them formally to the director of the Fish and Wildlife Service as per the appropriate regulations in the Federal Register, Volume 40, Number 188, Friday, September 26, 1975, page 44417 (see xerox of page 44417 enclosed).

The need for communication with zoos and zoological parks not yet participating in the ISIS program was discussed. Seal indicated that a letter had been sent to the ownership of seven zoological parks not as yet participating. Three of these organizations agreed to participate, one had refused and three had not as yet answered. Mehrtens had indicated that some zoos may be reluctant to become involved in ISIS because of uncertainty as to the composition of their collections and the lack of personnel to handle the data forms. He suggested that perhaps that the country could be divided up into regions and a participating zoo in each region be designated as a resource to any zoo with problems in order to help them get started in the system. All those present indicated they would be willing to help any non-participating zoo which would participate if assistance were offered. It was also suggested that participating zoo directors and their personnel might wish to talk with personnel and directors of non-participating zoos to find out the individual reasons for nonparticipation and then offer any assistance possible to get them started in the program. It was pointed out that although it would be very desirable to have complete participation, the data base is adequate with the current participants to allow very accurate estimates of the populations of the respective species being held in captivity in this country.

Mehrtens invited the Computer Data Committee to attend the meeting of his Conservation Committee and help in setting up a studbook committee.

The following series of agenda items were then discussed:

1. New Inventory Data Forms

- a. It was agreed that 2 copies per form, one for the zoo and the second for ISIS, were sufficient. Any zoo wanting additional copies can duplicate them.
- b. The desirability of all numeric characters in the Specimen ID numbers was explained in detail. A letter from St. Paul's Como Zoo was read which also urged this kind of decision. All present agreed to change their ID systems if incompatible and all zoos would be urged to do likewise.
- c. The importance of V/R Specimen ID's was stressed as a necessary link in the future building of family trees. Several suggestions for handling the problem were presented. These included preparing a standardized form to be used in all inter-zoo transactions, telephone calls upon the arrival of a new animal, use of accompanying health certificates and use of required USDA forms to record numbers. The ISIS Specimen ID from both participating zoos could be included in any of these suggested ways.

- d. In order to prepare the annual zoo inventories as close to the first of the year as possible, January 15, 1976 was designated as the last day the ISIS office would accept data forms for the 1975 inventory. Invoices for the payment of the yearly fee will accompany each zoo's inventory report.
- e. It was suggested by some participants that autopsy information be reported on the National Species Report. A special sub-program is needed to change this on the computer. The matter of autopsy data storage and reporting will be further analyzed with the AAZV.
- f. The need for entering large herds or flocks was discussed. It was the concensus that "what's common today is gone tomorrow". It was felt that all possible individual animals in a collection should be added to the system because of the need for the best possible census data and pedigree information for long-term genetic management.
- g. Taxonomic revisions to the mammal directory were discussed and it was decided, on the basis of advice from professional taxonomists, to minimize any effort to keep the directory current with the taxonomic literature. ISIS will make the changes necessary to correct errors and to revise some unsatisfactory arrangements. An effort will be made to extend, revise and standardize the vernacular names.

Avian Addition

- (1) Requests for second sets of ISIS directories have been made from zoos where several different individuals handle the zoo's animal records. All institutions must pay for extra sets of directories.
- (2) It was nearly unanimous that the avian taxonomy should be developed to the subspecies level for those families and orders where such distinctions are of importance for captive collections. A suggested list for such expansion, provided by Stephen R. Wylie, is as follows:
 1. The family Phoenicopteridae (Flamingoes).
 2. The family Anatidae (ducks, geese and swans).
 3. There are two families in the order Galliformes, Cracidae (Curassow) and Phasianidae (Pheasants).
 4. The family Gruidae (Cranes).
 5. The family Psittacidae (Parrots and related species).

Any further suggestions are welcome. We will be requesting assistance in this project from curators.

- (3) The question of how to record a bird's parent(s) when you can't tell the sexes apart was discussed. This will have to be provisionally assigned by each individual zoo until such time as reliable sex data are available.
- (4) Several requests for a different colored data form for birds were received. Color availability and additional costs will be investigated further before a decision is made.

Requests for Information

ISIS has received numerous requests asking for information on specific species and their whereabouts. It was the concensus of committee members that all such requests should be referred to the closest participating zoo where they could obtain access to a copy of the National Species Inventory Report.

Life History Subsystem

- (1) It was suggested that we maintain a low profile in this area for the next year until zoos complete their mammal inventories and become fully familiar with the vital statistics portion of ISIS.
- (2) The codes need a great deal of expansion. This will be discussed at a later subcommittee meeting.
- (3) The species used in this subsystem should possibly be limited to studbook animals or species shown on the national report to be non-reproducers. This, too, will be later discussed at a subcommittee meeting.

The meeting was adjourned at 1:45 P.M.

Respectfully submitted,

Linda E. Murtfeldt
U.S. Seal
Dale G. Makey



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SUBJECT: Open Meeting of the Computer Data Committee
DATE: September 14, 1975
TIME: 2:00 PM
PLACE: Calgary, Alberta, Canada - AAZPA Meeting

Approximately 65 persons attended this meeting.

The meeting was opened with a preliminary introduction and remarks by Ulie Seal covering the events of the past year and the progress of ISIS. This was followed with a summarization of the topics and discussion of the Computer Data Committee which had been meeting for the previous two hours (see enclosed minutes).

The meeting was opened for comments and questions. The following additional items were discussed:

- 1). Herps will be added to the system in approximately one year after currently participating zoos have completed their bird and mammal inventories.
- 2). Revision of the death codes is in the process. Proposed new codes have been distributed to participants for comments.

According to the National Species Report, autopsies were performed on 55% of the recorded deaths. We plan to work with Dr. Appleby of London. We will use the Standard Nomenclature. Until a revision is made, please continue to use the existing codes and place additional comments and information in the comment section.

- 3). The possibility of using the ISIS system as the data base for producing the data output for all studbooks is being explored. We have requested \$3,000 from the AAZPA's Board of Directors to begin the computer systems analysis for such a subsystem during the next year. It is anticipated that the complete development will require about \$10,000.

- 4). Lee Simmons has been invited to give a presentation on ISIS at the meeting of the International Union of Directors of Zoological Gardens (IUDZG) being held in Colorado Springs in October.

An article about the ISIS system has been accepted and will be published in the 1976 addition of the International Zoo Yearbook. The article ends with an invitation to participate by any zoological institution in the world.

- 5). The USDI has indicated that it may be willing to accept an individual zoo's annual ISIS zoo inventory and acquisition/release summary as a portion of the recording procedures required for endangered species permits. It is each zoo's responsibility to check this procedure out and to supply a copy of their inventory report to the USDI, if they so desire. ISIS will not be transmitting this information.
- 6). We have asked the AAZPA Board of Directors to formulate a policy statement regarding member zoos which are not participating in ISIS.
- 7). ISIS can not handle telephone demand reports for information. This kind of operation is too expensive for our modest budget.
- 8). The yearly cost to a participating zoo, which has a mammal collection, for the addition of birds to their inventory will be approximately 35¢/bird.
- 9). It is the concensus of the committee that any zoo using a specimen ID system which contains alphabetic characters should change these to all numeric numbers. This will result in greater efficiency and economy and will facilitate the addition of a life history-pedigree analysis subsystem. Please contact ISIS system manager, Linda Murtfeldt, (612) 227-9216, before beginning this change procedure, so that we may more easily coordinate this task.
- 10). V/R Specimen ID's were discussed. It was agreed that all ISIS participants should strive to obtain this information when any animal transactions take place. It was pointed out that many animals are bought and sold through dealers who are not ISIS participants and who do not assign specimen ID's to the animals they deal with. It is also often difficult to find out where an animal has come from and where it is going. It was suggested that this missing link could be handled by simply refusing to deal with a dealer who won't divulge where an animal came from or where it will be going so that V/R Specimen ID's can be obtained.

The meeting was adjourned at 4 PM.

Respectfully submitted,

Linda E. Murtfeldt
U.S. Seal
Dale G. Makey

wildlife for consumption or for the creation and sale of authentic native articles of handicrafts and clothing:

if the taking is primarily for subsistence purposes, and is not accomplished in a wasteful manner.

(b) Edible portions of endangered or threatened wildlife taken or imported pursuant to paragraph (a) of this section may be sold in native villages or towns in Alaska for native consumption within native villages and towns in Alaska.

(c) Non-edible by-products of endangered or threatened wildlife taken or imported pursuant to paragraph (a) of this section may be sold in interstate commerce when made into authentic native articles of handicrafts and clothing.

§ 17.6 State cooperative agreements. [Reserved]

§ 17.7 Captive, self-sustaining populations.

(a) Whenever the Director determines that a captive, self-sustaining population of otherwise endangered wildlife exists within the United States, such population may be treated as threatened and may be listed in § 17.11. Each

such listing shall bear the notation "(C/P)" following the designation of status, to indicate that the reason for treating it as threatened rather than endangered was the attainment of a captive, self-sustaining population within the United States.

(b) The listing of species as threatened because they are captive, self-sustaining populations within the United States shall follow the same procedures as required in section 4(f) of the Act for the listing of endangered or threatened species, except that captive wildlife shall not be considered to be "resident" wildlife within the meaning of section 4(b)(1) of the Act.

(c) In determining whether to list a species as threatened because it is a captive, self-sustaining population, the Director shall consider the following factors:

- (1) The approximate number of specimens of that species that exist in captivity in the United States;
- (2) The age and sex ratios of such captive specimens;
- (3) The number of persons who have successfully propagated the species in captivity;

(4) The number of generations of the species that have been successfully propagated in captivity;

(5) The likelihood that persons owning or controlling such captive specimens will cooperate in insuring the continued existence of and reproduction among such captive specimens;

(6) The number of requests to take or import wild specimens of the same species received during the 24 months immediately prior to the date consideration of the species was undertaken;

(7) The ratio of wild born versus captive born specimens of the species in captivity in the United States; and

(8) Such other factors as he deems appropriate.

(d) Permits shall be available pursuant to § 17.33 for persons who wish to engage in otherwise prohibited activities with specimens of wildlife listed as threatened under this section.

Example. Although the XY pheasant is endangered in the wild and has been determined to be an endangered species, the Director determines that there exists in the United States a captive, self-sustaining population of the pheasant which constitutes no drain on the wildlife population. After following the proper procedures, the pheasant would be listed in § 17.11 as follows:

SPECIES			RANGE		Status	When Listed	Special Rules
Common Name	Scientific Name	Populations	Known Distribution	Portion of Range Where Endangered or Threatened			
XY pheasant Do	<i>Gigantus smallus</i> do	N/A In captivity in U.S.	Southeast Asia N/A	Entire Entire	E T(C/P)	5 6	N/A N/A

Subpart B—Lists

§ 17.11 Endangered and threatened wildlife.

(a) The list in this section contains all the species of wildlife which are determined by the Director or by the Secretary of Commerce to be endangered or threatened. It also contains species of wildlife treated as endangered or threatened because they are similar in appearance to an endangered or threatened species (see Subpart E) or because they constitute a captive, self-sustaining population (see § 17.7).

(b) The columns entitled "Common name", "Scientific name" and "Population" define the "species" of wildlife within the meaning of the Act. Thus, two different geographic populations of the same subspecies or species will be identified by their differing geographic boundaries, even though the common and scientific names are identical for both entries. The same is true for two different color phases, identified by their unique colors. The prohibitions in the Act and in this Part 17 apply to all specimens of the "species" listed, wherever they are found, and to their progeny. Although common names are included, they cannot be relied upon for identification of any specimen, since they vary greatly in local usage.

(c) If the "status" column has an "E", that species is thereby designated as endangered. If the "status" column has a "T", that species is thereby designated as threatened. The addition of the letters "S/A" in parentheses indicates that the reason for designating the species as endangered or threatened is its similarity in appearance. The addition of the letters "C/P" in parentheses indicates that the reason for designating the species as threatened is that it constitutes a captive, self-sustaining population.

(d) For information purposes only, the "known distribution" column will indicate the normal, known distribution of a species, subspecies, or a smaller taxon. This column does not imply any limitation on the application of the prohibitions in the Act and in this Part 17. Such prohibitions apply to all specimens of the species, wherever found.

(e) The column entitled "Portion of the range where endangered or threatened" designates that portion of the range of the species over which it is endangered or threatened. The Act requires that the species must be endangered or threatened over all or a significant portion of its range in order to be listed. When a species is listed because it is similar in appearance to an endangered or threatened species, this requirement does not apply. Therefore, the notation

"N/A" (not applicable) will appear in this column.

(f) For information purposes only, the "When listed" column provides a footnote reference to the date and location of the FEDERAL REGISTER publication actually listing the species. That publication will include a statement indicating the basis for the current status.

(g) The "special rules" column is a reference to any special rules. The letters "N/A" (not applicable) appearing in this column indicate that there are no such special rules which apply to that species. However, all other appropriate rules in this Part 17 still apply to that species. In addition, there may be other rules in this Subchapter B (Parts 10-22) that also relate to such wildlife, such as port-of-entry requirements, etc. It is not intended that the references in the "Special rules" column list all the regulations of the Service which might apply to the wildlife in question, or the regulations of other Federal, State or local agencies.

(h) The listing of a particular taxonomic group includes all lower taxonomic groups. Example: If the genus *Felis* was listed, all species, subspecies, races, and populations of that genus are considered to be listed. If the species *Felis concolor* was listed, all subspecies, races, and populations of that species are considered to be listed.

Laboratory Data

Common Name
Scientific Name

SPECIMEN ID
ZOO IDENTIFICATION



Physiological Norms

Common Data

CC1 A 1	CC4 (1) TAXONOMIC CODE	CC20 (2) INSTITUTION CODE	CC29 (3) SPECIMEN ID
CC35 (4) TRANSACTION DATE	CC41 (5) SEX	CC42 (6) BODY TEMP. °C	CC46 (7) WEIGHT-kg
		CC50 (8) TIME	

Hematology

<input type="checkbox"/>	<input checked="" type="checkbox"/>	HCT %
<input type="checkbox"/>	<input checked="" type="checkbox"/>	WBC 10 ³ /mm ³
<input type="checkbox"/>	<input checked="" type="checkbox"/>	HGB g%
<input type="checkbox"/>	<input type="checkbox"/>	RBC 10 ⁶ /mm ³
<input type="checkbox"/>	<input type="checkbox"/>	MCV μm ³
<input type="checkbox"/>	<input type="checkbox"/>	MCHC VOL %
<input type="checkbox"/>	<input checked="" type="checkbox"/>	MCH μm/μg
<input type="checkbox"/>	<input type="checkbox"/>	Nucleated RBC

Differential

<input type="checkbox"/>	<input checked="" type="checkbox"/>	SEGS 10 ³ /mm ³
<input type="checkbox"/>	<input checked="" type="checkbox"/>	BANDS 10 ³ /mm ³
<input type="checkbox"/>	<input checked="" type="checkbox"/>	LYMP. 10 ³ /mm ³
<input type="checkbox"/>	<input type="checkbox"/>	MONO. /mm ³
<input type="checkbox"/>	<input type="checkbox"/>	EOSIN. /mm ³
<input type="checkbox"/>	<input type="checkbox"/>	BASO. /mm ³
<input type="checkbox"/>	<input checked="" type="checkbox"/>	RET. % RBC
<input type="checkbox"/>	<input type="checkbox"/>	PLAT. 10 ³ /mm ³

RBC Morphology

Chemistry

<input type="checkbox"/>	<input checked="" type="checkbox"/>	MG mg %
<input type="checkbox"/>	<input type="checkbox"/>	CHOL. mg %
<input type="checkbox"/>	<input checked="" type="checkbox"/>	CA mg %
<input type="checkbox"/>	<input checked="" type="checkbox"/>	PHOS. mg %
<input type="checkbox"/>	<input checked="" type="checkbox"/>	T.BIL mg %
<input type="checkbox"/>	<input checked="" type="checkbox"/>	U. ACID mg %
<input type="checkbox"/>	<input type="checkbox"/>	BUN mg %
<input type="checkbox"/>	<input type="checkbox"/>	GLU. mg %
<input checked="" type="checkbox"/>	<input type="checkbox"/>	CREAT. mg %
<input type="checkbox"/>	<input type="checkbox"/>	MA meq/l
<input checked="" type="checkbox"/>	<input type="checkbox"/>	K meq/l
<input type="checkbox"/>	<input type="checkbox"/>	Cl meq/l
<input type="checkbox"/>	<input checked="" type="checkbox"/>	HCO ₃ meq/l
<input type="checkbox"/>	<input type="checkbox"/>	LDH I.U.
<input type="checkbox"/>	<input type="checkbox"/>	SGOT I.U.
<input type="checkbox"/>	<input type="checkbox"/>	SGPT I.U.
<input type="checkbox"/>	<input type="checkbox"/>	CPK I.U.
<input type="checkbox"/>	<input type="checkbox"/>	ALK. PTASE I.U.

Electrophoresis

<input type="checkbox"/>	<input checked="" type="checkbox"/>	T.PRO. g %
<input checked="" type="checkbox"/>	<input type="checkbox"/>	γGLO. g %
<input checked="" type="checkbox"/>	<input type="checkbox"/>	βGLO. g %
<input checked="" type="checkbox"/>	<input type="checkbox"/>	α ₂ GLO. g %
<input checked="" type="checkbox"/>	<input type="checkbox"/>	α ₁ GLO. g %
<input checked="" type="checkbox"/>	<input type="checkbox"/>	ALBUMIN g %

Blood Gases

<input type="checkbox"/>	<input type="checkbox"/>	PO ₂ mmHg
<input type="checkbox"/>	<input checked="" type="checkbox"/>	PCO ₂ mmHg
<input type="checkbox"/>	<input checked="" type="checkbox"/>	pH
<input type="checkbox"/>	<input type="checkbox"/>	HCO ₃ meq/l

Hormones

<input type="checkbox"/>	<input checked="" type="checkbox"/>	THYROXINE μg%
<input type="checkbox"/>	<input checked="" type="checkbox"/>	CORTISOL μg%
<input type="checkbox"/>	<input type="checkbox"/>	TESTOSTERONE ng/ml
<input type="checkbox"/>	<input type="checkbox"/>	PROGESTERONE ng/ml
<input type="checkbox"/>	<input type="checkbox"/>	ESTROGENS pg/ml

Restraint

Purpose

<input type="checkbox"/>	1. screening
<input type="checkbox"/>	2. move
<input type="checkbox"/>	3. trauma
<input type="checkbox"/>	4. disease

Animal Condition

<input type="checkbox"/>	1. fed
<input type="checkbox"/>	2. fasting
<input type="checkbox"/>	3. starving

<input type="checkbox"/>	1. calm
<input type="checkbox"/>	2. active
<input type="checkbox"/>	3. excited

Serum Condition

<input type="checkbox"/>	1. fresh
<input type="checkbox"/>	2. frozen
<input type="checkbox"/>	3. deteriorated

Serum Appearance

<input type="checkbox"/>	1. clear
<input type="checkbox"/>	2. hemolysis
<input type="checkbox"/>	3. lipemic
<input type="checkbox"/>	4. icteric

Comments

Institution

Recorded By

Date

ZB110

<input type="checkbox"/>	Methods (Hematology)
<input type="checkbox"/>	Methods (Chemistry)

No 410



Minnesota Zoological Garden
Wentworth Office Center
33 East Wentworth Avenue
West Saint Paul, Minnesota 55118
Telephone (612) 227-9216

September 4, 1975

Dear ISIS Participants:

This letter summarizes both resolved and pending needs and problems which have been brought to our attention by various participants during the past nine months. We will use these comments as a starting point for discussions during the Computer Data Committee meeting in Calgary. Since the system is user generated and user oriented, it is exceedingly important that thoughts be shared in order to provide the maximum usefulness of the system within the scope of available budgets. We would appreciate it if your response to these specific comments and any other ideas would be prepared in writing so they can be carefully reviewed by the AAZPA Computer Data Committee. All communications received by ISIS are distributed to the committee.

Taxonomy - During the initiation of this system, the problem of mammalian taxonomy was approached with some trepidation. There was no question but that a completely current and up to date taxonomy from the point of view of the scientific literature would be difficult to achieve, especially since controversial areas cannot readily be reflected in a taxonomic dictionary required for purposes of data collection. Several people have offered to assist in updating and revising the taxonomic directory. In view of the limitations of both time and budget the decision was made to delay any further revisions of substance until a larger experience had been achieved with as wide a range of users as possible. Our experience has been that virtually all users could accommodate their needs with the currently available directory. However, the original Taxonomic Directory did contain areas which required immediate revision or attention. (1) The elephants required designation of subspecies. This has been accomplished, and a revision sent out to all users in January 1975. (2) Codes for domestic animals were deemed necessary by many users and these have been provided. (3) Special attention is being given to the lemurs and several genera of South American monkeys.

Specimen I.D. - When we began the program, we knew that from the point of view of computer utilization it would be best for all I.D. numbers to contain only numbers and not contain any alphabetic characters. However, a number of zoos had established systems containing letters and were hesitant to make a change simply for participation in ISIS. During the course of our exploration of ways to use ISIS records for development of life history information, it again became apparent that the mixed letter/number systems were not the most efficient or most effective way for us to make use of this data. Thus, we

have requested of all new users that they please use only a numeric system if at all possible. This may have caused problems for some of you for which we apologize. It appears unlikely that we can persuade all users to convert to a straightforward numeric system. Hence, we are faced with the need to write a special program to treat all of the specimen I.D. numbers in a way as to provide a unique number which will be retained only in the ISIS computer file identifying a particular animal uniquely in a given institution. This number then will be the handle used for computer tracing of genealogies and calculation of inbreeding coefficients and similar such data. Therefore, we do not plan to spend additional time attempting to convince people with letters in their code number to make the change. Again, we would apologize for any problems or difficulties but please understand that we are making every effort to make the system maximally useful and maintain costs of the system at an absolute minimum. What may appear to be arbitrary is simply an effort to achieve these goals.

Vendor/Recipient I.D. Number - We have requested of all users that they obtain from the person to whom they sell, give or loan, or from whom they buy or receive an animal, the Specimen I.D. number assigned to that animal by the receiving (or sending) party and that this number be included on the data form submitted to ISIS. This has caused considerable complaint so we would like to explain as carefully as possible our reasons for this request.

As we see the future of the ISIS records, one of the major uses may be the tracing of an animal throughout its life to produce family trees for use in zoo breeding programs. The analysis of family trees requires movement in both directions on that tree (up and down). To do this using the computer requires a link connecting that animal when two or more parties hold the animal during its lifetime. This is only achieved through use of the specimen I.D. numbers from each institution to trace the animal's movement from one institution to another. While it is indeed correct that the computer could supply the number in the seller's record (transaction code type B - removal records), we must also remember the budget constraints under which ISIS must function. At the current time, the development of such a computer program for ISIS cannot be accomplished, making your cooperation necessary in the collection of the most complete records possible.

Death Codes - The death codes currently in use were those proposed by a zoo which had been using them for several years. They were reviewed prior to their final acceptance by a dozen zoo people, including a number of veterinarians, with revisions made according to their suggestions. However, with further experience a number of people have objected either to the terminology used or to its adequacy for describing the situations encountered. This area of death codes has been one of the most strongly discussed of all parts of the data form and its usage. Therefore, we requested an additional group of zoo curators and veterinarians to generate a more satisfactory code. A substitute code has been proposed and has been reviewed by a number of other curators and veterinarians. A copy of this is enclosed and we would strongly request that you review it carefully and comment in writing to us your feelings about this code.

Careful attention must be given to the question of whether or not the death code should be used at all or replaced by the autopsy diagnoses. We can now state, on the basis of experience gathered during the past thirteen months

and some 22,000 data forms submitted, that approximately 50% of animals dying in zoos do not receive autopsies. This means then that no death data at all would be available on these deaths if we depended solely on an autopsy code. This would appear to be an unsatisfactory choice which would result in the loss of much information. We fully appreciate that more complete autopsy information is also highly desirable for inclusion in an information bank. We therefore tentatively suggest that it may be best to develop an additional data form to deal exclusively with death and autopsy data, perhaps along the lines of the FAO system currently managed by Doctor Appleby of London. We have discussed these possibilities with him and would welcome your suggestions towards our developing such a data form for the ISIS system. In the meantime, we feel that it is desirable on the basis of comments received from many zoos that some form of death code be retained and some form of death data be collected.

Certainly the death statistics obtained from the first national inventory are very impressive and, we feel, represent a very strong support for the basic contention of zoos in this country that their management performance overall has been outstanding. The information will be of value not only to support this performance record but also will be an extremely valuable contribution to our knowledge of these species in captivity.

Studbooks - We have received studbook information on leopards from Alan Shoemaker, on golden marmosets from Devra Kleiman, on Arabian oryx from Phoenix, Los Angeles, and San Diego, and have collected information on Przewalski's horse from published material. The Minnesota Zoological Garden has provided limited funds for developing prototype genealogy programs and determining precisely what we can do with this kind of information in the framework of the currently available computer program. (Plan to attend the presentation on breeding strategies by Nathan Flesness at the Calgary convention.) It will also serve as a part of the data base for developing uses of the history data bank file which has been constructed but for which no programs for utilization have been written. As we currently see it the living members of each studbook can be printed out separately on some recurring basis. Those animals which died in past years will not appear on the current printouts. This information will be in the history data file. The further development of such a program is dependent upon additional funds.

Demand Reports - We now have the experience needed to estimate the cost to a participating institution for an updated zoo inventory report, acquisition-release report, and/or national species report on a monthly, quarterly, or semi-annual basis. An individual zoo inventory report and acquisition-release report on fiche and paper can be obtained monthly, quarterly, or semi-annually through a written request to ISIS and a fee payment of \$15 per combined inventory and A-R report. An updated National Species Report on microfiche can be obtained quarterly or semi-annually through a written request to ISIS and fee payment of \$20.00 to cover our costs and handling.

ISIS Committee Meeting and Status Report at Calgary - There will be an open meeting of the AAZPA Computer Data Committee to discuss ISIS on Sunday, September 14th at 2 P.M. in the Colonial Room of the Palliser Hotel in Calgary. All are encouraged to attend.

On Wednesday morning, September 17th, Dr. Lee Simmons and Dr. Ulie Seal will present an ISIS status report to the convention.

Life History and Physiological Norms Trial Runs - Nine hundred trial run forms for the new Life History ISIS subsystem were mailed out in July to twenty-six zoos. To date, one hundred and nineteen completed forms have been returned to ISIS, with comments, from nine of the participants.

Six hundred and twenty-five trial run forms for the Physiological Norms subsystem were also mailed out in July to twenty-five zoos. One hundred and thirty-six completed forms have been returned from eight of the participating zoos.

Enclosures

Proposed Annual Operating Costs for ISIS

Alterations Requested by ISIS Participants and the Accomplished Results

Proposed Death Code Revisions

Statistical Analyses of Exotic Animals on Exhibit in North American Zoos
Obtained From the First ISIS National Species Report Covering 1974

An Analysis of the Jaguar Breeding Population in Zoos as Recorded in the
First ISIS National Species Report

Sincerely,

Lee Simmons, D.V.M.
Co-Chairman, AAZPA Computer Data Committee

U.S. Seal, Ph.D
Co-Chairman, AAZPA Computer Data Committee

Dale G. Makey
ISIS Co-Developer and Systems Analyst

Linda E. Murtfeldt
ISIS System Manager

INTERNATIONAL SPECIES INVENTORY SYSTEM

Proposed Annual Operating Costs

Keypuncher/Typist	\$ 9,100
Data Assembly, Printouts & Computer Time	6,000
Printing for Distribution of Inventories and Tabulations	5,000
Printing of Forms, Cards, Correspondence	1,500
Tapes & Discs	700
Telephone & Mailing Costs	2,000
Travel	2,500
Systems Analysis & Programming	1,500
Keypunch Rental	2,360
Office Supplies	300
Equipment	500
Memberships & Subscriptions	100
	<hr/>
	\$31,560

ALTERATIONS REQUESTED BY ISIS PARTICIPANTS
AND THE ACCOMPLISHED RESULTS

1. Addition of subspecies for the elephants.
2. Addition of taxonomic code numbers and scientific names for domestic animals.
3. Addition of space for known birth dates.
4. Addition of space for recording captive, wildborn, or unknown origin.
5. Addition of space for recording location of capture or birth.
6. Additions of all requested institution codes.
7. Proposed change to death codes.
8. Indication of age estimates on computer print-outs.
9. Printing of "New Inventory Data" forms on heavy paper, using carbonless paper, and orienting in a horizontal fashion for easier filing by zoos.
10. Reorganization of header information on data forms.
11. Addition of specimen ID numbers for specimens not individually identified, eg. "UNK 1", "UNK 2".
12. Addition of space for "color phase"
13. Development of a Life History format.

TENTATIVE CAUSE OF DEATH CODES

- A. Euthanized
- B. Self - inflicted injuries
- C. Injury from exhibit - mate
- D. Injury from predator
- E. Malicious destruction
- F. Starvation due to environmental or behavioral conditions
- G. Hyperthermia due to environmental or behavioral conditions
- H. Hypothermia due to environmental or behavioral conditions
- I. Died in transit
- J. Abnormal birth (stillborn, premature)
- K. Anesthetic or restraint death
- L. Non - anesthetic drug overdose
- M. Other cause
- N. Unknown

ISIS ZOO INVENTORY ANALYSIS

Table 1A

SUMMARY BY MAMMALIAN ORDERS

1974

	<u>Specimens</u>	<u>Births</u>	<u>Recorded Deaths</u>	<u>Estimated Deaths</u>	<u>Sum of Aquisitions</u>	<u>Sum of Releases</u>	<u>Autopsies</u>
Monotremata	16	0	1		2	1	0
Marsupialia	417	73	12	(48)	170	16	6
Insectivora	83	16	5	(20)	30	7	1
Chiroptera	115	13	4	(16)	25	11	3
Primates	3006	277	56	(224)	617	127	42
Edentata	188	4	1	(4)	36	4	0
Dermoptera	0						
Pholidata	3	0	0	-	0	0	0
Lagomorpha	16	8	0	-	11	0	0
Rodentia	754	132	27	(108)	352	33	13
Cetacea	2	0	0	-	0	0	0
Carnivora	2888	478	48	(192)	934	203	25
Pinnipedia	142	1	4	(16)	29	5	3
Tubulidentata	5	0	0	-	3	0	0
Proboscidea	107	0	1	(4)	15	1	1
Hyracoidea	71	11	3	(12)	27	3	3
Sirenia	0						
Perissodactyla	432	31	5	(20)	76	25	1
Artiodactyla	3841	900	119	(476)	1190	323	55
	<u>12086</u>	<u>1944</u>	<u>286</u>	<u>(1144)</u>		<u>759</u>	<u>153</u>

ISIS ZOO INVENTORY ANALYSIS

Table 1B

SUMMARY BY MAMMALIAN ORDERS

1974

	<u>% of Mammals</u>	<u>Births as % of Sum</u>	<u>Births as % Aquis.</u>	<u>Deaths as % Sum</u>	<u>Ratio of Births/Deaths</u>
Monotremata	1 ³	0	0	-	-
Marsupialia	3.5	17.5	42.9	11.5	1.52
Insectivora	.7	19.3	53.3	24.1	.8
Chiroptera	1.0	11.3	52.0	13.9	.81
Primates	24.9	9.2	44.9	7.5	1.23
Edentata	1.6	2.1	11.1	2.1	1.00
Dermoptera					
Pholidata	.02	0	0	-	-
Lagomorpha	1 ³	50	72.7	-	-
Rodentia	6.2	17.5	37.5	14.3	1.22
Cetacea	-	0	0	-	-
Carnivora	23.9	16.5	51.2	6.6	2.50
Pinnipedia	1.2	.7	3.4	11.3	.06
Tubulidentata	.04	0	0	-	-
Proboscidea	0.9	0	0	3.7	0
Hyracoidea	0.6	15.5	40.7	16.9	.92
Sirenia					
Perissodactyla	3.6	7.2	40.8	4.6	1.57
Artiodactyla	31.8	23.4	75.6	12.4	1.89

ISIS ZOO INVENTORY ANALYSIS

Table 2A

SUMMARY OF PRIMATE FAMILIES

1974

	<u>Specimens</u>	<u>Births</u>	<u>Recorded Deaths</u>	<u>Estimated Deaths</u>	<u>Sum of Aquisitions</u>	<u>Sum of Releases</u>	<u>Autopsies</u>
Lemuridae	334	55	2	(8)	62	4	2
Indridae	7	2	0	(0)	2	0	0
Daubentoniidae	3	1	0	(0)	1	0	0
Lorisidae	204	21	3	(12)	51	8	0
Tarsiidae	5	0	0	(0)	2	0	0
Cebidae	644	37	10	(40)	154	14	10
Callithrichidae	192	47	8	(32)	72	13	6
Cercopithecidae	1119	93	24	(96)	195	65	19
Pongidae	493	21	9	(36)	78	23	5
Hominidae	5	-	-	-	-	-	-
	<u>3006</u>	<u>277</u>	<u>56</u>	<u>(224)</u>	<u>617</u>	<u>127</u>	<u>42</u>

ISIS ZOO INVENTORY ANALYSIS

Table 2B

SUMMARY OF PRIMATE FAMILIES

1974

	<u>% of Mammals</u>	<u>Births as % of Sum</u>	<u>Births as % Aquis.</u>	<u>Deaths as % Sum</u>	<u>Ratio of Births/Deaths</u>
Lemuridae	11.1	16.5	88.7	2.4	6.88
Indridae	0.2	28.6	100.0	0	0
Daubentoniidae	0.1	33.3	100.0	0	0
Lorisidae	6.8	10.3	41.2	5.9	1.75
Tarsiidae	0.2	0	0	0	0
Cebidae	21.4	5.7	24.0	6.2	.93
Callithrichidae	6.4	24.5	65.3	16.7	1.47
Cercopithecidae	37.2	8.3	47.7	8.6	.97
Pongidae	16.4	4.3	26.9	7.3	.58
Hominidae	0.2	-	-	-	-

ISIS ZOO INVENTORY ANALYSIS

Table 3A

SUMMARY OF CARNIVORE FAMILIES

1974

	<u>Specimens</u>	<u>Births</u>	<u>Recorded Deaths</u>	<u>Estimated Deaths</u>	<u>Sum of Aquisitions</u>	<u>Sum of Releases</u>	<u>Autopsies</u>
Canidae	299	47	3	(12)	95	22	1
Ursidae	395	27	9	(36)	72	26	6
Procyonidae	230	14	1	(4)	65	9	1
Mustelidae	257	8	5	(20)	94	12	3
Viverridae	117	7	2	(8)	38	5	0
Hyaenidae	44	6	1	(4)	9	2	0
Felidae	1546	369	27	(108)	561	127	14
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	2888	478	48	(192)	934	203	25

ISIS ZOO INVENTORY ANALYSIS

Table 3B

SUMMARY OF CARNIVORE FAMILIES

1974

	<u>Mammals</u>	<u>Births as % of Sum</u>	<u>Births as % Aquis.</u>	<u>Deaths as % Sum</u>	<u>Ratio of Births/Deaths</u>
Canidae	10.4	15.7	49.5	4.0	3.92
Ursidae	13.7	6.8	37.5	9.1	.75
Procyonidae	8.0	6.1	21.5	1.7	3.5
Mustelidae	8.9	3.1	8.5	7.8	.4
Viverridae	4.1	6.0	18.4	6.8	.88
Hyaenidae	1.5	13.6	66.7	9.1	1.5
Felidae	53.5	23.9	65.8	7.0	3.42

ISIS ZOO INVENTORY ANALYSIS

Table 4A

SUMMARY OF ARTIODACTYLA FAMILIES

1974

	<u>Specimens</u>	<u>Births</u>	<u>Recorded Deaths</u>	<u>Estimated Deaths</u>	<u>Sum of Aquisitions</u>	<u>Sum of Releases</u>	<u>Autopsies</u>
Suidae	11	4	0	(0)	4	0	0
Tayassuidae	44	10	1	(4)	11	3	0
Hippopotamidae	89	13	1	(4)	16	4	0
Camelidae	324	55	5	(20)	85	19	5
Tragulidae	3	-	-	-	-	-	-
Cervidae	1043	257	43	(172)	306	103	16
Giraffidae	105	15	2	(8)	29	3	2
Antilocapridae	37	10	5	(20)	19	6	4
Bovidae	2185	536	62	(248)	720	185	28
	<u>3841</u>	<u>900</u>	<u>119</u>	<u>(476)</u>	<u>1190</u>	<u>323</u>	<u>55</u>

ISIS ZOO INVENTORY ANALYSIS

Table 4B

SUMMARY OF ARTIODACTYLA FAMILIES

1974

	<u>Mammals</u>	<u>Births as % of Sum</u>	<u>Births as % Aquis.</u>	<u>Deaths as % Sum</u>	<u>Ratio of Births/Deaths</u>
Suidae	.3	36.4	100	0	0
Tayassuidae	1.1	22.7	90.9	9.1	.1
Hippopotamidae	2.3	14.6	81.3	4.5	3.3
Camelidae	8.4	17.0	64.7	6.2	2.8
Tragulidae	.1	-	-	-	-
Cervidae	27.2	24.6	84.0	16.5	1.5
Giraffidae	2.7	14.3	51.7	7.6	1.9
Antilocapridae	1.0	27.0	52.6	54.1	.5
Bovidae	56.9	24.5	74.4	11.4	2.2

PRELIMINARY ANALYSIS OF THE
ISIS NATIONAL INVENTORY AND ACQUISITION REPORT - 5/30/75

The first International Species Inventory System mammalian species distribution summary (our first national survey) was prepared May 5, 1975. It records data on 12,156 living specimens based on reports from 92 zoos, of whom 44 have completed their entire inventory reports. The report summarizes events occurring during the year 1974, thus, any births or deaths occurring during 1975 are not included. The report contains data on 12,156 living specimens of mammals, of which 1,944 were born in 1974, and 287 deaths were recorded. The 287 deaths represent only a proportion of the deaths occurring in 1974 since we did not begin collecting data until June 1974. Our instructions to the zoos requested they begin with their currently living collection and then report deaths and other changes as they occurred from their beginning date. This means that all animals born in 1974 and still living in the zoo would be recorded, whereas only about 1/4th of the year's deaths are on record. We, therefore, estimate that the actual number of deaths is around 1,144. More accurate data will be available at the end of 1975. Thus, 16% of the 12,156 living specimens on record were born during 1974, and 9% of a total 13,300 died during 1974. The total number of acquisitions during this period was 3,517 and includes 1,944 births, 784 purchases, 165 trades, 414 donations, and 155 loans. During the same period 760 specimens were released or removed from the individual collections. This included the 287 deaths mentioned above and 249 sales, 74 trades and 88 loans. At the time of reporting, 157 autopsies were recorded for the 287 deaths, yielding an autopsy rate of 55%. This rate would increase with later autopsy reports as these became available, but even at this percentage is higher than the nation - wide rate of human autopsies. Although it will be another six months before complete data are available to allow precise estimates of overall birth rates and death rates, it is already clear that the number of animals being born in zoo collections considerably exceeds the current death rate. This is the result of many successful breeding programs which are producing sufficient numbers of some species such that no additional space is available in qualified zoo collections for these animals. It also reflects the fact that the death rate for many species in captivity is considerably lower than that observed in the wild since zoo collections offer continuous adequate nutrition, treatment for disease and no predator pressure. Rather, a major consideration for future zoo breeding management policy will be carefully regulated breeding to maintain adequate genetic heterogeneity in the gene pools to be maintained in captivity primarily from captive stock. The

data base provided by the ISIS program of the AAZPA will make a significant contribution to the achievement of these breeding policy objectives. An example of the kind of information available to the zoos may be illustrated with our available data on an endangered species, the jaguar, Panthera onca. This species is currently considered to contain eight subspecies of which three are currently identified as being held in captivity. The following data are the actual numbers based upon the animals reported, that is 12,156. It is estimated that this represents one-third of the animals held in collections in North America. Since the sample size is so large and there are a wide spread of zoo exhibitors represented, we feel that a reasonable estimate of the actual numbers in each of the categories to be discussed can be obtained simply by multiplying by three. Thus, the total number of jaguars listed are 125, of which 111 are unidentified with respect to subspecies classification, and 24 are placed in either Panthera onca centralis or Panthera onca onca, or Panthera onca arizonensis. These 125 animals are held in 42 zoos. The sexes are as follows: 66 females, 58 males, and 1 of unknown sex. Eleven of the zoos held animals of one sex only, for a total of 13, yielding 31 zoos with 114 animals in a potentially paired situation. During the time of record, 35 baby jaguars were born and 30 currently remain in these collections. There appear then to have been 13 litters born in 12 zoos, with two deaths occurring during the first 60 days. Thus, the 114 animals minus 30 born during the year yields 84 animals that might potentially be breeders. However, an additional 13 are less than two years old, yielding 71 animals of approximately breeding age. A survey of the data indicated 30 zoos with pairs of animals older than two years that might potentially produce young. Twenty-three of these zoos had pairs between the age of two and ten years, which produced a total of nine litters in eight of the zoos. Seven of the zoos had pairs greater than 10 years of age, which produced three litters. Thus, eleven out of 30 zoos produced a total of 12 litters for a total of 34 animals born. If one multiplies these numbers by three to arrive at an estimate of the total captive jaguar population in North America, the data indicate the presence of 375 animals and the probability that about 105 births occurred during the year of 1974. The effective breeding population would be in the vicinity of 210 animals, with adequate recruitment to maintain this population and produce a surplus. Consideration will need to be given to the age structure of this effective breeding population in order to insure that its composition will allow a long-term stability of the population and also assure the management of breeding in such a manner as to avoid substantial

inbreeding and loss of genetic heterogeneity. This analysis of the ISIS data would indicate that these goals are easily obtainable given the development of explicit breeding management strategies, given the ability to exchange animals readily between qualified zoos, and given the continued development of this data base. The enthusiasm and cooperation of the North American zoos in developing this program represents a unique achievement in man's relationships to captive animals and ultimately to the benefit of these species in the wild. The accomplishment of these goals is clearly within the grasp of the zoos and has been accomplished by sustained cooperative effort between the zoos, private foundations, and several government agencies. It clearly signified the interest of all groups in the welfare of the species and the effort to make a significant contribution towards their ultimate continued survival in natural habitats.

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A.A.Z.P.A.

mammals
complete +
updated
no #

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P. O. Box 1562
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mammals
complete
but not updated
no #

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2 batches of
mammal forms
sent in - last
sent in Feb. 75;
won't continue
till animals
moved to new
location
no #

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mammals
complete
no forms sent in
since Nov. '74
no #

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mammals
complete
& updated,
birds begun
no #

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mammals
complete
but not updated
no #

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signed up to
participate
nothing more
no #

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mammals
complete
paid
no forms since 11-74

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mammals
complete +
updated;
no #
birds begun

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mammals
complete +
updated
no #

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mammals begun
but incomplete
paid

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