Global Strategic Planning for Felids
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Introduction: Reduction and fragmentation of wildlife populations and habitat are occurring at a rapid and accelerating rate. For an increasing number of taxa, the results are small and isolated populations at risk of extinction. A rapidly expanding human population, now estimated at 5.25 billion, is expected to increase to 8 billion by the year 2025. This expansion and concomitant utilization of resources has momentum that cannot be stopped, the result being a decreased capacity for all other species to simultaneously exist on the planet.

As wildlife populations diminish in their natural habitat, wildlife managers realize that management strategies must be adopted that will reduce the risk of extinction. These strategies will be global in nature and will include habitat preservation, intensified information gathering and, in some cases, scientifically-managed captive populations that can interact genetically and demographically with wild populations.

Successful preservation of wild species and ecosystems necessitates developing and implementing of active management programs by people and governments living within the range area of the species in question. The recommendations contained here are based on conservation need only; adjustments for political and other constraints are the responsibility of regional governmental agencies charged with the preservation of flora and fauna within their respective countries.

Conservation Assessment and Management Plans (CAMPs): Within the Species Survival Commission (SSC) of IUCN-The World Conservation Union, the primary goal of the Captive Breeding Specialist Group (CBSG) is to contribute to developing of holistic and viable conservation strategies and management action plans. Toward this goal, CBSG is collaborating with agencies and other Specialist Groups worldwide to develop scientifically-based processes, on both a global and regional basis, with the goal of facilitating an integrated approach to species management for conservation. One of these tools is called a Conservation Assessment and Management Plan (CAMP).

CAMPs provide strategic guidance for applying intensive management techniques that are increasingly required for survival and recovery of threatened taxa. CAMPs also are one means of testing the applicability of the Mace-Lande criteria for threat as well as the scope of its applicability. Additionally, CAMPs produce ongoing summaries of current data for groups of taxa, providing a mechanism for recording and tracking of species status.

In addition to managing in the natural habitat, conservation programs leading to viable populations of threatened species may sometimes need a captive component. In general, captive populations and programs can serve several roles in holistic conservation: 1) as genetic and demographic reservoirs that can be used to reinforce wild populations whether by revitalizing populations that are languishing in natural habitats or by re-establishing by translocating populations that have become depleted or extinct; 2) by providing scientific resources for information and technology that can be used to protect and manage wild populations; and 3) as living ambassadors that can educate the public as well as generate funds for *in situ* conservation.

It is proposed that, when captive populations can assist species conservation, captive and wild populations should, and can be, intensively and interactively managed with interchanges of animals occurring as needed and as feasible. Captive populations should be a support, not a substitute for wild populations. There may be problems with interchange

between captive and wild populations with regard to disease, logistics and financial limitations. In the face of the immense extinction crisis facing many taxa, these issues must be addressed and resolved immediately.

The CAMP process. The CAMP process assembles expertise on wild and captive management for the taxonomic group under review in an intensive and interactive workshop format. The purpose of this Felid CAMP reassessment was to assist in further developing a global conservation strategy for all felids, and to continue to test the applicability of the Mace-Lande criteria. On 18-20 March, 1994, 54 individuals met in Front Royal, Virginia to review, refine and develop further conservation strategies for the Felidae family.

Participants worked together to: 1) determine best estimates of the status of all species/subspecies in the family Felidae; 2) reevaluate each taxon according to Mace-Lande categories of threat; and 3) identify areas of action and information needed for conservation and management purposes. Assessments and recommendations of the working group were circulated to the entire group prior to final consensus, as represented in this document. Summary recommendations concerning research management, assignment of all taxa to threatened status and captive breeding were supported by the workshop participants.

CAMP workshop goals. The goals of the Felid CAMP workshop were:

1. To review the population status and demographic trends for Felidae, to reevaluate the applicability of the Mace-Lande criteria for threat and to discuss management options for various felid taxa.

2. To provide recommendations for *in situ* and *ex situ* management, research and information-gathering for all felid taxa, including: recommendations for PHVA workshops; more intensive management in the wild; taxonomic research, survey, monitoring, investigation of limiting factors, taxonomy or other specific research.

3. Produce an updated CAMP document for Felidae, presenting the recommendations from the workshop, for distribution to and review by workshop participants and all parties world wide interested in felid conservation.

Assignment to Mace-Lande categories of threat. All Felidae taxa were evaluated on a taxon-by-taxon basis in terms of current and projected status in the wild to assign priorities for conservation action or information-gathering. Workshop participants applied the criteria proposed for the redefinition of the IUCN Red Data Categories proposed by Mace and Lande (G. M. Mace and R. Lande, 1991, Conservation Biology 5:2, pp.148-157). The Mace-Lande scheme assesses threat in terms of a likelihood of extinction within a specified period of time (Table 1). The system defines three categories for threatened taxa:

Critical 50% probability of extinction within 5 years or two generations, whichever is longer.

Endangered 20% probability of extinction within 20 years or 10 generations, whichever is longer.

Vulnerable 10% probability of extinction within 100 years.

Definitions of these criteria are based on population viability theory. To assist in making recommendations, participants in the workshop were encouraged to be as quantitative or numerate as possible for two reasons: 1) CAMPs ultimately must establish numerical objectives for viable population sizes and distributions; 2) numbers provide for more objectivity, less ambiguity, more comparability, better communication and, hence, cooperation. During the workshop, there were many attempts to estimate if the total population of each taxon was greater or less than the numerical thresholds for the three Mace-Lande categories of threat. In many cases, current population estimates for felid taxa were unavailable or available for species/subspecies within a limited part of their distribution. In all cases, conservative numerical estimates were used. **When population numbers were estimated, these estimates represented first-attempt, order-of-magnitude educated guesses that were hypotheses for falsification. As such, the workshop participants emphasized that these estimates should not be authoritative for any other purpose than was intended by this process.**

Table 1. MACE-LANDE CATEGORIES AND CRITERIA FOR THREAT

POPULATION TRAIT	CRITICAL	ENDANGERED	VULNERABLE
Probability of extinction	50% within 5 years or 2 generations, whichever is longer	20% within 20 years or 10 generations, whichever is longer	10% within 100 years
	OR	**OR**	**OR**
	Any 2 of the following criteria:	Any 2 of following criteria or any 1 CRITICAL criterion	Any 2 of following criteria or any 1 ENDANGERED criterion
Effective population N_e	$N_e < 50$	$N_e < 500$	$N_e < 2{,}000$
Total population N	$N < 250$	$N < 2{,}500$	$N < 10{,}000$
Subpopulations	≤ 2 with $N_e > 25$, $N > 125$ with immigration < 1/generation	≤ 5 with $N_e > 100$, $N > 500$ or ≤ 2 with $N_e > 250$, $N > 1{,}250$ with immigration < 1/gen.	≤ 5 with $N_e > 500$, $N > 2{,}500$ or ≤ 2 with $N_e > 1{,}000$, $N > 5{,}000$ with immigration < 1/gen.
Population Decline	$> 20\%$/yr. for last 2 yrs. or $> 50\%$ in last generation	$> 5\%$/yr. for last 5 years or $> 10\%$/gen. for last 2 years	$> 1\%$/yr. for last 10 years
Catastrophe: rate and effect	$> 50\%$ decline per 5-10 yrs. or 2-4 generations; subpops. highly correlated	$> 20\%$ decline/5-10 yrs, 2-4 gen $> 50\%$ decline/10-20 yrs, 5-10 gen with subpops. highly correlated	$> 10\%$ decline/5-10 yrs. $> 20\%$ decline/10-20 yrs. or $> 50\%$ decline/50 yrs. with subpops. correlated
OR			
Habitat Change	resulting in above pop. effects	resulting in above pop. effects	resulting in above pop. effects
OR			
Commercial exploitation or Interaction/introduced taxa	resulting in above pop. effects	resulting in above pop. effects	resulting in above pop. effects

In assessing threat according to Mace-Lande criteria, workshop participants also used information on the status and interaction of habitat and other characteristics (Table 1). Information about population trends, fragmentation, range and stochastic environmental events, real and potential, also were considered.

Numerical information alone was insufficient for assignment to one of the Mace-Lande categories of threat. For example, based solely on numbers, a taxon might be assigned to the 'Vulnerable' or 'Secure' category. Knowledge of the current and predicted threats or fragmentation of remaining natural habitat, however, may lead to assignment to a higher category of threat.

Mace-Lande categories of threat for the 244 taxa examined during this CAMP exercise are presented in Table 2. An additional 22 taxa were categorized as 'unknown' or extinct. Table 7 shows Mace-Lande categorization and recommendations for all felid taxa.

Table 2. Threatened Felid Taxa - Mace-Lande Categories of Threat

MACE-LANDE CATEGORY	NUMBER OF TAXA	PERCENT OF TOTAL
Critical	35	14.3
Endangered	67	27.4
Vulnerable	84	34.4
Secure	36	14.8
TOTAL	222	90.9

Regional distribution of threatened taxa is presented in Table 3.

Table 3. Regional Distribution of Threatened Felid Taxa.

	REGION				
MACE-LANDE	Africa	South & Central America	Asia	Europe	North America
Critical	4	5	18	5	5
Endangered	10	26	28	0	1
Vulnerable	21	13	13	16	14
Secure	10	1	2	3	11
TOTAL	45	45	61	24	31

Recommendations for intensive management and research actions. For all taxa, recommendations were generated for the kinds of intensive action necessary, both in terms of management and research, that were believed necessary and high priority for effective

conservation. These recommendations (summarized in Table 5) were: 1) Population and Habitat Viability Assessment (PHVA) workshops; 2) wild management and research; and 3) captive programs. PHVA workshops provide a means of assembling available, detailed biological information on the respective taxa, evaluating threats to habitat, developing of management scenarios with immediate and 100-year time-scales and formulating specific adaptive management plans with the aid of simulation models. In some cases, workshop participants determined that the current level of information for a taxa was inadequate for conducting a PHVA; in those cases, recommendations were listed as PHVA Pending.

Workshop participants attempted to develop an integrated approach to management and research actions needed for conserving felid taxa. In all cases, an attempt was made to make management and research recommendations based on the various levels of threat impinging on the taxa. For the purposes of the CAMP process, threats were defined as 'immediate or predicted events that are or may cause significant population declines'.

With only partial understanding of the underlying causes for decline in some taxa, it was sometimes difficult to clearly define specific management actions needed for conservation. Therefore, 'research management' must become a component of conservation and recovery activities. Research management can be defined as a management program that includes strong feedback between management activities and an evaluation of the efficacy of the management, as well as response of the felidae taxa to that activity. Seven basic categories of research management activities were identified: survey (e.g., search and find); monitoring;
translocation; taxonomic research or clarification; management of limiting factors; limiting factors research; and life history research. The frequent need for survey information to evaluate population status, especially for those taxa listed as Critical, emphasizes the need to quickly implement intensive survey methods. Research management recommendations are summarized in Table 4.

Table 4. Research Management Recommendations for Felids

MACE-LANDE	PHVA	PHVA PEND	SURVEY	MONITR	LIFE HISTORY RSRCH	LIMITING FACTORS RSRCH	LIMITING FACTORS MGMT	HABITAT MGMT	TAXON RSRCH	TRNS LOC
Critical	16	3	28	11	3	1	0	11	26	0
Endangered	25	2	41	12	0	0	0	29	56	0
Vulnerable	13	2	33	22	0	0	0	11	69	0
Secure	6	0	7	1	0	0	0	2	21	0
TOTAL	60	7	109	46	3	1	0	53	172	0

Captive Program Recommendations. For some felid taxa, it was determined that a captive component is necessary to contribute to maintaining long-term viable populations. It is proposed that, when captive populations can assist species conservation, captive and wild populations should be intensively and interactively managed with interchanges of animals occurring as needed and as feasible. There may be problems with interchange between captive and wild populations with regard to disease, logistics and financial limitations.

Today, as more and more species are threatened with population declines, cooperative recovery programs (including both zoos and the private sector) may provide a major avenue for survival. This cooperation must include support for field research, habitat conservation and public education.

When *ex situ* management was recommended, the 'level' of captive program also was prepared, reflecting status, prospects in the wild and taxonomic distinctiveness. The captive levels used during the Felid CAMP are defined below:

Level 1 (1) -A captive population is recommended as a component of a conservationprogram. This program has a tentative goal of developing and managing a population sufficient to preserve 90% of the genetic diversity of a population for 100 years (90%/100). The program should be further defined with a species management plan encompassing the wild and captive populations and implemented immediately with available stock in captivity. If the current stock is insufficient to meet program goals, a species management plan should be developed to specify the need for additional founder stock. If no stock is present in captivity then the program should be developed collaboratively with appropriate wildlife agencies, SSC Specialist Groups and cooperating institutions.

Level 2 (2) - Similar to the above except a species/subspecies management plan would include periodic reinforcement of captive population with new genetic material from the wild. The levels and amount of genetic exchange needed should be defined in terms of the program goals, a population model and species management plan. It is anticipated that periodic supplementation with new genetic material will allow management of a smaller captive population. The time period for implementation of a Level 2 program will depend on recommendations made at the CAMP workshop.

Level 3 (3) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies but is recommended for education, research or husbandry.

Other captive recommendations include:

No (N) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies. Taxa already held in captivity may be included in this category. In this case, species/subspecies should be evaluated either for management toward a decrease in numbers or for complete elimination from captive programs as part of a strategy to accommodate as many species/subspecies as possible of higher conservation priority as identified in the CAMP or in an SSC Action Plan.

Pending (P) - A decision on a captive program will depend upon further data either from a PHVA, a survey or existing identified sources to be queried.

During the CAMP workshop, all felid taxa were reevaluated relative to their current need for captive propagation. Recommendations were based upon immediate need for conservation (population size, Mace-Lande status, population trend, type of captive

propagation program), need for or suitability as a surrogate species, current captive populations and determination of 'difficulty' (as stated above). Based on all the above considerations, in addition to threats, trends and Mace-Lande assessment, recommendations for captive programs were made. These recommendations, by category of threat, are presented in Table 5. Recommendations for levels of programs and information concerning the current populations of various Felidae species/subspecies in captivity (according to the International Species Information System) are presented in Table 6.

Table 5. Captive Program Recommendations for Felids by Mace-Lande Threat Category

MACE-LANDE	Level 1	Level 2	Pending	No
Critical	17	2	3	10
Endangered	29	24	0	9
Vulnerable	3	25	0	12
Secure	0	4	0	26
TOTAL	49	55	3	57

Table 6.

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR FELIDS
16-18 MARCH 1994

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
1	Felis	aurata (Profelis)	West Africa						?		NO		1		LEV 2
2	Felis (Profelis)	aurata aurata (=cottoni)	Uganada, Congo, Kenya	100,000?	4	YES	D		V	L	NO	T,S,H	2		
3	Felis	aurata celidogaster	West Africa	50,000?	4	YES	D		V	L	NO	T,S,H	2		
4	Felis (Pardofelis)	badia	Borneo	<50?	5	YES	D		C	L	P	T,S	0		P
5	Felis (Prionailurus)	bengalensis	Asia	1,000,000	4	YES	D		S	H,I,L	NO	T,S,H, M	35		LEV 2
6	Felis	bengalensis bengalensis				YES	D		E		NO	T,S,H	10		LEV 2
7	Felis	bengalensis borneoensis (Island)	Borneo												
8	Felis	bengalensis chinensis	India, S.E. Asia						?		NO	S,T			LEV 2
9	Felis	bengalensis euptilura	India, S.E. Asia						?		NO	S,T	58		LEV 2
10	Felis	bengalensis horsfieldi	India, S.E. Asia						?		NO	S,T			LEV 2
11	Felis	bengalensis javanensis	Java, Bali				D		V		NO	T,S,H, M	0		LEV 2

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
12	Felis	bengalensis manchurica	India, S.E. Asia						?			S,T			LEV 2
13	Felis	bengalensis minutus	Philippines				D		V		NO	T,S,H, M	0		LEV2
14	Felis	bengalensis sumatranus	Sumatra, Nias				D		V		NO	T,S,H, M	0		LEV 2
15	Felis	bengalensis travallani	India,S.E. Asia						?		NO	S,T			LEV 2
16	Felis	bieti (also bieti bieti)	W. Central China	>10,000	5	FRG	?		E	H,I	NO	T,S	3		LEV 1
17	Felis	bieti chutuchta		?			D		E						
18	Felis	bieti vellerosa		?			D		E						
19	Felis	chaus		>100,000	5	FRG	?		V	I,Hyb	NO	T,S	38	1	LEV 2
20	Felis	chaus affinis	Europe,Africa,A sia												
21	Felis	chaus chaus													
22	Felis	chaus fulvidina													
23	Felis	chaus furax													
24	Felis	chaus kelaarti													
25	Felis	chaus kutas													

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
26	Felis	chaus nilotica													
27	Felis	chaus oxiana											0		
28	Felis	chaus prateri											5		
29	Felis	chaus valbalala	Sri Lanka	<10,000	5	YES	?		V	Hyb, I,H	NO	T,S	0		LEV 2
30	Felis (Lynchailurus)	colocolo (Pampas)	Peru, Ecuador & southward	>10,000	3	YES	D	G	E?	L,Lf,I	NO	T,S,M	30	2	LEV 2
31	Felis	colocolo budini													
32	Felis	colocolo colocolo													
33	Felis	colocolo crespoi													
34	Felis	colocolo garleppi (Mtn Pop)	Peru, Chile, Ecuador	<2,000	4	YES	?	F	E	I,Lf,L	YES	T,S,H	<5	2	LEV 1-2
35	Felis	colocolo pajeros													
36	Felis	colocolo thomasi													
37	Felis	concolor	N. America						?	L		T,M	234	1	No
38	Felis	concolor acrocodia	Ecuador/Brazil	?		YES	?		E	L	NO	T	~5	1	LEV 2
39	Felis	concolor anthonyi	S. Venezuela	?		YES	?		E	L	NO	T	~5	1	LEV 2

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
40	Felis	concolor aruacanus	C. Chile						E	L		T	~5	1	LEV 2
41	Felis	concolor azteca	N. America	>250	4	?	S	AA	V	L	NO	T,M	5	1	LEV 2
42	Felis	concolor bangsi	N Columbia Venezuela	?		YES	?		E	L	NO	T	~5	1	LEV 2
43	Felis	concolor borbensis	C Brazil	?		YES	?		E	L	NO	T	~5	1	LEV 2
44	Felis	concolor browni	Arizona	250	4	NO	?	AA-1	V	I,L	NO	T,M	0	1	LEV 2
45	Felis	concolor cabrera	N Argentina	?		YES	?		E	L	NO	T	~30	1	LEV 2
46	Felis	concolor californica	N. America	5,000 - 10,000	4	YES	?	F	V/S	I,L	NO	T,M	0	1	LEV 2
47	Felis	concolor capricornensis	S.Brazil	?		YES	?		E	L	NO	T	~30	1	LEV 2
48	Felis	concolor concolor	Venezuala Fr. Guyana	?		YES			E	L	NO	T	35	1	LEV 2
49	Felis	concolor coryi	N. America (S. Florida)	50	1	YES	D	AA-1	C	Pu,I,G	YES	M,H	11	2	LEV 1
50	Felis	concolor costraricensis	Mexico, C. America	500	4	YES	D		V	L,I,H Hf	YES	T,S,M	~30	1	N
51	Felis	concolor cougar	N. America	E?	4	YES	E		V		NO	T,M	0		LEV 2
52	Felis	concolor greeni	E. Brazil	?		YES	?		E	L	NO	T	~10		LEV 2
53	Felis	concolor hippolestes	Wyoming,Utah, Montana	1,000 - 2,500	4	?	S		V		NO	T,M	14		LEV 2

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
54	Felis	concolor improcera	Baja Peninsula	?		?	?	AA-1	V	L	NO	T,M	1	1	LEV 2
55	Felis	concolor incarum	Peru	?		YES	?		E	L	NO	T	~5		LEV 2
56	Felis	concolor kaibabensis	N. Arizona S. Utah	>5,000	4	?	S	E	V		NO	T,M	3		LEV 2
57	Felis	concolor mayensis	Mexico, C. America	1000	4	YES	D		V	L,I,H Hf	YES	T,S,M	50		N
58	Felis	concolor missoulensis	Alberta, Montana	>10,000	4	?	S	G	V/S		NO	T,M	8		LEV 2
59	Felis	concolor oregonensis	Washington Oregon British Columbia	>10,000	4	?	S	G	V/S		NO	T,S	6		LEV 2
60	Felis	concolor osgoodi	Bolivia	?		YES	?		E	L	NO	T	~5		LEV 2
61	Felis	concolor patagonica	S.Chile	?		YES	?		E	L	NO	T	~3		LEV 2
62	Felis	concolor pearsoni	S. Argentina	?		YES	?		E	L	NO	T	~10		LEV 2
63	Felis	concolor puma	N.Chile Argentina	?		YES	?		E	L	NO	T	~20		LEV 2
64	Felis	concolor schorgeri	N. America	?		?	?		Ext		NO				
65	Felis	concolor soderstromii	Columbia Ecuador	?		YES	?		E	L	NO	T	~10		LEV 2
66	Felis	concolor stanleyana	W. Texas New Mexico	300 - 500	4	?	S	G	V		NO	T,S	11	1	LEV 2

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
67	Felis	concolor vancouverensis	Vancouver Island, British Columbia	< 500	4	?	S+	AA-1	V	L	NO	T	5	1	N
68	Felis	geoffroyi (Leopardus)	Bolivia, Chile,Paraguay, Argentina, Uruguay, Brazil	>10,000	2	YES	S	G	V	L,Lf,I, H	NO	T,S,M	500	2	LEV 2
69	Felis	geoffroyi geoffroyi											2		
70	Felis	geoffroyi paraguae													
71	Felis	geoffroyi salinarum											9		
72	Felis	guigna guigna (Kodkod) (Oncifelis)	Chile and Argentina	3,000-5,000?	3&4	?	D	C	C/V	L,I	NO	T,S,MLh,Hm	<6	2	P
73	Felis	guigna tigrillo	Chile and Argentina	3,000-5,000	3&4	?	D	C	C	L,I	NO	T,S,M			P
74	Felis	irimotensis (Leopard Cat) (Mayailurus)	Irimote Islands, Japan	100	1	NO	D		C	D, Hyb	YES	T,S, M	?		LEV 2
75	Felis	jacobita Andean Mtn Cat (Oreailurus)	Chile, Peru, Bolivia, Argentina	<1,000	3,4	YES	?	?	C	?	P	T,S,MLh	0	3	LEV 1
76	Felis	manul													
77	Felis	manul ferrugineus (Otocolobus)	SW Turkestan,Iran, Afganistan	>10,000	5	YES	D		V	L,I,H	NO	T,S,HM	0	2	LEV 2
78	Felis	manul manul	Mongolia, W. China, Former USSR	>10,000	5	YES	D		E/V		YES	T,S,H	21		LEV 1

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
79	Felis	manul nigripectus	N.Pakistan,India , Tibet-Nepal	>10,000	5	YES	D		V	L,H,I	NO	T,S,M	0		LEV 2
80	Felis	margarita											22		
81	Felis	margarita harrisonii	S.Arabia, Arabian Pen	<5,000	4	YES	D		E	H	YES	T,S,H	<10		LEV 2
82	Felis	margarita margarita	N. Africa	<5,000	4	YES	D		E	H	YES	T,S,H	0	2	LEV 1
83	Felis	margarita scheffeli	Pakistan	<50	4	YES	D		EXT	T	YES	T,S,H	<5	2	
84	Felis	margarita thinobia	Turkestan	<1,000	4	YES	D		E	H	YES	T,S,H	0	2	LEV 1
85	Felis	marmorata	Asia								YES	H,S,MT	3		
86	Felis (Pardofelis)	marmorata charltoni	Nepal to Burma, S. Tibet	<5,000	5	YES	D		E/V	L,H,I	YES	T,S,HM	4	?	LEV 1
87	Felis	marmorata marmorata	Thailand, Malaysia, Borneo, Sumatra	<5,000	5	YES	D		E/V	L,H,I	YES	T,S,H, M	2		LEV 1
88	Felis	nigripes	Botswana, Namibia, S.Africa			2			E	L	YES		36	2	N
89	Felis	nigripes nigripes	Southwest & Southern Africa	?		YES	D		E	L	NO	S,M, T,H	0	2	LEV 1
90	Felis	nigripes thomasi	Eastern Cape Province				D		E?	L		T		2?	N
91	Felis (Leopardus)	pardalis	C&S America	>10,000	2	YES	D	G	V	L,I Lf	YES	T,S,H	500+	2	LEV 2

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
92	Felis	pardalis albescens	Texas, NE Mexico	<100		NO	D		C	H,I, Hf	YES	T,M, Hm	0	2	LEV 1
93	Felis	pardalis maripensis	C&S America						V			T			
94	Felis	pardalis mearnsi	C&S America						V			T	1		
95	Felis	pardalis mitis	C&S America						V			T			
96	Felis	pardalis nelsoni	C&S America						V			T			
97	Felis	pardalis pardalis	C&S America						V			T	1		
98	Felis	pardalis pseudopardalis	Trinidad, Tobago, Margarita	?		?	?		V			T,S	3		
99	Felis	pardalis pusaeus	C&S America						V			T	1		
100	Felis	pardalis sonorensis	C&S America						V			T			
101	Felis	pardalis steinbachi	C&S America						V			T			
102	Felis	planiceps (Ictailurus)	Asia	>10,000	5	YES	D		E		NO	T,S,H	1	?	LEV 2
103	Felis	rubiginosa							E		YES		5		LEV 1
04	Felis	rubiginosa phillipsi (Prionailurus)	Northern Sri Lanka	1,000	5	YES	D		E		P	T,S,H	16		LEV 1

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
105	Felis	rubiginosa rubiginosa	S. India	>1,000	4	YES	D		E		P	T,S,H	0		LEV 2
106	Felis	serval	Sub Saharan	< 100,000	4	15	D?		S	H	NO	T	194	1	LEV 2
107	Felis	serval beirae (Leptailurus)			4										
108	Felis	serval brachyura			4										
109	Felis	serval constantina							EXT						
110	Felis	serval hamiltoni (=serval)			4										
111	Felis	serval hindei liptosticta			4								4		
112	Felis	serval ingridi (=serval_			4								8		
113	Felis	serval kempi			4								1		
114	Felis	serval kivuensis (=liptosticta)			4										
115	Felis	serval limpopooensis			4										
116	Felis	serval lonnbergi (=serval)			4										
117	Felis	serval liposticta			4										
118	Felis	serval phillipsi			4										

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
119	Felis	serval serval	S. America		4		D						4		LEV 2
120	Felis	serval tanae?			4										
121	Felis	serval togoensis			4										
122	Felis	silvestris (African Wildcat)	?	>100,000	4	D			V	Hyb	NO	T,S	3	1	LEV 2
123	Felis	silvestris brockmani	Africa		4	D			V	Hyb		T,M			
124	Felis	silvestris cafra	Africa		4	D			V	Hyb		T,M			
125	Felis	silvestris caudata	Europe						V	Hyb		T			
126	Felis	silvestris caucasica	Europe						V	Hyb		T	1		
127	Felis	silvestris chutuchta	Europe						V	Hyb		T			
128	Felis	silvestris cretensis	Europe						V	Hyb		T			
129	Felis	silvestris foxi	Africa		4				V	Hyb		T			
130	Felis	silvestris gordoni	United Arab Emeritus	<5,000	4	YES	D		E/V	Hyb	NO	T,S,H	8-30		LEV 1
131	Felis	silvestris grampia (Scth Wildcat)	Scotland	<1,000	4	NO	I		C/V	Hyb	YES	T	3		LEV 2

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
132	Felis	silvestris griselda	Africa												
133	Felis	silvestris haussa	Africa												
134	Felis	silvestris iraki	Iraq, N.Arabia						E	Hyb	NO	T,S,H	?		LEV 1
135	Felis	silvestris issikulensis (=caudata)	Europe						V			T			
136	Felis	silvestris jordansi	Mallorca						E						
137	Felis	silvestris kozlovi (=caudata)	Europe						V	Hyb					
138	Felis	silvestris lybica	Africa	>500,000	4	YES	D		S		NO	T,S,H	2		LEV 2
139	Felis	silvestris matschiei	Europe						V			T			
140	Felis	silvestris mellandi	Africa						V			T			
141	Felis	silvestris molisana?	Europe						V			T			
142	Felis	silvestris morea	Europe						V			T			
143	Felis	silvestris murgabensis (=caudata)	Europe						V			T			
144	Felis	silvestris nesterovi	Iraq-Iran						E			T			

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
145	Felis	silvestris nandae (=udandae)	Africa						V	HYB	NO	T,S,H	?		LEV 1
146	Felis	sivestris ocreata	Africa						V			T			
147	Felis	silvestris ornata	India	<500	5	YES	D		E	H	NO	T,S	6		LEV 1
148	Felis	silvestris pyrrhus	Africa						V			T			
149	Felis	silvestris rubida	Africa						V			T			
150	Felis	silvestris reyi	Europe						V			T			
151	Felis	silvestris sarda	Europe						V			T			
152	Felis	silvestris shawiana (=caudata)	Europe						V			T			
153	Felis	silvestris silvestris	Europe	500,000		YES	D		V		NO	T,S	33		LEV 2
154	Felis	silvestris taitae (=ugandae)	Africa						V				1		
155	Felis	silvestris tartessia	Africa						V						
156	Felis	silvestris tristami	Syria to S. Arabia						E	Hyb	NO	T,S,H	12		LEV 1
157	Felis	silvestris vellerosa	Europe						V						

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
158	Felis	silvestris ugandae	Africa						V						
159	Felis	temmincki							?	L,I			23		
160	Felis	temmincki dominicanrum	S.E.China	<5,000	5	YES	D		E		NO	T,S,HM	0		LEV 2
161	Felis	temmincki temmincki	Malyasia	>10,000	5	YES	D		V/E		YES	T,S,HM	3		LEV 2
162	Felis	temmincki tristis	S. China, N. Burma	<5,000	5	YES	D		E	L,I	NO	T,S,M	0		LEV 2
163	Felis	tigrina													
164	Felis	tigrina guttula	S. Brazil Paraguay	>10,000	3	YES	D	G	E	I,L, Lf	YES	T,H,S	100	2	LEV 1
165	Felis (Leopardus)	tigrina oncilla	Costa Rica to N.Panama	<500	2	YES	D	AA	C	I,L, Lf	NO	T,H,S Hm,Lh	1	2	LEV 1
166	Felis	tigrina pardinoides	Peru,Colombia, Ecuador, W.Venezuela	2500	3	YES	D	F	E	I,L, Lf	YES	T,S,H	50	2	LEV 1
167	Felis	tigrina tigrina	Brazil, Venezuela, Guyana, Surinan	>10,000	3	YES	D	G	E	I,L Lf	YES	S,T,H	~20	2	LEV 1
168	Felis	viverrinus				YES			?		P	T,S,M	60	1	LEV 2
169	Felis (Prionailurus)	viverrinus rizophoreus	Java	<5,000	5	YES	S		V	?	P	T,S,M	0	1	LEV 2

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
170	Felis	viverrinus viverrinus	Asia	<10,000	5	YES	D		V	?	P	T,S	?	1	LEV 2
171	Felis	wiedii	C&S America	>10,000	2	YES	D	G	E	L,Lf	YES	T,S,M	500	2	LEV 1
172	Felis (Leopardus)	wiedii amazonica											2		
173	Felis	wiedii boliviae											1		
174	Felis	wiedii cooperi													
175	Felis	wiedii glaucula											7		
176	Felis	wiedii nicaraguae													
177	Felis	wiedii oaxacensis													
178	Felis	wiedii pirrensis													
179	Felis	wiedii salvinia													
180	Felis	wiedii vigens													
181	Felis	wiedii weidii											9		
182	Felis	wiedii yucatanica													

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
183	Felis	yagouaroundi	S.US, Mexico, C&S America	>10,000	3	YES	D	G	V	I,L Lf	NO	T,S,H	200	1	LEV 1 sub pops
184	Felis	yagouaroundi (Texas) cacomitlli	New Mexico	1000	3&4	YES	D	F	E	I,L Lf	YES	T,S,H	5	1	LEV 1
185	Felis (Herpailurus)	yagouaroundi ameghino							?						
186	Felis	yagouaroundi cacomitli							V				1		
187	Felis	yagouaroundi eyra							V						
188	Felis	yagouaroundi fossata							V				1		
189	Felis	yagouaroundi melantho							V						
190	Felis	yagouaroundi panamensis							V				3		
191	Felis	yagouaroundi tolteca							V				4		
192	Felis	yagouaroundi yagouaroundi							V						
193	Lynx	canadensis	N. Canada Alaska	>100,000	4	?	S	G	S		N	T	73	1	N
194	Lynx	canadensis canadensis													
195	Lynx	canadensis subolanus	Newfoundland										4		N

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
196	Lynx	caracal	Africa,MidEast, Saudi Arabia,India	<100,000	4		S		?	H	YES	T	113	1	N
197	Lynx	caracal algirus			4				S						N
198	Lynx	caracal caracal	Africa		4	YES	D		S		YES		9		N
199	Lynx	caracal damarensis			4		D		S				27		N
200	Lynx	caracal limpopoensis			4				S						N
201	Lynx	caracal lucani			4				S						N
202	Lynx	caracal michaelis	Asia	<500?	5	YES	D		C	L	YES	S,T	6		N
203	Lynx	caracal nubicus							S						N
204	Lynx	caracal poecilotis							S	H			4	1	N
205	Lynx	caracal schmitzi	Asia	<500?	5	YES	D		C	L,H	YES	S,T	0	1	N
206	Lynx	lynx	Europe, MidEast, Asia	>10,000?	5	YES			?		NO	T	44	1	N
207	Lynx	lynx dinniki							S						

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
208	Lynx	lynx isabellina	Asia	>10,000?	5	YES			S						
209	Lynx	lynx kozlovi	USSR	>10,000?	5	YES			S						
210	Lynx	lynx lynx	Europe	?					S				34		
211	Lynx	lynx sardiniae		?					S						
212	Lynx	lynx stroganovi	Former USSR	?					S						
213	Lynx	lynx wrangeli		?					S				47		N
214	Lynx	pardinus (spanish lynx)	Spain/Portugal	<1,000	2	YES	D		C		YES	S	3		LEV 1
215	Lynx	rufus	S.Canada-C.Mexico						S		NO	T	142	1	N
216	Lynx	rufus bailey					S		S		NO	T	2		N
217	Lynx	rufus californicus					S		S		NO	T	4		N
218	Lynx	rufus escuinapae	Mexico	?		?	?		V		YES	T	7		N
219	Lynx	rufus fasciatus	S.Canada-C.Mexico	>100			S		S		NO	T	2		N
220	Lynx	rufus floridanus	S.Canada-C.Mexico	>100			S		S		NO	T	11		N
221	Lynx	rufus gigas	S.Canada-C.Mexico	>100			S		S		NO	T	1		N

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
222	Lynx	rufus oaxacensis	S.Canada-C.Mexico	>100			S		S		NO	T	0		N
223	Lynx	rufus pallescens	S.Canada-C.Mexico	>100			S		S		NO	T	11		N
224	Lynx	rufus peninsularis	S.Canada-C.Mexico	>100			S		S		NO	T	0		N
225	Lynx	rufus rufus	S.Canada-C.Mexico	>100			S		S		NO	T	10		N
226	Lynx	rufus superiorensis	S.Canada-C.Mexico	>100			S		S		NO	T	0		N
227	Lynx	rufus texensis	S.Canada-C.Mexico	>100			S		S		NO	T	6		N
228	Neofelis	nebulosa	Asia	<10,000	4	YES	D		C/E	L,H	P	H,S,M,T	140	3	LEV 1
229	Neofelis	nebulosa brachyurus							C						
230	Neofelis	nebulosa diardi (Subspecies sep unclear)	not in Java	<10,000	4	YES	D		C		NO	T,S,H	1	3	LEV 1
231	Neofelis	nebulosa macrosce-loides					D		C						
232	Neofelis	nebulosa nebulosa					D		C						
233	Acinonyx	jubatus		10,000-15,000					E		YES	S,H	316	2	LEV 1
234	Acinonyx	jubatus hecki	W. Africa	<500	4		D		E		YES	S,H	0		N

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
235	Acinonyx	jubatus jubatus	S. Africa	10,000	3	NO	S		V	H	YES	S,M,H	310		N
236	Acinonyx	jubatus raineyi	S.E. Africa	<1,000	3	NO	D		E		YES	S,H			N
237	Acinonyx	jubatus sommeringii	E. Africa	<2,000	3	NO	D		E		YES	S,H			N
238	Acinonyx	jubatus venaticus	Iran,Former USSR. Africa	<100	4	NO	D		C		YES	S,T	0		N
239	Panthera	leo (African Lion)							?		YES				
240	Panthera	leo azandica	Sub- Saharan Africa		4		D		V	L,H	YES				
241	Panthera	leo bleyenberghi	Sub-Saharan Africa	<1,000	4	YES	D		V	L,H	YES		7500		
242	Panthera	leo krugeri	Sub Saharan Africa	<10,000	3	YES	D		V	L,H,D	YES	T,S,M	24		LEV 1
243	Panthera	leo leo							Ex		YES				
244	Panthera	leo melanchaita							Ex		YES				
245	Panthera	leo nubica	Sub Saharan Africa	10,000	3	YES	D		V	D,H,L	YES	T,S	8		LEV 2
246	Panthera	leo persica	Gir Forest, India	<300	1	NO	S		C	D,I,H	NO	T,S,H	65	1	LEV 1
247	Panthera	leo senegalensis	Senegal	<1,000	4	YES	D		E	L,H	YES	T,S	0		LEV 2
248	Panthera	onca	C&S America	>10,000		YES	D		E	Lf,I	YES	T,S	3,000		LEV 1

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
249	Panthera	onca arizonensis	Mexico	<500	4	YES	D	C	C	H,I,L Lf		Hm,T,S	<10	1	LEV 1
250	Panthera	onca centralis	C. America Columbia, Ecuador	1000	4	YES	D	F	E	H,I,L Lf		Hm,T,S	100	1	LEV 1
251	Panthera	onca goldmani	Yucatan, Beliz, Guatemala	1000	4	YES	D	F	E	H,I,L Lf		Hm,T,S	20	1	LEV 1
252	Panthera	onca hernandesii	Mexico	<500	4	YES	D	C	C	H,I,L Lf		T,S, Hm	40	1	LEV 1
253	Panthera	onca onca	Venezuela, Brazil, Guyana	10,000	2	YES	S	G	E	H,I,L Lf		T,S, Hm	~200	1	LEV 1
254	Panthera	onca palustris	Brazil, Argentina, Uruguay, Paraguay, Bolivia	5,000	2	YES	D	G	E	H,I,L Lf		T,S, Hm	50	1	LEV 1
255	Panthera	onca peruvianus	Ecuador, Peru	<500	4	YES	D	C	C	H,I,L Lf		T,S, Hm	<10	1	LEV 1
256	Panthera	onca veraecruscis	U.S.(?) Mexico	<500	4	YES	D	C	C	H,I,L Lf		T,S, Hm	<10	1	LEV 1
257	Panthera	pardus (Leopard)							?				184	1	N
258	Panthera	pardus adersi	Zanzibar	<50	4	NO	D		C	H,L	YES	T,S	0		N
259	Panthera	pardus adusta	Ethiopia	5,000	3	YES	I		S	H	YES	S,T	0		N
260	Panthera	pardus chui	W.Kenya, Uganda	5,000	3	YES	I		S	H	YES	S,T	0		N

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
261	Panthera	pardus ciscaucasia	Russia, Caucusus	<25	5	YES	D		C	H,L	NO	T,S	0		N
262	Panthera	pardus dathei	Iran,Afganistan	<500	5	YES	D		C	L,H	YES	S	0		N
263	Panthera	pardus delacouri	S.E.Asia	<5,000	4	YES	D		V	L,H	NO	T,S	7		N
264	Panthera	pardus fusca	India	10,000	4	YES	D		V	H,L	NO	S	3		N
265	Panthera	pardus ituriensis	Zaire	>100,000	3	NO	S		S		YES	S,T	0		N
266	Panthera	pardus kotiya	Sri Lanka	<250	3	YES	D		C	L	YES	T,S	40		LEV 1
267	Panthera	pardus japonensis	China	<5,000	4	YES	D RPID		E		NO	T,S	100		LEV 2
268	Panthera	pardus jarvesi EXTINCT	Sinai			NO	D		EXT	H,L	NO	T	0		N
269	Panthera	pardus leopardus	West Africa	<10,000	4	YES	D		V	H,L	YES	T,S	1		N
270	Panthera	pardus melanotica	Cape Africa	<500	3	YES	D		S	H	YES	T,S	8		N
271	Panthera	pardus melas	Java	<500	2	YES	S		E	H,L	NO	T,S	8		N
272	Panthera	pardus millardi	Nepal	<2,000	4	YES	D		V	H,L	NO	T,S	0		N
273	Panthera	pardus nannopardus (poss. ext.)	Somalia	<100	4	YES	D		C	Po	YES	S	0		N
274	Panthera	pardus nimr	Israel, Jordan, Arabia	<100	3	YES	D		C	D	YES	S,T	0		N

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
275	Panthera	pardus orientalis	Siberia, N. Korea, Manchuria	<100	3	YES	D		C	H	NO	T,S,M	136		LEV 1
276	Panthera	pardus panthera	Morocco	<20	3	NO	D		C	L,H	YES	S	0		N
277	Panthera	pardus pardus	Lower Egypt, Upper Sudan	<1,000			D		E	H,L	YES	S,T	0		N
278	Panthera	pardus pernigra	Bhutan	<2,000	4		D		V	H,L	NO	S,T	1		N
279	Panthera	pardus reichenowi	Cameroon	<5,000	4	YES	D		V	H,L	YES	T,S	0		N
280	Panthera	pardus saxicolor	Persia	<500	5	YES	D		E	H,L	NO	T,S,M	129		EEP ON LEV 1
281	Panthera	pardus shortridgei	S. Africa	<100,000	3	YES	D		V	H,L	YES	S,T	SOME		N
282	Panthera	pardus sindica	Pakistan, Iran, Afganistan	<500	5	YES	D		E	H,L	NO	T,S,M	1		N
283	Panthera	pardus suahelica	E. Africa	50,000	3	YES	S		S	H,Po	YES	S,T	0		N
284	Panthera	pardus tulliana	Turkey	<25	4	YES	D		C	H,L	NO	S	0		N
285	Panthera	tigris (no subspecies)													
286	Panthera	tigris altaica	E. Russia	<250	2	YES	D RPD		C	L,Lf,H	YES	T,S,M	711	1	LEV 1
287	Panthera	tigris amoyensis	S. China	40	3	YES	D		C	L,Lf	YES	T,S,M	52	1	LEV 1

	TAXON			WILD POPULATION									CAPTIVE PROGRAM		
CODE	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	M/L STS	THRTS	PVA/ WKSP	RSCH MGMT	NUM	DIFF	REC
288	Panthera	tigris balica EXTINCT		0											
289	Panthera	tigris corbetti		<2,000	4	YES	D		E	L,Lf,H	YES	T,M	14	1	LEV 1
290	Panthera	tigris sondaica EXTINCT		0					Ex						
291	Panthera	tigris sumatrae	Sumatra	400-500	2	YES	STBL		C	L,Lf,H	NO	T,Lr,M	173	1	LEV 1
292	Panthera	tigris tigris	India	<3,500	4	YES	D		E	I,H	YES	T,M	145	1	LEV 1
293	Panthera	tigris virgata EXTINCT		0					Ex						
294	Panthera	unica	Central Asia	5,000-7,000	1	YES	D		E/V	I,H	YES	Hm,M	450	1	LEV 1

Global Captive Action Recommendations (GCARs):

The second component to this felid workshop involved making global captive action recommendations (GCAR). GCARs are derived from the CAMP process. The CAMP recommends which species/subspecies deserve attention and the GCAR determines the target number of animals necessary to sustain a healthy captive global population. This system assumes that captive populations be treated as an integral part of the metapopulations being managed by conservation strategies and action plans. Viable metapopulations may need to include captive components. The IUCN Policy Statement on Captive Breeding recommends, in general, that captive propagation programs be a component of conservation strategies for taxa in which the wild population is fewer than 1,000 individuals. Captive and wild populations should and can be intensively and interactively managed with interchanges of animals occurring as needed and as feasible, after appropriate analysis. There may be problems with interchanges including epidemiologic risks, logistic difficulties and financial limitations. However, limited but growing experience suggests that these problems can be resolved. Strategies and priorities should maximize options while minimizing regrets for species conservation.

Captive populations are a support and a reservoir, not a substitute, for wild populations. The focus of the GCAR is on captive propagation programs that can serve as genetic and demographic reservoirs to support future survival and recovery of wild populations. The GCAR workshop provides strategic guidance for captive programs at both the global and regional level. GCAR workshop activities include considering how the various regional programs for each taxonomic group might interact and combine to catalyze a truly effective global effort. One important aspect is establishing global target population size goals (i.e., how many individuals ultimately to maintain). More specifically, GCARs recommend which taxa are most in need of captive propagation and, thus:

1. which taxa in captivity should remain there.
2. which taxa not yet in captivity should be there.
3. which taxa currently in captivity should no longer be maintained there.

There are multiple genetic and demographic objectives affecting the captive population target; some taxa require large population sizes for a long time, where as others need small nuclei or gene pools that can be expanded later, if needed. One result of the GCAR is to logically adjust current captive population sizes in various regions, to better sustain threatened taxa as well as to identify new space available for conserving other species/subspecies.

In summary, the GCAR provides the strategic framework for establishing global priorities. This information, in turn, can be used by all regional taxon advisory groups to formulate, coordinate and implement effective Regional Collection Plans that together can have a true global conservation impact.

GCAR workshop goals. The goals of the Felid GCAR were:

1. To review CAMP data and discuss required changes.

2. To prioritize taxa in need of captive management and to identify global target population sizes.

3. To evaluate the direction of regional collection plans on the basis of global conservation priorities identified by the GCAR process.

The GCAR process. The GCAR process begins by compiling as much background information as possible on the status of taxa in the wild and in captivity. For this purpose, CBSG utilizes information from Action Plans that may have been formulated by taxonomic Specialist Groups of the SSC. When such plans do not exist, CBSG collaborates with the appropriate Specialist Group to produce the necessary data that will allow the GCAR process to proceed. In most cases, the priorities and program goals determined by the CAMP process, as well as the number of individuals in captivity and the degree of experience and difficulty of captive management for each taxon, are available in the CAMP document. A current census of captive animals found in ISIS abstracts and TAG reports, studbooks and regional inventories also is useful. A major consideration in establishing priority species for captive management is the Mace-Lande Criteria of threat assigned during the CAMP process (see above).

The Felid GCAR process entails considering all these relevant data in intensive and interactive discussion involving experts representing the various organized world regions of the zoo world. The objectives are systematic decision-making, captive program prioritization, initial selection of global species target population sizes and identification of regional distribution of each taxon. This then is followed by determining which species/subspecies and the estimated number of individual animals that should be included in captivity globally.

Target population sizes can be computed using the computer program CAPACITY 3.0 (Ballou, 1992). The CAMP and GCAR processes attempt to achieve a goal of maintaining 90% of the original founder's heterozygosity for 100 years. Other program parameters that are manipulated include:

1. generation length.
2. annual growth rate of the population (lambda).
3. size of the current captive population (N) and the effective population size (Ne).
4. the estimated Ne/N ratio.
5. percentage diversity retained to date.
6. current year

General steps for computing global target population numbers using Ballou's CAPACITY Program, 3.0, are as follows:

1. Calculate the N by assessing the total number of individuals in captivity (from the ISIS TAG reports).
2. Estimate the generation length by determining the median between the earliest age of reproduction and oldest age for reproduction, adjusting for decreasing reproduction with increasing age, if applicable.
3. Determine the crude 'lambda' value (the projected growth rate of the population under ideal conditions). If no better data are available, lambda can be estimated as the crude rate of change (CRC) found in the ISIS TAG report. When the CRC value is less than 1.0, it is necessary to artificially increase lambda to 1.1.
4. Determine the Ne (effective population size) as the number of living breeders (LivBr) taken from the ISIS TAG report, unless more accurate data are available.
5. Calculate the Ne/N (effective population divided by the total population) by dividing the number of living breeders by the total number in captivity.
6. Consider 100% diversity at the onset of the program and the current year as 0 unless the population has been in captivity for a period of time and the loss of genetic

diversity is known.
7. Using the above parameters, the target populations are computed. All world target numbers are based on a 100 year management program with 90% retention of heterozygosity.
8. In some cases, in order to achieve the program goals, it may be necessary to modify one or more variables. For example, the number of available animals may be too few to establish a viable program, and it will be necessary to plan to import new founders into the management program. This can be determined by adjusting the variable of effective population size.
9. Where more accurate information is available (from current international studbooks, for example) those data should be used in place of ISIS values.
10. It in imperative that all details involving the computation of global target populations are documented and included in the final GCAR report.

These steps were used to estimate global population size recommendations for each of the felid species/subspecies recommended for captivity (Table 8). The assumptions used for generating target values for small cat species/subspecies differed slightly from those used for the large cats. The current convention for projecting the necessary captive carrying capacity for small felids, as well as large, is based upon a program goal of retaining 90% of heterozygosity for 100 years. Originally this was in terms of the heterozygosity present in the current wild population. This has been modified for some captive programs to begin with the current captive population without regard for the degree to which the representation of the wild population has occurred. When the calculations begin with the founder stock available in captivity we arrive at unrealistic numbers (400-1000) for many species of small cats that need to be managed in a captive situation worldwide as defined by institutions participating in ISIS or Regional Programs. Small cats have never been successfully managed in large numbers in captive populations for a prolonged period of time. Four strategies were suggested for consideration when developing a program to reduce the number of live animals per taxon that need to be maintained in captive collections for conservation of these species. The four strategies are:
1. Use of a Genome Resource Bank with semen from founders for the taxa to allow periodic reinfusion of founder genetic material into the population to restore and maintain genetic variation (>90% heterozygosity for 100 years) and to effectively extend generation time. In a population of about 80 animals this could be accomplished by 1-2 AIs per generation from the GRB for the species to produce 4 offspring.

2. Securing additional animals from the wild population to provide sufficient numbers of founders for the captive population to reduce the size of population required to maintain 90% of heterozygosity for 100 years. The total number of effective founders required for these species is in the range of 20-30 breeding animals.

3. Planning a systematic program for periodic additions of wild animals (1 or 2 per generation) to the captive population to provide periodic gene flow from the wild population to the captive population. This would allow continuing the program with a 100 year goal with smaller population sizes.

4. Reduction of the projected 100 year time frame for the program goal in these small

felids to a time frame of 25 years which would allow maintenance of smaller populations (80-100 animals depending upon founders and generation time). This would require focusing on a cooperative effort to jointly manage the captive and wild populations with a goal of securing the status of the wild population within this time frame. If unsuccessful, the genetic status of the captive population could be restored with an infusion of genetic material from the wild population. This would encourage captive managers to work with their wild manager counterparts in range countries in developing active management programs for these species, both in situ and ex situ.

This last option is demonstrated in the black-footed cat which currently has a captive population of 41 animals of which 13 are effective founders. Using the Ballou CAPACITY Program, 3.0, and the suggested generation time of 4.5 years for 100 years, it would be necessary to increase the effective founders in the population by five animals and increase the world carrying population to 517 animals, using an Ne/N of .29 and a lambda of 1.25. By reducing the time frame to 25 years a more realistic carrying capacity of 103 animals can be reached, using the same figures as above. Further, a ten year time frame is used, only 34 animals need to be managed in captivity to achieve the program goals. Therefore, it is suggested that, with small cat populations with short generation times, that captive management programs in the CAMP document be projected to a time frame of 25 years, if it proves impossible to implement strategies 1-3. This strategy gives the captive managers and the wildlife managers time to develop a proactive program for the long term management of small felids both in situ and ex situ.

The last step of the GCAR is for individual regions to begin to define specific interest in each recommended species/subspecies, information that later will drive regional responsibilities (i.e., the development of Regional Collection Plans) to preserve an overall viable world population. GCAR spreadsheets are constructed with columns for identification of regions currently holding the taxon and the number of specimens in captivity within that region (see Table 7). Depending on the current captive population distribution and the global target recommendations for the taxon, regional populations targets can be set by each organized region of the zoo community. This, in fact, was done for the North American Region during this workshop and this information comprises the specific Regional Collection Plan found in another section of this book.

This review draft of the GCAR report will be distributed by the CBSG to all participants and to TAG chairs and Species Conservation Coordinators for review and final comments before the document is finalized and distributed globally. The intent is to facilitate regional interaction to optimize the use of captive space and resources for international conservation. It should be re-emphasized that the GCAR document is a 'living' set of guidelines, meaning that it will be reassessed and revised continually based upon new information and shifting needs.

Table 7.

GLOBAL CAPTIVE ACTION RECOMMENDATIONS FOR FELIDS

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
1	Felis	aurata	150,000??	V	N						N.America	0	0												
2	Felis	aurata aurata (=cottoni)	100,000??	V	N						N.America	0	0												
3	Felis	aurata celidogaster	50,000 ??	V	N						N.America	0	0												
4	Felis	badia	<50 ??	C	P						N.America		0												
5	Felis	bengalensis (No subsp.)	1,000,000	S	LEV 2	32	4	10	1.01	284	N.America	11	0												
6	Felis	bengalensis bengalensis		E	LEV 2	22	4	9	1.019	284	N.America	5	0												
7	Felis	bengalensis borneoensis Is.									N.America		0												
8	Felis	bengalensis chinensis				23					N.America		0												
9	Felis	bengalensis euptilura				61					N.America	17	0												
10	Felis	bengalensis horsfieldi									N.America		0												
11	Felis	bengalensis javanensis		V	LEV 2						N.America		0												
12	Felis	bengalensis manchurica									N.America		0												
13	Felis	bengalensis minutus		V	LEV 2						N.America		0												
14	Felis	bengalensis sumatranus		V	LEV 2						N.America		0												
15	Felis	bengalensis travellani									N.America		0												

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION															
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
16	Felis	bieti (also bieti bieti)	>10,000	E	LEV 1	0	4	25	1.5	284	N.America	0	0														
17	Felis	bieti chutuchta	?	E							N.America	0	0														
18	Felis	bieti vellerosa	?	E							N.America	0	0														
19	Felis	chaus	>100,000	S	LEV 2	68	4	17	1.04	284	N.America	8	0														
20	Felis	chaus affinis		S	LEV 2						N.America		0														
21	Felis	chaus chaus									N.America		0														
22	Felis	chaus fulvidina									N.America		0														
23	Felis	chaus furax									N.America		0														
24	Felis	chaus kelaarti									N.America		0														
25	Felis	chaus kutas									N.America		0														
26	Felis	chaus nilotica									N.America		0														
27	Felis	chaus oxiana									N.America		0														
28	Felis	chaus prateri				5					N.America	5	0														
29	Felis	chaus valbalala	500 ?	V	LEV 2	0	4	25	15	284	N.America																
30	Felis	colocolo (No subsp) Pampas Cat	>10,000	E?	LEV 2	30					N.America	0	0														
31	Felis	colocolo budini		E							N.America	0	0														
32	Felis	colocolo colocolo		E							N.America	0	0														

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
33	Felis	colocolo crespoi		E							N.America	0	0												
34	Felis	colocolo garleppi (Mtn Pop)	2,000 - 5,000	E	LEV 1-2	5	6	5	1.2	162	N.America	0	0												
35	Felis	colocolo pajeros		E							N.America	0	0												
36	Felis	colocolo thomasi		E							N.America	0	0												
37	Felis	concolor (no subsp)									N.America	165 GL BL													
38	Felis	concolor acrodocia	?	E	LEV 2						N.America	0	0												
39	Felis	concolor anthonyi	?	E	LEV 2						N.America	0	0												
40	Felis	concolor aruacanubis		E							N.America	0	0												
41	Felis	concolor azteca		V	LEV 2	5					N.America	10													
42	Felis	concolor bangsi	?	E	LEV 2	1					N.America	0	0												
43	Felis	concolor borbensis	?	E	LEV 2						N.America	0	0												
44	Felis	concolor browni		V	LEV 2						N.America														
45	Felis	concolor cabrerae	?	E	LEV 2						N.America	0	0												
46	Felis	concolor califomica	5,000-10,000	V/S	LEV 2	10					N.America	12													
47	Felis	concolor capricornensis	?	E	LEV 2						N.America	0	0												
48	Felis	concolor concolor	?	E	LEV 2	12					N.America	0	0												
49	Felis	concolor coryi	50	C	LEV 1	11	7	7	1.2	90	N.America	14	+?												

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
50	Felis	concolor costaricensis	<200	V	LEV 1-2						N.America	12?	0												
51	Felis	concolor cougar	E?	V	LEV 2	1					N.America	0	0												
52	Felis	concolor greeni	?	E	LEV 2						N.America	0	0												
53	Felis	concolor hippolestes	1,000 - 2,500	V	LEV 2	8					N.America	10													
54	Felis	concolor improcera	?	V	LEV 2						N.America	0	0												
55	Felis	concolor incarum	?	E	LEV 2						N.America	0	0												
56	Felis	concolor kaibabensis	?	V	LEV 2	1					N.America	1													
57	Felis	concolor mayensis	<500	V	LEV 1						N.America	0	0												
58	Felis	concolor missoulensis	>10,000	V/S	LEV 2	5					N.America	10													
59	Felis	concolor oregonensis	>10,000	V/S	LEV 1	10					N.America	7													
60	Felis	concolor osgoodi	?	E	LEV 2						N.America	0	0												
61	Felis	concolor patagonica	?	E	LEV 2						N.America	0	0												
62	Felis	concolor pearsoni	?	E	LEV 2						N.America	0	0												
63	Felis	concolor puma	?	E	LEV 2	7					N.America	0	0												
64	Felis	concolor schorgeri	?	EXT							N.America	0	0												
65	Felis	concolor soderstromii	?	E	LEV 2						N.America	0	0												
66	Felis	concolor stanleyana	300 - 500	V	LEV 2	12					N.America	11													

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
67	Felis	concolor vancouverensis	?	V		2					N.America	1													
68	Felis	geoffroyi (No Subsp)	>10,000	V	LEV 2	36					N.America	14	50												
69	Felis	geoffroyi geoffroyi		V		1					N.America	0	0												
70	Felis	geoffroyi paraguae		V							N.America	0	0												
71	Felis	geoffroyi salinarum		V		6					N.America	0	0												
72	Felis	guigna guigna (Kodkod)	3,000-5,000??	C/V ?	P	6	6	6	1.2	162	N.America	0	0												
73	Felis	guigna tigrillo	3,000-5,000	C	P	?					N.America	0	0												
74	Felis	irimotensis (leopard cat on 1 island)	100	C	LEV 1	0	4	13	1.5	394	N.America	0	0												
75	Felis	jacobita Andean Mtn Cat	<1,000	C	LEV 1	0	6	0	1.2	162	N.America	0	0												
76	Felis	manul (Pallas Cat)		V							N.America	3	50												
77	Felis	manul ferrugineus	>10,000	V	LEV 2	0	4	25	1.5	284	N.America	0	0												
78	Felis	manul manul	>10,000	E/V	LEV 1	10	4	25	1.5	284	N.America	4	50												
79	Felis	manul nigripectus	>10,000	V	LEV 2	0	4	25	1.5	284	N.America	0	0												
80	Felis	margarita				23	4	7	1.5	284	N.America														
81	Felis	margarita harrisonii	<5,000	E	LEV 2	>22	4.5	10	1.25	300	N.America	22	50												
82	Felis	margarita margarita	<5,000	E	LEV 1	0	4.5	0	1.25	244	N.America	0	0												

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
83	Felis	margarita scheffeli	<50	EXT	N						N.America	0	0												
84	Felis	margarita thinobia	<1,000	E	LEV 1	0	4.5	0	1.25	244	N.America	0	0												
85	Felis	marmorata																							
86	Felis	marmorata charltoni	<5,000	E	LEV 1	50	4	25	1.5	284	N.America	0	0												
87	Felis	marmorata marmorata	<5,000	E	LEV 1	2	4	25	1.5	284	N.America	0	0												
88	Felis	nigripes			N						N.America														
89	Felis	nigripes nigripes	?	E	LEV 1	46	4.5	13	1.25	517	N.America	17	50												
90	Felis	nigripes thomasi		E?	N						N.America														
91	Felis	pardalis (No. Subsp)	>10,000	C	LEV 1	500	6	175	1.2	152	N.America	68	0												
92	Felis	pardalis albescens	<100	C	LEV 1	0	5	20	1.02	60	N.America	0	50												
93	Felis	pardalis maripensis		V							N.America	0	0												
94	Felis	pardalis mearnsi		V							N.America	0	0												
95	Felis	pardalis mitis		V							N.America	0	0												
96	Felis	pardalis nelsoni		V							N.America	0	0												
97	Felis	pardalis pardalis		V		1					N.America	0	0												
98	Felis	pardalis pseudopardalis	? ISLAND	V		3					N.America	0	0												
99	Felis	pardalis pusaeus		V							N.America	0	0												

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION															
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
100	Felis	pardalis sonorensis		V							N.America	?	?														
101	Felis	pardalis steinbachi		V							N.America	0	0														
102	Felis	planiceps	>10,000	E	LEV 2	1	4	25	1.5	284	N.America	0	0														
103	Felis	rubiginosa																									
104	Felis	rubiginosa phillipsi	1,000	E	LEV 1	30	4	16	1.03	323	N.America	10	50														
105	Felis	rubiginosa rubiginosa	>1,000	E	LEV 2	0	4	25	1.5	284	N.America	0	0														
106	Felis	serval	<100,000	S	LEV 2	210	4.5	72	1.01	376	N.America	110	30														
107	Felis	serval beirae		S							N.America																
108	Felis	serval brachyura		S							N.America																
109	Felis	serval constantina		EXT							N.America																
110	Felis	serval hamiltoni (=serval)		S							N.America																
111	Felis	serval hindei liptosticta		S		4					N.America																
112	Felis	serval ingridi (=serval)		S		6					N.America																
113	Felis	serval kempi		S		1					N.America																
114	Felis	serval kivuensis (=liptosticta)		S							N.America																
115	Felis	serval limpopooensis		S							N.America																

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
116	Felis	serval lonnbergi (=serval)		S							N.America														
117	Felis	serval lipositcta		S							N.America														
118	Felis	serval phillipsi		S							N.America														
119	Felis	serval serval		S	LEV 2						N.America														
120	Felis	serval tanae?		S							N.America														
121	Felis	serval togoensis		S							N.America														
122	Felis	silvestris			N								0												
123	Felis	silvestris brockmani		V							N.America		0												
124	Felis	silvestris cafra		V							N.America		0												
125	Felis	silvestris caudata		V							N.America		0												
126	Felis	silvestris caucasica		V							N.America		0												
127	Felis	silvestris chutuchta		V							N.America		0												
128	Felis	silvestris cretensis		V							N.America		0												
129	Felis	silvestris foxi		V							N.America		0												
130	Felis	silvestris gordoni	<5,000	E/V	LEV 1						N.America		0												
131	Felis	silvestris grampi	<1,000	C/V	LEV 2	4	5	25	1.12	260	N.America	1	0												
132	Felis	silvestris griselda		V							N.America														
133	Felis	silvestris haussa		V							N.America														

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION															
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
134	Felis	silvestris iraki		E							N.America																
135	Felis	silvestris issikulensis (=caudata)		V							N.America																
136	Felis	silvestris jordansi		E							N.America																
137	Felis	silvestris kozlovi (=caudata)		V							N.America																
138	Felis	silvestris lybica	>500000	S	LEV 2						N.America																
139	Felis	silvestris matschiei		V							N.America																
140	Felis	silvestris mellandi		V							N.America																
141	Felis	silvestris molisana?		V							N.America																
142	Felis	silvestris morea		V							N.America																
143	Felis	silvestris murgabensis (=caudata)		V							N.America																
144	Felis	silvestris nesterovi		E							N.America																
145	Felis	silvestris nandae (=ugandae)		V							N.America																
146	Felis	silvestris ocreata		V							N.America																
147	Felis	silvestris ornata	<500	E	LEV 1	6	4	25	1.5	284	N.America																
148	Felis	silvestris pyrrhus		V							N.America																
149	Felis	silvestris rubida		V							N.America																

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
150	Felis	silvestris reyi		V							N.America														
151	Felis	silvestris sarda		V							N.America														
152	Felis	silvestris shawiana (=caudata)		V							N.America														
153	Felis	silvestris silvestris	500,000	V	LEV 2	31					N.America		0												
154	Felis	silvestris taitae (=ugandae)		V							N.America		0												
155	Felis	silvestris		V							N.America		0												
156	Felis	silvestris tristami		E							N.America		0												
157	Felis	silvestris vellerosa		V							N.America		0												
158	Felis	silvestris ugandae		V							N.America		0												
159	Felis	temmincki									N.America	6	0												
160	Felis	temmincki dominicanorum	<5,000	E	LEV 2	0	4	25	1.5	284	N.America		0												
161	Felis	temmincki temmincki	>10,000	V/E	LEV 1	10	4	5	1.01	284	N.America		0												
162	Felis	temmincki tristis	<5,000	E	LEV 2	30	4	25	1.5	284	N.America		0												
163	Felis	tigrina (Tiger cat)									N.America	4	0												
164	Felis	tigrina guttula	>10,000	E	LEV 1	1					N.America	1	50												
165	Felis	tigrina oncilla	>5,000	C	LEV 1	1	5	1	1.2	258	N.America														

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
166	Felis	tigrina pardinoides	2500	E	LEV 1	50	5	25	1.2	234	N.America														
167	Felis	tigrina tigrina		E							N.America														
168	Felis	viverrinus				60	4	29	1.13	327	N.America	32													
169	Felis	viverrinus rizophoreus	<5,000	V	LEV 2	0	4	25	1.5	284	N.America														
170	Felis	viverrinus viverrinus	<10,000	V	LEV 2	85	4	29	1.13	462	N.America		50												
171	Felis	wiedii (Margay)				400	6	200	1.2	152	N.America	25	0												
172	Felis	wiedii amazonica	>10,000	E	LEV 1	3					N.America														
173	Felis	wiedii boliviae		E							N.America														
174	Felis	wiedii cooperi		E							N.America														
175	Felis	wiedii glaucula		E		2					N.America	1	0												
176	Felis	wiedii nicaraguae		E							N.America														
177	Felis	wiedii oaxacensis		E							N.America														
178	Felis	wiedii pirrensis		E		3					N.America														
179	Felis	wiedii salvinia		E							N.America														
180	Felis	wiedii vigens		E		1					N.America														
181	Felis	wiedii wiedii		E		8					N.America	7?	0												
182	Felis	wiedii yucatanica		E							N.America														

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
183	Felis	yagouaround i									N.America	23	0												
184	Felis	yagouaround i (texas)	1000	V	LEV 1	5	6	5	1.2	162	N.America														
185	Felis	yagouaround i ameghino	>10,000	V	LEV 1						N.America														
186	Felis	yagouaround i cacomitli		V		1					N.America														
187	Felis	yagouaround i eyra		V							N.America														
188	Felis	yagouaround i fossata		V		8					N.America	1													
189	Felis	yagouaround i melantho		V							N.America														
190	Felis	yagouaround i panamensis		V		3					N.America														
191	Felis	yagouaround i tolteca		V		4					N.America														
192	Felis	yagouaround i yagouaround i		V							N.America														
193	Felis	canadensis											30												
194	Lynx	canadensis canadensis	>100,000	S		68					N.America	63													
195	Lynx	canadensis subolanus	>100,000	S		4					N.America	5													
196	Lynx	caracal (no subsp)	<100,000		N						N.America	64													
197	Lynx	caracal algirus		S	N						N.America		0												
198	Lynx	caracal caracal		S	N	9					N.America	2	0												
199	Lynx	caracal damarensis		S	N	30					N.America	20	0												

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
200	Lynx	caracal limpopoensis		S	N						N.America		0												
201	Lynx	caracal lucani		S	N						N.America		0												
202	Lynx	caracal michaelis	<500	C	N	6					N.America	2	50												
203	Lynx	caracal nubicus		S	N						N.America		0												
204	Lynx	caracal poecilotis		S	N						N.America		0												
205	Lynx	caracal schmitzi	<500?	C	N						N.America		0												
206	Lynx	lynx (no subsp)									N.America	3	30												
207	Lynx	lynx dinniki	?	S							N.America														
208	Lynx	lynx isabellina	>10,000	S							N.America														
209	Lynx	lynx kozlovi	>10,000	S							N.America														
210	Lynx	lynx lynx	?	S		48					N.America	3	0												
211	Lynx	lynx sardiniae	?	S							N.America														
212	Lynx	lynx stroganovi	>10,000	S							N.America														
213	Lynx	lynx wrangeli	?	S		48					N.America	17	0												
214	Lynx	pardinus (Spanish lynx)	<1000	C	LEV 1	3	5	25	1.15	240	N.America		0												
215	Lynx	rufus (no subsp)									N.America	121	30												
216	Lynx	rufus bailey		S							N.America	2	0												
217	Lynx	rufus californicus		S		4					N.America	4	0												

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
218	Lynx	rufus escuinapae	?	V	LEV 2	8					N.America	1	0												
219	Lynx	rufus fasciatus	>100	S		1					N.America	1	0												
220	Lynx	rufus floridanus	>100	S		11					N.America	12	0												
221	Lynx	rufus gigas	>100	S		1					N.America	1													
222	Lynx	rufus oaxacensis	>100	S							N.America														
223	Lynx	rufus pallescens	>100	S		9					N.America	9													
224	Lynx	rufus peninsularis	>100	S							N.America														
225	Lynx	rufus rufus	>100	S		20					N.America														
226	Lynx	rufus superiorensis	>100	S		4					N.America	4													
227	Lynx	rufus texensis	>100	S		6					N.America	9													
228	Neofelis	nebulosa	<10,000	C/E	LEV 1	140	7	38	1.03	285	N.America	97	+												
229	Neofelis	nebulosa brachyurus		C							N.America														
230	Neofelis	nebulosa diardi	<10,000	C	LEV 1	1	7	25	1.03	354	N.America														
231	Neofelis	nebulosa macrosceloides		C							N.America														
232	Neofelis	nebulosa nebulosa		C		11					N.America	8													
233	Acinonyx	jubatus		E	LEV 1	1000	5.5	210	1.010	410	N.America	301	300												
234	Acinonyx	jubatus hecki	<500	E	N						N.America														

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
235	Acinonyx	jubatus jubatus	<5,000	V	N	315					N.America	143	143												
236	Acinonyx	jubatus raineyi	<2,000	E	N						N.America														
237	Acinonyx	jubatus sommeringii	<2,000	E	N						N.America														
238	Acinonyx	jubatus venaticus	<100	C	N						N.America														
239	Panthera	leo (African Lion)									N.America	153	+?												
240	Panthera	leo azandica		V							N.America														
241	Panthera	leo bleyenberghi	>1,000	V							N.America														
242	Panthera	leo krugeri	>10,000	V	LEV 1-2	32	9	24	1.25	80	N.America	23	80												
243	Panthera	leo leo		EX		52 (generic)					N.America														
244	Panthera	leo melanchaita		EX							N.America														
245	Panthera	leo nubica	10,000	V	LEV 2	6	9	4	1.25	94	N.America	6	80												
246	Panthera	leo persica	<300	C	LEV 1	89	7	25	1.01	286	N.America	15?	+												
247	Panthera	leo senegalensis	<1,000	E	LEV 2	0	9	0	1.25	94	N.America	0	80												
248	Panthera	onca (No subsp)	>10,000	E	LEV 1	202					N.America	88	50												
249	Panthera	onca arizonensis	<500	C	LEV 1	10	7	5	1.5	162	N.America	4?													
250	Panthera	onca centralis	1000	E	LEV 1	100	7	50	1.5	136	N.America														

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
251	Panthera	onca goldmani	1000	E	LEV 1	20	7	10	1.5	162	N.America														
252	Panthera	onca hemandesii	<500	E	LEV 1	10	7	5	1.5	162	N.America														
253	Panthera	onca onca		E		4					N.America	3													
254	Panthera	onca palustris	5000	E	LEV 1	50	7	25	1.5	162	N.America	2	50												
255	Panthera	onca peruvianus	<500	C	LEV 1	10	7	5	1.5	162	N.America														
256	Panthera	onca veraecruscis	<500	C	LEV 1	10	7	5	1.5	162	N.America														
257	Panthera	pardus (no subsp)									N.America	82													
258	Panthera	pardus adersi	<100	C	N						N.America														
259	Panthera	pardus adusta	5,000	S	N						N.America														
260	Panthera	pardus chui	5,000	S	N						N.America														
261	Panthera	pardus ciscaucasia	<50	C	N						N.America														
262	Panthera	pardus dathei	<500	C	N						N.America														
263	Panthera	pardus delacouri	10,000	V	N	7					N.America	7													
264	Panthera	pardus fusca	10,000	V	N	5					N.America	3													
265	Panthera	pardus ituriensis	100,000 +	S	N						N.America														
266	Panthera	pardus kotiya	<250	C	LEV 1	40	7	13	1.01	276	N.America	0													

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
267	Panthera	pardus japonensis	<10,000	E	LEV 2	106	7	39	1.01	197	N.America	27													
268	Panthera	pardus jarvesi	<10	EXT	N						N.America														
269	Panthera	pardus leopardus	<10,000	V	N	2					N.America														
270	Panthera	pardus melanotica	<500	S	N	8					N.America														
271	Panthera	pardus melas	<500	C	N	8					N.America														
272	Panthera	pardus millardi	<2,000	V	N						N.America														
273	Panthera	pardus nannopardus	<100	C	N						N.America														
274	Panthera	pardus nimr	<100	C	N						N.America														
275	Panthera	pardus orientalis	<100	C	LEV 1	123	7	48	1.13	177	N.America	39													
276	Panthera	pardus panthera	<20	C	N	1					N.America	0													
277	Panthera	pardus pardus	<1,000	E	N	14					N.America														
278	Panthera	pardus pemigra	2,000	V	N						N.America														
279	Panthera	pardus reichenowi	<5,000	V	N						N.America														
280	Panthera	pardus saxicolor	<500	E	LEV 1 (EEP)	130	7	45	1.01	268	N.America	14													
281	Panthera	pardus shortridgei	100,000	V	N						N.America														
282	Panthera	pardus sindica	<1,000	E	N	1					N.America	1													
283	Panthera	pardus suahelica	50,000	S	N						N.America														

	TAXON		CAMP DATA			WORLD					DISTRIBUTION OF CAPTIVE POPULATION														
CODE	SCIENTIFIC NAME		WILD EST#	M/L	REC	N	Gen Lgth	Ne	Lambda	Trg Pop	Loc	Pop	Trg	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop	Loc	Pop
284	Panthera	pardus tulliana	10	C	N						N.America														
285	Panthera	tigris (no subsp)									N.America	58													
286	Panthera	tigris altaica	<250	C	LEV 1	355	7				N.America	104 Global													
287	Panthera	tigris amoyensis	<40	C	LEV 1	20	8	10	1.1	580	N.America														
288	Panthera	tigris balica	0	EX							N.America														
289	Panthera	tigris corbetti	<2,000	E	LEV 1	12	7	2	1.01	267	N.America	10													
290	Panthera	tigris sondaica	0								N.America														
291	Panthera	tigris sumatrae	<500	C	LEV 1	99	7	46	1.04	149	N.America	56													
292	Panthera	tigris tigris	<5,000	E	LEV 1	351	7	84	1.01	279	N.America	2													
293	Panthera	tigris virgata	0	EX							N.America														
294	Panthera	uncia	<10,000	E	LEV 1	482	7	153	1.1	209	N.America	256													