Conservation Assessment and Management Plan (CAMP) Process

Reference Manual

1996

Edited by

Susie Ellis and Ulysses S. Seal

IUCN/SSC Conservation Breeding Specialist Group

Species Survival Commission

A contribution of the IUCN/SSC Conservation Breeding Specialist Group.

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23 July 1997

Conservation Assessment and Management Plan (CAMP) Process

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SECTION 1

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN (CAMP) PROCESS: INTRODUCTION

Conservation Assessment and Management Plan (CAMP)

Introduction

Reduction and fragmentation of wildlife populations and habitats are occurring at a rapid and accelerating rate. The results for an increasing number of taxa are small and isolated populations that are at risk of extinction. For such populations, more intensive management becomes necessary for their survival and recovery. To an ever increasing extent, this intensive management will include, but not be limited to, habitat management and restoration, intensified information gathering, and possibly captive breeding.

The problems for wildlife are so enormous that it is vital to apply the limited resources available for intensive management as efficiently and effectively as possible. Conservation Assessment and Management Plans (or CAMPs) are being developed to respond to this need.

CONSERVATION ASSESSMENT AND MANAGEMENT PLANS (CAMPS)

CAMPs are intended to provide strategic guidance for application of intensive management and information collection techniques to threatened taxa. CAMPs provide a rational and comprehensive means of assessing priorities for intensive management within the context of the broader conservation needs of threatened taxa.

Within the Species Survival Commission (SSC) of IUCN, the primary goal of the Conservation Breeding Specialist Group (CBSG) is to contribute to the development of holistic (i.e., integrating *in situ* and *ex situ)* and viable conservation strategies and action plans. The CAMP process assembles a broad spectrum of expertise on wild and captive management of the taxa under review. CAMPs are conducted as collaborative ventures of CBSG with the taxon-based Specialist Groups of the IUCN/SSC and BirdLife International, or with regional wildlife agencies or non-governmental organizations. Generally, representatives of the organized regional captive breeding programs of the zoo/aquarium world also are included.

A CAMP process brings together 10-40 experts (e.g., wildlife managers, Specialist Group members, scientists from the academic community and/or the private sector, land owners, and captive managers) to evaluate the threat status of all taxa in a broad group (e.g., an order or family), country, or geographic region to set conservation action and information-gathering priorities. The CAMP process also provides an opportunity to test the applicability of the New IUCN Red List Categories.

The New IUCN Red List Categories

The threatened species categories now used in Red Data Books and Red Lists have been in place, with some modification, for almost 30 years (Mace et al., 1994). The Mace-Lande criteria (Mace & Lande, 1991) were one developmental step in an attempt to make those categories more explicit, and were tested extensively in early CAMPs. These criteria subsequently have been revised and formulated into the New IUCN Red List Categories, which also are being tested in the CAMP process.

The New IUCN Red List Categories provide a system that facilitates comparisons across widely different taxa, and is based both on population and distribution criteria. These criteria can be applied to any taxonomic unit at or below the species level, with sufficient range among the different criteria to enable the appropriate listing of taxa from the complete spectrum of taxa, with the exception of micro-organisms (Mace et al., 1994).

The New IUCN Red List Categories are: Extinct (EX); Extinct in the Wild (EW); Critically Endangered (CR); Endangered (EN); Vulnerable (VU); Conservation Dependent (CD); Lower Risk (LR); Data Deficient (DD); Not Evaluated (NE).

The CAMP Process

The CAMP process itself is intensive and interactive and is unique in its ability to facilitate objective and systematic prioritization of research and management actions needed for species conservation, both *in* and *ex situ*. Participants develop the assessments of risks and formulate recommendations for action using a Taxon Data Sheet that allow recording of detailed information about each taxon under review, including data on the status of populations and habitat in the wild as well as recommendations for intensive conservation action. The Taxon Data Sheet is augmented by a spreadsheet that summarizes data written on the Taxon Data Sheet and provides for rapid review or comparison of taxa.

During a CAMP process, the wild and captive status for each taxon under consideration are reviewed, on a taxon-by-taxon basis (usually at the subspecies level). For each taxon, there is an attempt to estimate the total population. It is often very difficult, even agonizing, to be numerate because so little quantitative data on population sizes and distribution exists. However, it is frequently possible to provide order-of-magnitude estimates, especially whether the total population is greater or less than the numerical thresholds for the population data used in determining categories of threat. CAMP spreadsheets include a "data quality" column so that "guesstimates" can be distinguished from population estimates based on solid documentation. The CAMP process attempts to be as quantitative or numerate as possible for two major reasons:

- Action plans ultimately must establish numerical objectives for population sizes and distribution if they are to be viable.

- Numbers provide for more objectivity, less ambiguity, more comparability, better communication and hence cooperation.

Information about population fragmentation and trends, distribution, as well as habitat changes and environmental stochasticity also are considered.

The CAMP process utilizes information from SSC Action Plans that may already have been formulated by the taxon-based Specialist Groups as well as additional data, published and unpublished, from experts on the taxa. CAMPs have been endorsed by the SSC and by BirdLife International as the logical first step toward the development of taxonomic Action Plans where they do not yet exist.

For each taxon reviewed, three kinds of assessments/recommendations are made:

1) assigning taxa to New IUCN Red List Category of Threat;

2) making recommendations for research and management activities to contribute to the taxon's conservation. These recommendations aim to more fully integrate recommended research and management actions and known threats. Research management can be defined as an interactive management program including a strong feedback loop between management activities, evaluation of their effectiveness, and the response of the species;

3) making recommendations for captive programs if they can contribute to the conservation of the taxon. These form the foundation for development of Global Captive Action Recommendations (GCARs) and regional strategic captive collection plans for the zoo and aquarium community.

The CAMP process generally uses a conservative taxonomic approach. In most cases, initial risk assessment and management recommendations are made in terms of the maximal distinction among possible "subspecies" until taxonomic relationships are better elucidated. Splitting rather than lumping maximizes preservation of options. Taxa can always be merged ("lumped") later if further information invalidates the distinctions or if biological or logistic realities of sustaining viable populations precludes maintaining taxa as separate units for conservation.

THE REVIEW PROCESS FOR CAMPs

The results of the initial CAMP process are reviewed: 1) by distribution of a preliminary draft to a small cohort of process participants agreeing to serve as voluntary editors; 2) by distribution to a broader audience which includes CAMP participants, wildlife managers and regional captive programs worldwide; 3) at regional review sessions at various CBSG meetings and processes, taking advantage of local expertise with the taxonomic group in question. Thus CAMPs are not single events although sometimes they are singular events. Instead, they are part

of a continuing and evolving process of developing conservation and recovery plans for the taxa involved. The CAMP review process allows extraction of information from experts worldwide and prioritization of actions based on levels of threat. In nearly all cases, follow-up meetings are required to consider particular issues in greater depth or on a regional basis. Moreover, some form of follow-up will always be necessary to monitor the implementation and effectiveness of the recommendations resulting from the process. In many cases a range of Population and Habitat Viability Assessment (PHVA) process result from the CAMPs.

Over the past five years, CAMPs have been carried out for a wide spectrum of the vertebrates: boid and pythonid snakes; varanid and iguanid lizards; penguins; waterfowl; Falconiformes; megapodes; quail, partridges and francolins; pheasants; cracids; pigeons and doves; cranes; parrots; hornbills; marsupials; primates; canids and hyenas; procyonids; mustelids; viverrids; Felids; cervids; antelope; and Caprinae. Several regional CAMPs have also been conducted: Hawaiian forest birds; endemic Mexican lagomorphs; Costa Rican endemics; endemic bird and mammal species of Panama; South American felids; primate and carnivore species endemic to Mexico; and St. Helena Island endemic plants, invertebrates and vertebrates.

CAMPs are "living" documents that will be continually reassessed and revised as new information becomes available and as global and regional situations and priorities shift. The current CAMP process will continue both by its application to new groups of taxa and regions and the refinement of the ones already under way. Within the next five years CAMP processes will be initiated for all terrestrial vertebrate groups (the so-called tetrapods) and for selected fish, invertebrate, and plant groups. As more and more of the tetrapods are assessed by the CAMP process, the CAMP program is shifting to a regional approach, focusing on particular countries or regions.

The CAMP process is unique in its ability to prioritize intensive management action for species conservation, providing a framework for intensive management in the wild and in captivity. CAMP documents can be used as guidelines by national and regional wildlife agencies as well as regional captive breeding programs as they develop their own action plans. The long-term impact of the CAMP process on global priority setting has the potential to be profound. Within the near future, wildlife and zoo animal managers will have a set of comprehensive documents at their disposal, collaboratively and scientifically developed by the experts on the taxon or region, establishing priorities for global and regional species management and conservation. It is the intent that the CAMP process will ultimately contribute to the wise worldwide use of limited resources for species conservation.

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SECTION 2

THE CAMP PROCESS

The CAMP Process

A CAMP process brings together 10-40 experts (e.g., wildlife managers, Specialist Group members, scientists from the academic community and/or the private sector, land owners, and captive managers) to evaluate the threat status of all taxa in a broad group, country or region. CAMPs can be initiated by wildlife agencies, non-governmental organizations, or Specialist Groups; CAMPs are organized in collaboration with and facilitated by the IUCN/SSC Conservation Breeding Specialist Group. The list of invitees to a CAMP is generated by the host/organizer in collaboration with the appropriate SSC or BirdLife International Specialist Group and CBSG. CBSG may suggest additional participants, but the primary responsibility for generating a list of invitees lies with the host/organizer.

The CAMP process is intensive and interactive, generally taking place over a full three- or three-and-one-half day period, including evenings. Participants arrive the day before the CAMP begins and depart on the fourth day. CAMPs generally are held at a location that minimizes outside disturbance, with meals brought in to minimize distractions.

The meeting agenda is compiled by the host/organizer, with input from the CBSG office and/or the appropriate Specialist Group Chair. Usually, there are several overview presentations on the first morning which discuss the general status of the taxonomic group or region (e.g., conservation status and general threats), as well as a specific presentation on the CAMP process by CBSG. After preliminary presentations Working Groups are organized to review the taxonomic groups or taxa within the region coinciding with their expertise. Working Groups report back to the other participants in plenary sessions several times during the course of the process. Participants work to reach consensus on assessments and recommendations prior to the process' end. It is the aim to complete a draft CAMP document by the end of the third day.

There are several ground rules made explicit at the beginning of a CAMP process:

* Every idea or plan or belief about the Taxon or Region can be examined and discussed.
* Everyone participates in discussions and no one dominates.
* Set aside (temporarily) all special agendas except conserving the Taxon or Region in question.
* Assume good intent of all participants. Treat other participants with respect.
* Stick to the schedule .. begin and end promptly.
* The primary work will be conducted in sub-groups
* Facilitators of plenary sessions or working groups can call 'time out'

when discussions reach an impasse or stray too far off the topic at hand.

* Agreements or recommendations are reached by consensus.
* Plan to complete and review a draft report by the end of the meeting.
* Flexibility is key. We will adjust our process and schedule as needed to achieve our goals.

Working Group Tasks: the CAMP Spreadsheet and Taxon Data Sheets

In each working group, two people are key: 1) the facilitator; and 2) the Taxon Data Sheet recorder. Working group facilitators are designated by the CAMP facilitators and organizers. It also is essential that in each working group one person keep master Taxon Data Sheets for each taxon. S/he generally enters them into a computer as they are discussed. **Taxon Data Sheet information should be checked as each is completed to be sure that all data have been recorded.**

Each participant is given a spreadsheet at the beginning of the process. An important step for each working group is to examine the taxonomic list on the spreadsheet to make sure that it is complete. After the list is checked for taxonomic correctness, working group participants begin to systematically work through the taxa, making assessments and making recommendations on the Taxon Data Sheets. A Taxon Data Sheet category explanation sheet, such as the one that follows, is provided to explain the various data categories. A sample Taxon Data Sheet typically used for mammals is included as Appendix I in this section; sample Taxon Data Sheets for Birds and for Plants are included as Appendices II and III. Sample spreadsheets for vertebrates are included as Appendix IV in this section. Blank taxon data sheets for mammals, birds and plants are included as Appendices IV - VI. Blank spreadsheets for vertebrates and plants are included as Appendices VII and VIII, respectively.

Conservation Assessment and Management Plan (CAMP) Process

Taxon Data Sheet Categories

The Conservation Assessment and Management Plan (CAMP) taxon data sheet is a working document that provides information that can be used to assess the degree of threat and recommend conservation action. The first part of the sheet summarizes information on the status of the wild and captive populations of each taxon. It contains taxonomic, distributional, and demographic information useful in determining which taxa are under greatest threat of extinction. This information can be used to identify priorities for intensive management action for taxa.

SCIENTIFIC NAME: Scientific names of extant taxa: genus and species (or subspecies where appropriate).

TENTATIVE IUCN: Tentative Status according to the New IUCN Red List criteria (additional materials will be provided at the CAMP)

CR = Critically Endangered
EN = Endangered
VU = Vulnerable
CD = Conservation Dependent
LR = Low Risk
DD = Data Deficient
NE = Not Evaluated

CRITERIA BASED ON: Indicate which of the New IUCN Red List criteria were used to assign a category of threat:

PR = Population reduction (A1a, or A2b, etc.)
EO = Extent of occurrence (B1, or B2a, B3c, etc.)
PE = Population estimates (C1, or C2a, etc.)
NM = Number of mature individuals (D)
PX = Probability of extinction (E)

CITES: List the CITES Appendix on which the species is listed, if appropriate.

OTHER: List whether the species has been assigned threatened status in other venues, e.g., nationally or in other conservation assessments.

TAXONOMIC STATUS: This indicates the taxonomic status of the extant taxa. Taxonomic uncertainties may be discussed in this section. Subspecies not considered separately should be listed here along with their distribution.

CURRENT DISTRIBUTION (BREEDING AND WINTERING): List the geographical extent of the breeding and wintering locations of the species.

CONCENTRATED MIGRATION REGIONS: List the regions in which migration is concentrated, especially those in which the birds may face some degree of threat.

HISTORICAL DISTRIBUTION: List the historical distribution of the species

EXTENT OF OCCURRENCE: List the actual size of the area in which the species occurs, if possible. Also list the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred, or projected sites of present occurrence of a taxon, excluding cases of vagrancy (Figure 1). This measure does not take account of discontinuities or disjunctions in the spatial distributions of taxa. Extent of occurrence can often be measured by a minimum convex polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).

A: < 100 km2
B: 101 km2 - 5,000 km2
C: 5,001 km2 - 20,000 km2
D: larger than 20,001 km2

AREA OF OCCUPANCY: List the area within the 'extent of occurrence' which is actually occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may, for example, contain unsuitable habitats. The area of occupancy is the smallest area essential at any stage to the survival of a taxon (e.g., colonial nesting sites, feeding sites for migratory taxa). The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relent biological aspects of the taxon. The criteria include values in km2, and thus to avoid errors in classification the area of occupancy should be measured on grid squares or equivalents which are sufficiently small (see Figure 1).

A: < 10 km2
B: 11 km2 - 500 km2
C: 501 km2 - 2,000 km2
D: larger than 2,001 km2

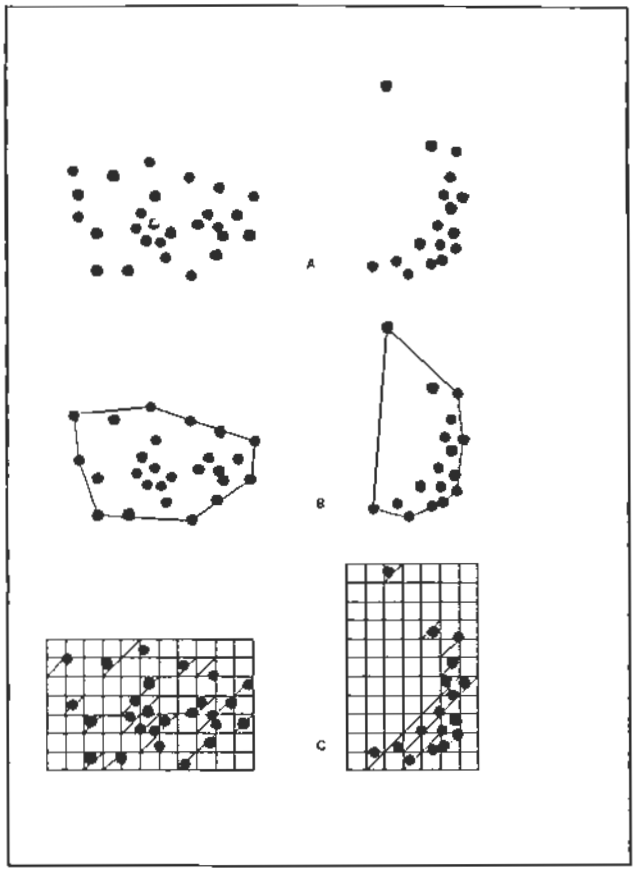

Fig. 1. Two examples of the distinction between the extent of occurrence and area of occupancy. (a) and (b) are the spatial distribution of known, inferred, or projected sites of occurrence. (c) and (d) show one possible boundary to the extent of occurrence, which is the measured area within this boundary. (e) and (f) show one measure of area of occupancy which can be measures by the sum of the occupied grid squares.

LOCATIONS: Note the number of locations in which the taxon is found. If the population is fragmented, indicate "F" after the number of locations.

POPULATION TRENDS - % CHANGE IN YEARS OR IN GENERATIONS: If possible, list the trend of the population (stable, declining, or increasing). If possible, list the percent of change over a particular time frame (e.g., 10 or 20 years) or number of generations. Specify the number of years or generations over which the decline has occurred, e.g., 10%/2g or 20%/20 yrs.

GENERATION TIME: Indicate the number of years in a generation. A generation is defined as the average age of parents in the population.

WORLD POPULATION: List the estimated numbers of pairs in the wild. If specific numbers are unavailable, estimate the general range of the population size.

REGIONAL POPULATION(S): List the estimated number of pairs in any particular region for which there are data, followed by the location.

DATA QUALITY:
List the actual age of the data used to provide the population estimates. Also list the type of data from which the estimates are provided.
1 = Reliable census or population monitoring
2 = General field study
3 = Informal field sightings
4 = Indirect information (trade numbers, habitat availability).

Any combination of above = different data quality in parts of range.

RECENT FIELD STUDIES: List any current or recent field studies, the name of the researcher and the location of the study.

THREATS: List immediate or predicted events that are or may cause significant population declines. These may include:

A = Aircraft
C = Climate
D = Disease
Dp = Decline in prey species
Dr = Drowning
F = Fishing
G = Genetic problems
H = Hunting
Hf = Hunting for food
Hm = Hunting for medicine
Ht = Hunting for trophies
Hyb = Hybridization
I = Human interference, persecution, or disturbance
Ic = Interspecific competition
Ice = Interspecific competition from exotics
Il = Interspecific competition with domestic livestock
L = Loss of habitat
La = Loss of habitat because of exotic animals

Lf = Loss of habitat because of fragmentation
Lp = Loss of habitat because of exotic plants
M = Marine perturbations, including El Niño and other shifts
N = Nutritional disorders or problems
P = Predation
Pe = Predation by exotics
Ps= Pesticides
Pl= Powerlines
Po= Poisoning
Pu= Pollution
S = Catastrophic events
  Sd: drought
  Sf: fire
  Sh: hurricane
  St: tsunami
  Sv: volcano
T = Trade for the live animal market
  Tp: trade for parts, including skins
W = War

TRADE:
Was the species present in Trade according to CITES records? If so, list year(s).

COMMENTS: Note any additional information that is important with respect to the conservation of the species.

RECOMMENDATIONS:
RESEARCH MANAGEMENT:
It should be noted that there is (or should be) a clear relationship between threats and subsequent outlined research/management actions. The "Research/Management" column provides an integrated view of actions to be taken, based on the listed threats. Research management can be defined as a management program which includes a strong feedback between management activities and an evaluation of the efficacy of the management, as well as response of the bird species to that activity. The categories within the column are as follows:

T = Taxonomic and morphological genetic studies
Tl = Translocations
S = Survey - search and find
M = Monitoring - to determine population information
H = Husbandry research
Hm = Habitat management - management actions primarily intended to protect and/or enhance the species' habitat (e.g., forest management)

Lm = Limiting factor management - "research management" activities on known or suspected limiting factors. Management projects have a research component that provide scientifically defensible results.

Lr = Limiting factor research - research projects aimed at determining limiting factors. Results from this work may provide management recommendations and future research needs

Lh = Life history studies

O = Other (record in detail on taxon data sheet)

PHVA: Is a Population and Habitat Viability Assessment process recommended to develop an intensive management/recovery plan for the species?

Yes, No or Pending further data from surveys or other research.

NOTE**A detailed model of a species' biology is frequently not needed to make sound management decisions.

CAPTIVE PROGRAM RECOMMENDATIONS:

Level 1 (1) - A captive population is recommended as a component of a conservation program. 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.

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.

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 SSC Action Plans.

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.

LEVEL OF DIFFICULTY: What is the level of difficulty in maintaining the species in captive conditions?

1 = Least difficult. Techniques are in place for capture, maintenance, and propagation of similar taxa in captivity, which ostensibly could be applied to the taxon.

2 = Moderate difficulty. Techniques are only partially in place for capture, maintenance, and propagation of similar taxa in captivity, and many captive techniques still need refinement.

3 = Very difficult. Techniques are not in place for capture, maintenance, and propagation of similar taxa in captivity, and captive techniques still need to be developed.

EXISTING CAPTIVE POPULATION: Number of individuals in captivity according to the International Species Information System. Please add other information, when available, as the numbers listed consist of only a portion of the captive population.

SOURCES: List sources used for information for the above data. (Author's name, year, title of article or book, journal, issue, and page numbers).

COMPILERS: List the names of the people who contributed information for this taxon data sheet.

Assigning New IUCN Red List Categories

Each taxa reviewed during the CAMP process is assigned a New IUCN Red List Category of Threat. The process of assigning a taxon to a category of threat relies heavily on the data concerning threats, population numbers, trends, and distribution. CAMP participants should read the paper by Mace and Stuart (1994) in Section 4 of this Manual before beginning this process. The steps in making these evaluations is illustrated in Figure 1. For taxa suspected to be threatened (Critical, Endangered, or Vulnerable), criteria listed Table 1 are used to make the assignment to a threat category. **The criteria used to make the assessment (e.g., A1a, B1, D, etc.) should be recorded on the Taxon Data Sheet under "Criteria based on."**

IUCN: Status according to New IUCN Red List criteria:

EXTINCT (EX)
A taxon is **Extinct** when there is no reasonable doubt that its last individual has died.

EXTINCT IN THE WILD (EW)
A taxon is **Extinct in the Wild** when it is known only to survive in cultivation, in captivity, or as a naturalized population (or population) well outside the past range.

CRITICALLY ENDANGERED (CR)
A taxon is **Critically Endangered** when it is facing an extremely high risk of extinction in the wild in the immediate future as defined by the criteria listed in Table 1.

ENDANGERED (EN)
A taxon is **Endangered** when it is not Critical but is facing a very high risk of extinction in the wild in the near future, as defined by the criteria listed in Table 1.

VULNERABLE (VU)
A taxon is **Vulnerable** when it is not Critical or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by the criteria listed in Table 1.

CONSERVATION DEPENDENT (CD)
Taxa which do not currently qualify under any of the categories above may be classified as **Conservation Dependent**. To be considered **Conservation Dependent**, a taxon must be the focus of a continuing taxon-specific or habitat-specific conservation program which directly affects the taxon in question. The cessation of this program would result in the taxon qualifying for one of the threatened categories above.

LOWER RISK (LR)
A taxon is **Low Risk** when it has been evaluated and does not qualify for any of the categories Critical, Endangered, Vulnerable, Susceptible, Conservation Dependent, or Data Deficient.

DATA DEFICIENT (DD)
A taxon is **Data Deficient** when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status.

NOT EVALUATED (NE)
A taxon is **Not Evaluated** when it has not yet been assessed against the criteria.

Figure 1. The process for deriving IUCN Red List Categories

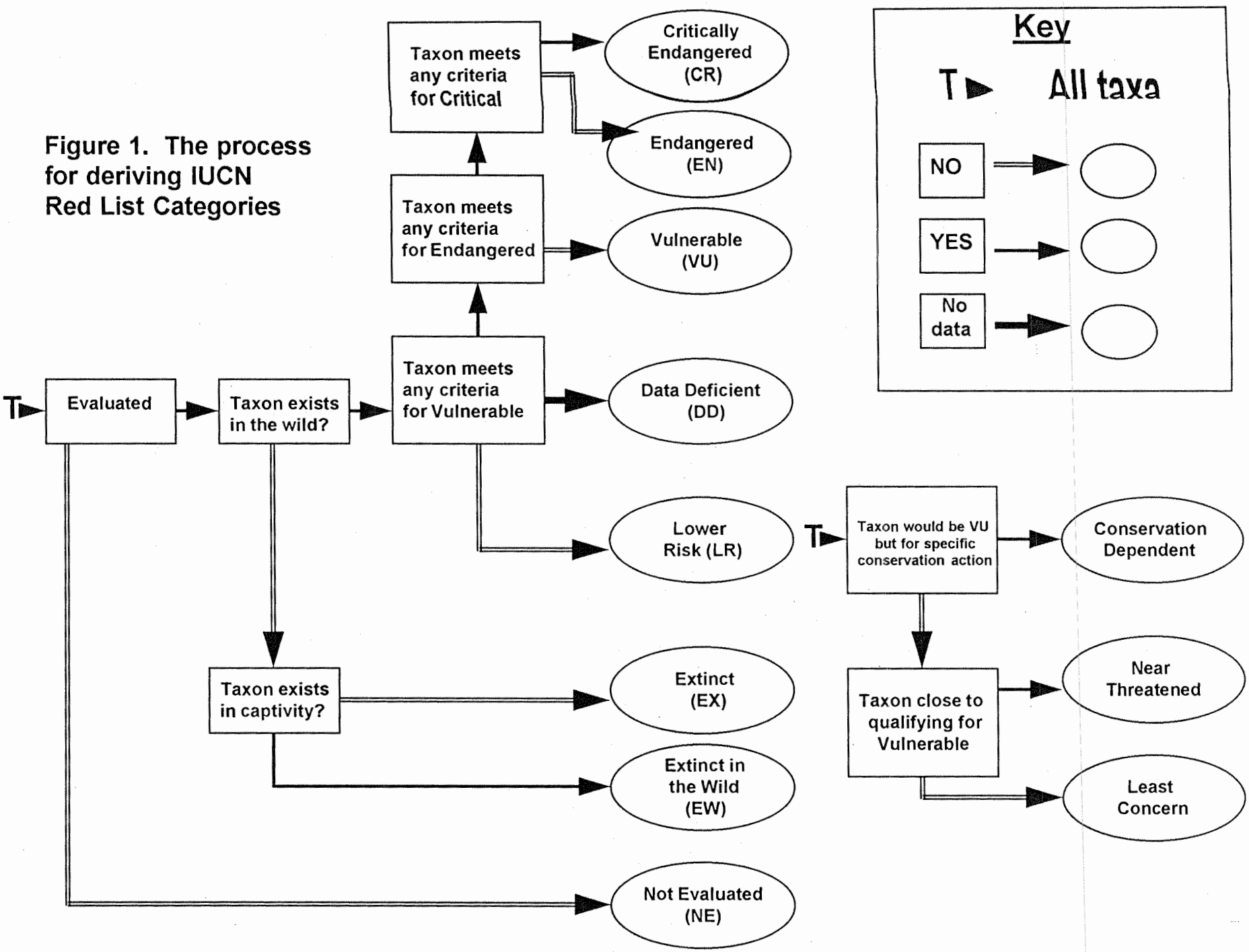

Table 1. Assigning New IUCN Red List Categories of Threat

ANY of the following criteria may be used to assign categories:	CRITICAL	ENDANGERED	VULNERABLE
A. Population reduction	1) ≥ 80% decline in last 10 yrs based on:	1) ≥ 50% decline in last 10 yrs or 2 generations based on:	1) ≥ 50% decline in last 20 yrs or 5 generations based on:
	a) direct observation OR b) decline in area of occupancy, occurrence and/or habitat quality OR c) actual or potential levels of exploitation OR d) introd. taxa, hybridization, pathogens, pollutants, competitors or parasites		
	OR	OR	OR
	2) ≥ 80% decline/10yrs predicted in near future based on (b), (c), (d), or (e) above	2) ≥ 50% decline/10 yrs or 2 generations predicted in near future based on (b), (c), (d), or (e) above	2) ≥ 50% decline/20 yrs or 5 generations predicted in near future based on (b), (c), (d), or (e) above
B. Extent of occurrence	Est. <100 km² or area of occupancy est. <10 km², AND TWO of the following:	Est. <5,000 km² or area of occupancy est. <500 km², AND TWO of the following:	Est. <20,000 km² or area of occupancy est. <2,000 km², AND TWO of the following:
	1) Severely fragmented OR single location.	1) Severely fragmented OR ≤ 5 locations	1) Severely fragmented OR ≤ 10 locations
	2) Continuing decline observed, inferred, or projected in ANY of the following: a) extent of occurrence b) area of occupancy c) area, extent, and/or quality of habitat d) # of locations or subpopulations e) # of mature individuals		
	3) Extreme fluctuations in ANY of the following: a) extent of occurrence b) area of occupancy c) # of locations or subpopulations		
C. Population estimates	Est. <250 mature indivs. AND:	Est. <2,500 mature indivs. AND:	Est. <10,000 mature indivs. AND:
	1) Decline ≥25% within 3 yrs or one generation, whichever is longer	1) Decline ≥15% within 5 yrs or 2 generations, whichever is longer	1) Decline ≥20% within 10 yrs or 3 generations, whichever is longer
	OR	OR	OR
	2) Continuing decline, observed, projected, or inferred in mature individuals AND population structure EITHER a) no pop. w/>50 mature indivs. OR b) all indivs. in single subpop.	2) Continuing decline, observed, projected, or inferred in mature individuals AND population structure EITHER a) no pop. w/>250 mature indivs. OR b) all indivs. in single subpop.	2) Continuing decline, observed, projected, or inferred in mature individuals AND population structure EITHER a) no pop. w/>1,000 mature indivs. OR b) all indivs. in single subpop.
D. # of mature individuals	Est. < 50 mature individuals	Est. < 250 mature individuals	1) Est. < 1,000 mature individuals OR 2) Area of occupancy < 100km² or <5 locations
E. Probability of extinction	≥ 50% within in 5 yrs or 2 generations, whichever is longer	≥ 20% within 20 yrs or 5 generations, whichever is longer.	≥ 10% within 100 yrs

APPENDIX I.
SAMPLE MAMMALIAN TAXON DATA SHEET

SPECIES: *Alouatta palliata mexicana*

COMMON NAME: Mantled howler monkey, mono aullador, saraguato, mono zambo (Mexico); saraguate (Guatemala).

STATUS:

IUCN: Vulnerable
Criteria based on: B1; B2a,b,c
Distribution range < 20,000 Km ^{2}
1994 Red List: Insufficiently Known (as *A. villosa*, 1990)
CITES: Appendix I (species level, 1986).
Other: In danger of extinction (SEDESOL, 1994).

TAXONOMIC STATUS: Subspecies

DISTRIBUTION:
Original: States of Veracruz, Tabasco, Oaxaca and Chiapas, in Mexico (though it is doubtful that it exists in Campeche and Quintana Roo, as reported by Elliot 1904?; Díaz de León, 1905; Villa 1959?); Belize (?) and Guatemala, in Central America.

Current: In Mexico: Volcán de San Martín Tuxtla, Sierra de Santa Martha y Uxpanapa, in Veracruz; Macuspana and Teapa, in Tabasco; Chimalapas in Oaxaca; The Ocote and Manzanillar (Mpio. de Juárez), in Chiapas.

In Guatemala: North? and south of Guatemala (Río Dulce and Tikal National Park?).

In Belize: It is reported to likely be sympatric with *A. pigra*, although this has not been confirmed (Horwich, 1986).

Note: There probably are habitat fragments in which wild populations of this subspecies exist, outside of the considered natural areas.

ELEVATION: From sea level until 1100 m.

WILD POPULATION: Approximately 21,000 individuals (taking the density data estimated by Estrada, 1994, of 3.6 animals per km^2). It is possible that the total population has been overestimated, even though it was calculated with the lowest reported population density and projected with a moderate estimate of available habitat. This may reflect that not all available habitat is occupied by this primate.

Data Quality: Recent census (< 10 years) or monitoring of the population; recent general field study (< 10 years); occasional sightings in field and indirect information (availability of habitat)

Sub-Population: Fragmented.

Trend: Accelerated decline.

Area: 5,840 km ^{2}.

FIELD STUDIES:
Estrada, A. (1982) Census in Veracruz.
Estrada, A. (1984) Food habits and home range.
Estrada, A. and Coates-Estrada, R. (1984; 1986) Seed dispersion.
Estrada, A. and Coates-Estrada, R. (1984) Conservation of primates.
Estrada, A. and Coates-Estrada, R. (1985) Biomass of mammals.
Estrada, A. and Coates-Estrada, R. (1986) Foraging.
Estrada, A. and Coates-Estrada, R. (1986) Interspecific competition.
Horwich and Johnson (1986) Distribution in Belize.
Rodríguez-Luna and colleagues. (1987) Conservation of primates in Mexico.
Estrada, A. and Coates-Estrada, R. (1988) Structure of populations.
Serio-Silva, J. C. (1992) Food habits and standard daily activities semi-free-range conditions
Serio-Silva, J. C. and colleagues. (1992) Social distance.
Rodríguez-Luna and colleagues. (1993) Translocation.
Estrada, A. and Coates-Estrada, R. (1994) Conservation of primates in Veracruz.
Canales-Espinosa (1994) Parasitology.
Carrera-Sánchez, E. (1994) Behavior in semi-free-range conditions.
Cortés-Ortiz, L. and colleagues. (1994) Reproduction in semi-free-range conditions.

THREATS: Loss of habitat; loss of habitat by fragmentation; wild life trade; hunting for food; interference, persecution or human disturbance; war; catastrophic events (fire); disease and genetic problems (as an influencing factor for isolated and small populations; current field reports that demonstrate that isolated populations are affected by parasites and disease).

Trade: Yes (the majority of the animals are sold as pets; there are no studies with respect to this).

COMMENTS: This is the Mexican primate that shows the greatest plasticity to adapt to perturbations in its habitat and to different types of vegetation. The size of the population is better suited to that of the range of the category "Endangered", under the current criterion of the IUCN (Mace-Stuart, Version 2.2: 1994). It will be important to define opportunities to conserve subspecies of this species in protected areas. This is an important consideration for

determining *in situ* conservation activities.

RECOMMENDATIONS:

Research Management: Translocation; survey and census; monitoring to determine population information; captive studies; habitat protection; limiting factors investigation; natural history studies; other studies (reproductive biology, investigation to assure the *in situ* conservation).

Currently Under way: demography, ecology, behavior, molecular genetics, conservation biology.

PHVA: Yes.

CAPTIVE POPULATION: According to ISIS reports (1993), 10 individuals recognized as *A. palliata* are found in zoos (70% born in captivity; 30% wild born); most are likely *A. p. mexicana.*

According to the SARH inventory for captive populations in Mexico (1994), there are 7 individuals identified at the subspecies level; and 79 animals in semi-captive and/or semi-free-ranging conditions.

CAPTIVE PROGRAMS: This species is moderately difficult to maintain/propagate in captivity. A captive program is not currently recommended to contribute demographically or genetically to the conservation of the subspecies, but it is recommended for education, research, and management investigations.

Sources: See field studies section above.

Compilers: Ernesto Rodríguez Luna, Liliana Cortés Ortiz, Juan Carlos Serio Silva, Domingo Canales Espinosa, Francisco García Orduña, Edith Carrera Sánchez, Guadalupe Medel Palacios, Laura Eugenia Domínguez Domínguez, Jorge Morales Mávil, Ricardo López Wilchis, Alejandro Hernández Yáñez, José Abel Contreras Maraveles, Perla Cifuentes Calderón, Adriana D'Amiano Aispuro, Frank Carlos Camacho Wardle, Jorge Paredes González, Tracey Reddig, Fernando Pacheco, Francisco José Gómez Marín, María del Socorro Morales Martínez

APPENDIX II.
SAMPLE AVIAN TAXON DATA SHEET (INCOMPLETE)

SPECIES: *Morphnus guianensis* Guiana Crested Eagle
STATUS: Tentative IUCN: Vulnerable
Criteria based on: E (also B1 or B2 if area occupied data were available)
CITES: Appendix II
Other: Listed in *Birds to Watch 2* (Collar, Crosby, & Stattersfield, 1994)

Taxonomic status: Includes *M. taeniatus,* a variant of dark morph with heavily banded underparts. Monotypic.

Current Distribution (breeding and wintering): Guatemala and Belize (possibly extreme SE Mexico) S locally through Central America to Colombia and S to Paraguay; extreme NE Argentina (Misiones) and S Brazil; W of Andes, ranges S only to Serranía de Baudó (W Colombia)

Concentrated Migration Regions:
Historical Distribution:
Extent of Occurrence: More than 20,000 km2
Area Occupied:
Number of Locations: 1; fairly continuous distribution throughout range

Population Trend - % change in years or generations: (rate of decline probably at least as fast as rate of loss of primary forest)

Trend over past 100 years:
Generation Time:

World Population: Unknown
Regional Population(s):
Data Quality: 3/4

Recent Field Studies: Study underway at Tikal, Guatemala by Peregrine Fund's "Maya Project" since 1994; 2 nests to date, 1 successful. Only prior study that of Bierregaard in Brazil.

Threats: Habitat loss and fragmentation, hunting (all large raptors are occasionally shot and eaten, at least in Central America)

Trade: No

Comments: Formerly red-listed in category Rare, but currently considered near-threatened. Sparsely distributed throughout extensive tropical forests and gallery forests in S of range. Not immediately threatened but large size and low population densities make species particularly sensitive to hunting pressure that accompanies any human incursions into forests, and to deforestation/fragmentation. Many old records from Chocó region (NW Colombia), which is now widely deforested; similar extensive deforestation in Central American parts of range suggest that local contraction of range or serious declines in population density may already have occurred. Thought to be able to sustain small amounts of human pressure slightly better than *H. harpyja,* although apparently rarer than that species in several areas, e.g., Venezuela, Surinam.

Recent Peregrine Fund research in Petén, Guatemala, and other observations, have demonstrated that the species is widespread and regular, though uncommon, in Petén and Belize; probably occurs in adjacent southernmost Mexico. Hard to detect, as rarely if ever soars above the forest; best means of detection is acoustical luring using conspecific calls or distressed prey. Wild guess of nesting population in 576 km square Tikal National Park is 10-20 pairs (compared to 50-80 pairs for *Spizaetus ornatus).* Far more common than Harpy Eagle in this region; many "Harpy" sightings are probably *Morphnus.* 80 prey items at Tikal: 70 % nocturnal, arboreal mammals, 20 % birds, 10 % snakes; apparently hunts in and below canopy.

Recommendations:

Research Management: Survey, monitoring, habitat management, limiting factors research, limiting factors management
PHVA: Pending

Captive Program Recommendation: Pending PHVA
Level of Difficulty: 2
Existing Captive Population (ISIS): None

Sources:

Compilers: David Whitacre; Juventino and Gregorio Lopez

APPENDIX III.
SAMPLE PLANT TAXON DATA SHEET (INCOMPLETE)

SPECIES (& synonyms): Asparagus rottleri

Taxonomic status: Species

Habit: Herb Habitat: Not known

Distribution; ? endemic
Range-km^2:
Area Occupied-km^2:
Fragmentation (# subpopulations ?):

Wild Population; ?
% Decline:
Time/Rate (Years or generations):
Mature Individuals:

Data Quality, (See key, Sources, Dates): nil

Field Studies (Who & Dates, Ref.): General floristic studies

Threats (See key): L

Trade: Not known

Other Comments:

STATUS: IUCN (Revised): D. D.
Criteria based on:

CITES:

Recommendations:
PHVA:
Research management (Code): Survey to locate the plants
Cultivation Program: Propagate through micro and macro methods

Genetic Management:

Cultivated Population (Current Status & Locations & Difficulty):
Botanical Gardens:
Commercial/Domestic:
Herbaria (or Seed banks):

Sources:

Compilers:

APPENDIX IV. SAMPLE VERTEBRATE CAMP SPREADSHEET

LN #	TAXON		WILD POPULATION												CAP POP		
	Species		Range	Ext Occ	Area Occ	# Loc	%Decl	Yr/ Gn	Pop #	DQ	Thrts	IUCN	Criter Used	Res Mgmt Recs	PHV A	Cap Rec	Diff	ISIS Cap N
1	Cathartes	aura	N America to Patagonia	D		1			>1 MIL	2	None	LR		T	N	3	1	128
2	Cathartes	burrovianus	E Mexico to N Argentina	D		1			?		None	LR		T,Lh	N	NO	1	1
3	Cathartes	melambrotus	C South America	D		5			?		L	LR		Hm, T,Lh	N	NO	1	0
4	Coragyps	atratus	S USA S to N,E,&W South America	D		1			> 1 MIL	1	None	LR		None	N	3	1	60
5	Sarcorhamphus	papa	C Mexico to N Argentina, Trinidad	D		1			?		L	LR		Lh	N	3	1	155
6	Gymnogyps	californianus	S California	A		1			?		H,Pu, Ps,Pl, Pe	CR	PE, EO, NM	Hm, Lm,O	N	1	1	86
7	Vultur	gryphus	Andes (W Venezuela to Tierra del Fuego)	D		1			?		I,Po,H	VU	PR, PX	Lm, Lh,S, M,O	Y	2	1	148
	Pandionidae																	
8	Pandion	haliaetus	Scandinavia to Japan; Mediterranean; Labrador W to Alaska, S to Florida and Arizona; Caribbean	D		>2			5,000-<10,000	1/2	Ps,L,H	LR		Hm,M, Lm	N	NO	2/3	7

LN #	TAXON		WILD POPULATION													CAP POP		
	Species		Range	Ext Occ	Area Occ	# Loc	%Decl	Yr/ Gn	Pop #	DQ	Thrts	IUCN	Criter Used	Res Mgmt Recs	PHV A	Cap Rec	Diff	ISIS Cap N
	Accipitridae																	
9	Aviceda	cuculoides	C Southern Africa	D		1			?		L,P	LR		Hm,S	N	NO	2/3	0
10	Aviceda	madagascariensis	Madagascar	D		1			?		L,Lf?	VU?	PX	S,M, Lh,Lr, Lm	P	P	2/3	0
11	Aviceda	jerdoni	SE India, Philippines, Malay Peninsula	D		≥ 6			?		L,Lf	VU?	PX	S,M, Lr,Lm	P	P	2/3	0
12	Aviceda	subcristata	Indonesia, New Guinea, N&NE coast Australia	D		≥ 4			?		Po	LR		T,S,M, Lm	N	NO	2/3	4
13	Aviceda	leuphotes	SW India, S Burma, W Thailand, NE India E to S China	D		≥ 2			?		L,Lf	VU?	PX, EO	T,S,M, Hm,Lr, Lm	P	NO	2/3	0
14	Leptodon	cayanensis	EC Mexico to N Argentina, Trinidad	D		1			?		L	LR		S,M, Hm	N	NO	2/3	0
15	Leptodon	forbesi	NE Brazil	B		1			?		L	EN	EO	S,M, Hm,Lr, Lh,Lm	Y	P	2/3	0
16	Chondrohierax	uncinatus	S Texas to N Argentina	D		≥ 3			?		L,Ice	LR		S,M, Lm	Y	P	2/3	0
17	Henicopernis	longicauda	New Guinea Is, W Papuan Is, Aru Is	D		3			?		H,L	LR		S,Lh, Lm, Hm	N	NO	2/3	0

LN #	TAXON		WILD POPULATION													CAP POP		
	Species		Range	Ext Occ	Area Occ	# Loc	%Decl	Yr/ Gn	Pop #	DQ	Thrts	IUCN	Criter Used	Res Mgmt Recs	PHV A	Cap Rec	Diff	ISIS Cap N
18	Henicopernis	infuscatus	New Britain	C		1			?		L,Lf	VU	EO, PX	S,M, Hm, Lm,Lh	P	P	2/3	0
19	Pernis	apivorus	Europe, N Asia - Africa	D		≥ 5			>200,000	1	H,Ps	LR		M	N	3	2/3	1

APPENDIX V.
BLANK MAMMALIAN TAXON DATA SHEET

SPECIES:
STATUS: IUCN:
Criteria based on:
CITES:

Taxonomic status:

Current Distribution:

Historical Distribution:
Extent of Occurrence:
Area Occupied:
Number of Locations:

Population Trends - % Change in Years or Generations:
Trend over past 100 years:
Generation Time:

World Population:
Regional Population(s):
Data Quality:

Recent Field Studies:

Threats:

Trade:

Comments:

Recommendations:
Research Management:
PHVA:

Captive Program Recommendation:
Level of Difficulty:
Existing Captive Population (ISIS):
Sources:
Compilers:

APPENDIX VI.
BLANK AVIAN TAXON DATA SHEET

SPECIES:
STATUS: IUCN:
Criteria based on:
CITES:

Taxonomic status:

Current Distribution (breeding and wintering):
Concentrated Migration Regions:
Historical Distribution:
Extent of Occurrence:
Area Occupied:
Number of Locations:

Population Trends - % Change in Years or Generations:
Trend over past 100 years:
Generation Time:

World Population:
Regional Population(s):
Data Quality:

Recent Field Studies:

Threats:

Trade:

Comments:

Recommendations:
Research Management:
PHVA:

Captive Program Recommendation:
Level of Difficulty:
Existing Captive Population (ISIS):
Sources:
Compilers:

APPENDIX VII.
BLANK PLANT TAXON DATA SHEET

SPECIES:
Taxonomic status:

Habit: Habitat:

Distribution;
- Range-km^2:
- Area Occupied-km^2:
- Fragmentation (# subpopulations ?):

Wild Population;
- % Decline:
- Time/Rate (Years or generations):
- # Mature Individuals:

Data Quality, (See key, Sources, Dates):

Field Studies (Who & Dates, Ref.):

Threats:

Trade:

Other Comments:

STATUS: IUCN (Revised):
Criteria based on:
CITES:

Recommendations:
- PHVA:
- Research management (Code):
- Cultivation Program:
- Genetic Management:

Cultivated Population (Current Status & Locations & Difficulty):
- Botanical Gardens:
- Commercial/Domestic:
- Herbaria (or Seed banks):

Sources:
Compilers:

APPENDIX VIII. BLANK VERTEBRATE CAMP SPREADSHEET

LN #	TAXON		WILD POPULATION													CAP POP		
	Species		Range	Ext Occ	Area Occ	# Loc	%Decl	Yr/ Gn	Pop #	DQ	Thrts	Tent IUCN	Criter Used	Res Mgmt Recs	PHV A	Cap Rec	Diff	ISIS Cap N
1																		
2																		
3																		
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LN #	TAXON		WILD POPULATION													CAP POP		
	Species		Range	Ext Occ	Area Occ	# Loc	%Decl	Yr/ Gn	Pop #	DQ	Thrts	Tent IUCN	Criter Used	Res Mgmt Recs	PHV A	Cap Rec	Diff	ISIS Cap N
21																		
22																		
23																		
24																		
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APPENDIX IX. BLANK PLANT CAMP SPREADSHEET

#	Species	Location	Habitat	Family	Area	Occup	Locs	%Decl	Yr/Gn	Pop #	Qual	Threat	IUCN	Criter	Recs	Cap N
1																
2																
3																
4																
5																
6																
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#	Species	Location	Habitat	Family	Area	Occup	Locs	%Decl	Yr/Gn	Pop #	Qual	Threat	IUCN	Criter	Recs	Cap N
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24																
25																
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Conservation Assessment and Management Plan (CAMP) Process

Reference Manual

Edited by
Susie Ellis and Ulysses S. Seal

SECTION 3
INFORMATION FOR CAMP ORGANIZERS:
CAMP PREPARATION AND DOCUMENTATION NEEDS

CAMP Preparation and Documentation Needs for Process Organizers

Dates and Location

CAMP processes generally take place over a full three- or three-and-one-half day period, including evenings. Because CBSG's schedule is usually filled up to one year in advance, it is essential that the host/organizer contact the CBSG Chairman or Office far in advance to make arrangements for the process dates. Each CAMP is assigned to a specific CBSG Program Officer who will be the organizer's primary contact for the process and its arrangements.

Appropriate Specialist Group Chairs also should be consulted. Often, there are special interest group meetings or conferences which many potential participants may plan to attend. It is advisable to take advantage of these opportunities by arranging CAMP process dates in close proximity and/or in the same location so that attendance and participation can be maximized. Participants should plan on arriving the day before the CAMP begins and departing on the fourth day.

Living quarters and food for the three days should be arranged at a location that minimizes outside distractions. Participants are usually responsible for their own lodging expenses and meals. Most hosts/organizers provide coffee and other beverages and light snacks *ad libitum* during the process, with lunches brought in to minimize loss of momentum.

Invitations to the CAMP Process

Invitations are generally prepared and mailed by the host/organizer unless other arrangements have been made with CBSG. A sample invitation is included as Appendix I, this section. Ideally, invitations should be in the mail at least six to twelve months prior to the process. The list of invitees to a CAMP is generated by the host/organizer in collaboration with the appropriate SSC or BirdLife International Specialist Group and CBSG. Appropriate invitees may include biologists, Specialist Group members, policy level managers, NGOs that have participated in conservation efforts, zoo animal managers, academic scientists, and other interested parties. Generally, a list of 30-40 individuals is compiled, on the assumption that approximately 15-30 will be able to attend. Observers (up to 20) may be welcome if facilities are available but their arrangements should be their own responsibility. The host/organizer is responsible for securing commitments to participate and for all communication with invitees prior to the CAMP.

Taxonomic Lists

A critical piece of information that must be provided to the CBSG Office as soon as plans are firm is a list of the taxa to be assessed at the CAMP. This list should be at the subspecies level if possible. The most widely accepted taxonomy for the group of concern should be used. For regional CAMPs, lists are needed of all endemic taxa, as well as all taxa listed as threatened within the region.

Briefing Book

For each CAMP meeting, a Briefing Book for participants will be prepared. It is up to the organizer/host to solicit information for this Book. This material should be provided to the CBSG Office in single-sided copies at least three weeks prior to the date of the meeting. Another item needed is a color slide of an endangered representative of the taxon that can be reproduced and use for the cover of the final report (with appropriate credit to the photographer). Information to be included in the briefing book includes:

* any overview material on the taxon or region in question, particularly with reference to conservation or population biology
* any information on wild populations, especially if you can find a regional overview
* any overview material on regional habitat problems that are affecting the taxon or region in question
* disease problems facing this taxonomic group
* taxonomic problems or questions within the group
* any specific environmental parameters that seem to be affecting the group (e.g., pollution, predation, hunting, etc.)
* telemetric work or survey techniques that may be applicable to the taxon or region in question
* information on captive populations
* information ou captive husbandry problems
* a bibliography, preferably as complete as possible and either on disk or in clean copy that we can scan into a computer file (CBSG can sometimes assist with this)
* a list of invitees
* a copy of the invitation to the meeting
* a copy of the meeting agenda

It is important to let the CBSG Office know which organizations should be identified in the Briefing Book as major sponsors or collaborators (e.g., corporate sponsors, the SSC or BirdLife International Specialist Group, individual institutions, the AZA or EEP Taxon Advisory Group, others). We would like to be sure that each gets credit on the title page. The host/organizer will be responsible for obtaining copies of logos from sponsors

and collaborators that can be included in the Briefing Book and final report of the meeting.

Meeting Agenda

The meeting agenda is put together by the host/organizer, with input from the CBSG office and/or the appropriate wildlife agency or Specialist Group Chair. The agenda should be mailed to participants at least 30 days prior to the CAMP, if possible. Usually, there are several presentations on the first morning providing an overview of the general status of the taxonomic group or region (re: conservation status and general threats), as well as a few specific presentations chosen by the organizing Specialist Group, when applicable. Presenters at these sessions should be given plenty of notice concerning the presentations so that they have adequate time to prepare. These presentations are followed by general presentations by CBSG staff on the CAMP process, and then by the organization of Working Groups to review the taxonomic groups or regions coinciding with their expertise. Working Groups report to the larger groups of participants several times during the course of the process; participants work to reach consensus on assessments and recommendations prior to the process' end. A sample agenda is included as Appendix II in this section.

Equipment and Meeting Room Needs

Meeting facilities should include a meeting room for the group, with break away areas or rooms, that also can be used during evenings. The 'must-haves' are: a slide projector and carousel (generally for the first day only), a parallel port IBM compatible laser printer (preferably in the meeting room or in an adjacent location), black or whiteboard, 4-8 flip charts and pens, tape, access to xeroxing (for up to 400 pages per day), and as many IBM-compatible laptops or desktop computers as possible. CBSG uses WordPerfect 5.1 or 6.0 for documents. CBSG staff bring at least one computer to CAMPs, but it is best if 4-5 total are available for participants to use during working group sessions. Adequate electrical outlets also should be provided.

After the CAMP

CBSG staff generally plan to stay on-site for at least two days following a CAMP. This time is spent drafting the preliminary participants' report so that distribution of the meeting results is expedited. Access to computers, a laser printer, and copying facilities is essential during this period. It is important that two-three participants with a good sense of the overall scope of the problem facing the taxon or region work with CBSG staff on this draft at this time. The host/organizer should identify these individuals, in collaboration with the appropriate wildlife agency or Specialist Group Chair (when applicable).

CBSG generally will take responsibility for printing and distribution of the participants' first draft. This is distributed to a number of volunteer editors who work with the CBSG Program

staff to refine the document. These editors usually are given up to four weeks to make comments on this initial draft. After these comments are incorporated into a working draft version, CAMP documents are distributed to a broader audience including all participants, field biologists, academics, wildlife managers, captive managers, and other interested parties. Subsequent comments are incorporated into revised drafts as they are printed.

Funding

Funding is needed primarily for travel and per diem during the CAMP, preparation of the briefing document and the CAMP report, communications and some personnel costs. CBSG costs are for preparation of the documents, completions of the report after the meeting, travel of 2-4 people, and their per diem. We estimate that CBSG's costs for each CAMP are $10,000 to $18,000 depending on the amount of work required beforehand as well as after the process in completion of the report.

APPENDIX I.

SAMPLE CAMP INVITATION

Date

Name, Address

Dear :

It is our pleasure to invite you to participate in a Conservation Assessment and Management Plan (CAMP) process for [TAXONOMIC GROUP AND/OR REGION]. This process will be hosted by the [HOST ORGANIZATION] in [CITY, STATE, COUNTRY] from [DATE to DATE], and will be held at [NAME OF FACILITY], [ADDRESS OF FACILITY]. The CAMP will begin at 9:00 a.m. on [DAY AND DATE].

This process will be held in collaboration with the IUCN/Species Survival Commission's Conservation Breeding Specialist Group. The goal of the CAMP will be to facilitate an integrated approach to the management of [TAXONOMIC GROUP AND/OR REGION] for conservation, examining each taxon in the group, one by one, and providing strategic guidance for the application of intensive management techniques that are increasingly required for survival and recovery of threatened taxa. Enclosed please find background information that explains in a little more detail the process that the process will entail.

We will look forward to seeing you in [LOCATION]!

Sincerely,

[NAME]
[ORGANIZATION AND POSITION]

enclosure: CAMP background materials [SECTION 1 OF THIS MANUAL]

APPENDIX II.

SAMPLE CAMP PROCESS AGENDA

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN (CAMP) FOR [TAXONOMIC GROUP AND/OR REGION]

[DATE]

09:00 Welcome, introductions, and opening remarks

Overview of conservation and status of [TAXONOMIC GROUP AND/OR REGION]
(e.g., summary of wild populations and their habitats, current threats, conservation measures, and human impacts) - [NAMES]

Introduction to the CAMP process - [CBSG STAFF]

Organization of working groups - [CBSG STAFF]

Lunch

Working Group Sessions

Dinner

Re-convene Working Groups if needed

[DATE]

08:30 Plenary session discussion

Continuation of Working Groups

Lunch

Continuation of Working Groups

Dinner

Reconvene working groups if needed

[DATE]

08:30 Plenary session discussion and working group reports

Continuation of Working Groups

Lunch

Continuation of Working Groups

Working Group Reports

4:00 Wrap-up discussion

5:00 Finalization of CAMP spreadsheets and taxon sheets for draft report

Conservation Assessment and Management Plan (CAMP) Process

Reference Manual

Edited by
Susie Ellis and Ulysses S. Seal

SECTION 4

IUCN RED LIST REFERENCE

IUCN RED LIST CATEGORIES

Prepared by the

IUCN Species Survival Commission

As approved by the
40th Meeting of the IUCN Council
Gland, Switzerland

30 November 1994

IUCN RED LIST CATEGORIES

I) Introduction

1. The threatened species categories now used in Red Data Books and Red Lists have been in place, with some modification, for almost 30 years. Since their introduction these categories have become widely recognized internationally, and they are now used in a whole range of publications and listings, produced by IUCN as well as by numerous governmental and non-governmental organizations. The Red Data Book categories provide an easily and widely understood method for highlighting those species under higher extinction risk, so as to focus attention on conservation measures designed to protect them.

2. The need to revise the categories has been recognized for some time. In 1984, the SSC held a symposium, 'The Road to Extinction' (Fitter & Fitter 1987), which examined the issues in some detail, and at which a number of options were considered for the revised system. However, no single proposal resulted. The current phase of development began in 1989 with a request from the SSC Steering Committee to develop a new approach that would provide the conservation community with useful information for action planning.

In this document, proposals for new definitions for Red List categories are presented. The general aim of the new system is to provide an explicit, objective framework for the classification of species according to their extinction risk.

The revision has several specific aims:

- to provide a system that can be applied consistently by different people;
- to improve the objectivity by providing those using the criteria with clear guidance on how to evaluate different factors which affect risk of extinction;
- to provide a system which will facilitate comparisons across widely different taxa;
- to give people using threatened species lists a better understanding of how individual species were classified.

3. The proposals presented in this document result from a continuing process of drafting, consultation and validation. It was clear that the production of a large number of draft proposals led to some confusion, especially as each draft has been used for classifying some set of species for conservation purposes. To clarify matters, and to open the way for modifications as and when they became necessary, a system for version numbering was applied as follows:

Version 1.0: Mace & Lande (1991)
The first paper discussing a new basis for the categories, and presenting numerical criteria especially relevant for large vertebrates.

Version 2.0: Mace et al. (1992)
A major revision of Version 1.0, including numerical criteria appropriate to all organisms and introducing the non-threatened categories.

Version 2.1: IUCN (1993)

Following an extensive consultation process within SSC, a number of changes were made to the details of the criteria, and fuller explanation of basic principles was included. A more explicit structure clarified the significance of the non-threatened categories.

Version 2.2: Mace & Stuart (1994)

Following further comments received and additional validation exercises, some minor changes to the criteria were made. In addition, the Susceptible category present in Versions 2.0 and 2.1 was subsumed into the Vulnerable category. A precautionary application of the system was emphasized.

Final Version

This final document, which incorporates changes as a result of comments from IUCN members, was adopted by the IUCN Council in December 1994.

All future taxon lists including categorizations should be based on this version, and not the previous ones.

4. In the rest of this document the proposed system is outlined in several sections. The Preamble presents some basic information about the context and structure of the proposal, and the procedures that are to be followed in applying the definitions to species. This is followed by a section giving definitions of terms used. Finally the definitions are presented, followed by the quantitative criteria used for classification within the threatened categories. It is important for the effective functioning of the new system that all sections are read and understood, and the guidelines followed.

References:

Fitter, R., and M. Fitter, ed. (1987) The Road to Extinction. Gland, Switzerland: IUCN.

IUCN. (1993) Draft IUCN Red List Categories. Gland, Switzerland: IUCN.

Mace, G. M. et al. (1992) 'The development of new criteria for listing species on the IUCN Red List.' Species 19: 16-22.

Mace, G. M., and R. Lande. (1991) "Assessing extinction threats: toward a reevaluation of IUCN threatened species categories." Conserv. Biol. 5.2: 148-157.

Mace, G. M. & S. N. Stuart. (1994) "Draft IUCN Red List Categories, Version 2.2". Species 21-22: 13-24.

II) Preamble

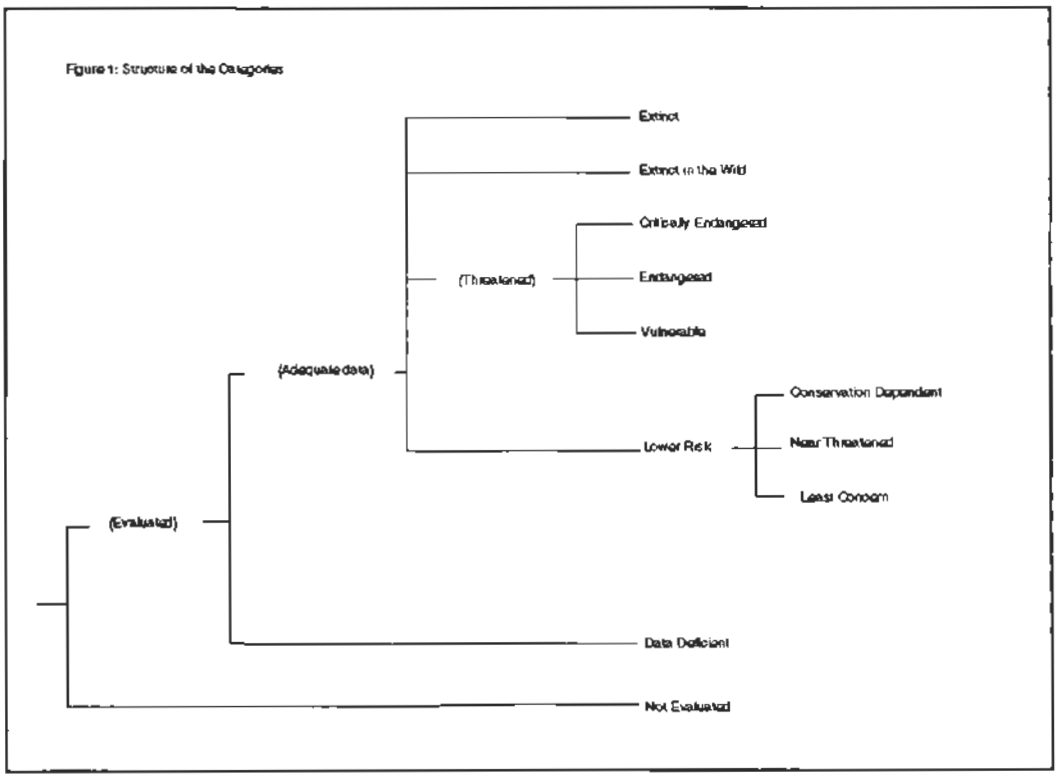
The following points present important information on the use and interpretation of the categories (= Critically Endangered, Endangered, etc.), criteria (= A to E), and sub-criteria (= a,b etc., i,ii etc.):

1. Taxonomic level and scope of the categorization process

The criteria can be applied to any taxonomic unit at or below the species level. The term 'taxon' in the following notes, definitions and criteria is used for convenience, and may represent species or lower taxonomic levels, including forms that are not yet formally described. There is a sufficient range among the different criteria to enable the appropriate listing of taxa from the complete taxonomic spectrum, with the exception of micro-organisms. The criteria may also be applied within any specified geographical or political area although in such cases special notice should be taken of point 11 below. In presenting the results of applying the criteria, the taxonomic unit and area under consideration should be made explicit. The categorization process should only be applied to wild populations inside their natural range, and to populations resulting from benign introductions (defined in the draft IUCN Guidelines for Re-introductions as "..an attempt to establish a species, for the purpose of conservation, outside its recorded distribution, but within an appropriate habitat and eco-geographical area").

2. Nature of the categories

All taxa listed as Critically Endangered qualify for Vulnerable and Endangered, and all listed as Endangered qualify for Vulnerable. Together these categories are described as 'threatened'. The threatened species categories form a part of the overall scheme. It will be possible to place all taxa into one of the categories (see Figure 1).



3. Role of the different criteria

For listing as Critically Endangered, Endangered or Vulnerable there is a range of quantitative criteria; meeting any one of these criteria qualifies a taxon for listing at that level of threat. Each species should be evaluated against all the criteria. The different criteria (A-E) are derived from a wide review aimed at detecting risk factors across the broad range of organisms and the diverse life histories they exhibit. Even though some criteria will be inappropriate for certain taxa(some taxa will never qualify under these however close to extinction they come), there should be criteria appropriate for assessing threat levels for any taxon (other than micro-organisms). The relevant factor is whether any one criterion is met, not whether all are appropriate or all are met. Because it will never be clear which criteria are appropriate for a particular species in advance, each species should be evaluated against all the criteria, and any criterion met should be listed.

4. Derivation of quantitative criteria

The quantitative values presented in the various criteria associated with threatened categories were developed through wide consultation and they are set at what are generally judged to be appropriate levels, even if no formal justification for these values exists. The levels for different criteria within categories were set independently but against a common standard. Some broad consistency between them was sought. However, a given taxon should not be expected to meet all criteria (A-E) in a category; meeting any one criterion is sufficient for listing.

5. Implications of listing

Listing in the categories of Not Evaluated and Data Deficient indicates that no assessment of extinction risk has been made, though for different reasons. Until such time as an assessment is made, species listed in these categories should not be treated as if they were non-threatened, and it may be appropriate (especially for Data Deficient forms) to give them the same degree of protection as threatened taxa, at least until their status can be evaluated.

Extinction is assumed here to be a chance process. Thus, a listing in a higher extinction risk category implies a higher expectation of extinction, and over the time-frames specified more taxa listed in a higher category are expected to go extinct than in a lower one (without effective conservation action). However, the persistence of some taxa in high risk categories does not necessarily mean their initial assessment was inaccurate.

6. Data quality and the importance of inference and projection

The criteria are clearly quantitative in nature. However, the absence of high quality data should not deter attempts at applying the criteria, as methods involving estimation, inference and projection are emphasized to be acceptable throughout. Inference and projection may be based on extrapolation of current or potential threats into the future (including their rate of change), or of factors related to population abundance or distribution (including dependence on other taxa), so long as these can reasonably be supported. Suspected or inferred patterns in either the recent past, present or near future can be based on any of a series of related factors, and these factors should be specified.

Taxa at risk from threats posed by future events of low probability but with severe consequences (catastrophes) should be identified by the criteria (e.g. small distributions, few locations). Some threats need to be identified particularly early, and appropriate actions taken, because their effects are irreversible, or nearly so (pathogens, invasive organisms, hybridization).

7. Uncertainty

The criteria should be applied on the basis of the available evidence on taxon numbers, trend and

distribution, making due allowance for statistical and other uncertainties. Given that data are rarely available for the whole range or population of a taxon, it may often be appropriate to use the information that is available to make intelligent inferences about the overall status of the taxon in question. In cases where a wide variation in estimates is found, it is legitimate to apply the precautionary principle and use the estimate (providing it is credible) that leads to listing in the category of highest risk.

Where data are insufficient to assign a category (including Lower Risk), the category of 'Data Deficient' may be assigned. However, it is important to recognize that this category indicates that data are inadequate to determine the degree of threat faced by a taxon, not necessarily that the taxon is poorly known. In cases where there are evident threats to a taxon through, for example, deterioration of its only known habitat, it is important to attempt threatened listing, even though there may be little direct information on the biological status of the taxon itself. The category 'Data Deficient' is not a threatened category, although it indicates a need to obtain more information on a taxon to determine the appropriate listing.

8. **Conservation actions in the listing process**

The criteria for the threatened categories are to be applied to a taxon whatever the level of conservation action affecting it. In cases where it is only conservation action that prevents the taxon from meeting the threatened criteria, the designation of 'Conservation Dependent' is appropriate. It is important to emphasize here that a taxon require conservation action even if it is not listed as threatened.

9. **Documentation**

All taxon lists including categorization resulting from these criteria should state the criteria and sub-criteria that were met. No listing can be accepted as valid unless at least one criterion is given. If more than one criterion or sub-criterion was met, then each should be listed. However, failure to mention a criterion should not necessarily imply that it was not met. Therefore, if a re-evaluation indicates that the documented criterion is no longer met, this should not result in automatic down-listing. Instead, the taxon should be re-evaluated with respect to all criteria to indicate its status. The factors responsible for triggering the criteria, especially where inference and projection are used, should at least be logged by the evaluator, even if they cannot be included in published lists.

10. **Threats and priorities**

The category of threat is not necessarily sufficient to determine priorities for conservation action. The category of threat simply provides an assessment of the likelihood of extinction under current circumstances, whereas a system for assessing priorities for action will include numerous other factors concerning conservation action such as costs, logistics, chances of success, and even perhaps the taxonomic distinctiveness of the subject.

11. **Use at regional level**

The criteria are most appropriately applied to whole taxa at a global scale, rather than to those units defined by regional or national boundaries. Regionally or nationally based threat categories, which are aimed at including taxa that are threatened at regional or national levels (but not necessarily throughout their global ranges), are best used with two key pieces of information: the global status category for the taxon, and the proportion of the global population or range that occurs within the region or nation. However, if applied at regional or national level it must be recognized that a global category of threat may not be the same as a regional or national category for a particular taxon. For example, taxa classified as Vulnerable on the basis of their global declines in numbers or range might be Lower Risk within a particular region where their populations are stable. Conversely, taxa classified as Lower Risk globally might be Critically Endangered within a particular region where numbers are very small or declining,

perhaps only because they are at the margins of their global range. IUCN is still in the process of developing guidelines for the use of national red list categories.

12. **Re-evaluation**
Evaluation of taxa against the criteria should be carried out at appropriate intervals. This is especially important for taxa listed under Near Threatened, or Conservation Dependent, and for threatened species whose status is known or suspected to be deteriorating.

13. **Transfer between categories**
There are rules to govern the movement of taxa between categories. These are as follows: (A) A taxon may be moved from a category of higher threat to a category of lower threat if none of the criteria of the higher category has been met for 5 years or more. (B) If the original classification is found to have been erroneous, the taxon may be transferred to the appropriate category or removed from the threatened categories altogether, without delay (but see Section 9). (C) Transfer from categories of lower to higher risk should be made without delay.

14. **Problems of scale**
Classification based on the sizes of geographic ranges or the patterns of habitat occupancy is complicated by problems of spatial scale. The finer the scale at which the distributions or habitats of taxa are mapped, the smaller will be the area that they are found to occupy. Mapping at finer scales reveals more areas in which the taxon is unrecorded. It is impossible to provide any strict but general rules for mapping taxa or habitats; the most appropriate scale will depend on the taxa in question, and the origin and comprehensiveness of the distributional data. However, the thresholds for some criteria (e.g. Critically Endangered) necessitate mapping at a fine scale.

III) Definitions

1. **Population**
Population is defined as the total number of individuals of the taxon. For functional reasons, primarily owing to differences between life-forms, population numbers are expressed as numbers of mature individuals only. In the case of taxa obligately dependent on other taxa for all or part of their life cycles, biologically appropriate values for the host taxon should be used.

2. **Subpopulations**
Subpopulations are defined as geographically or otherwise distinct groups in the population between which there is little exchange (typically one successful migrant individual or gamete per year or less).

3. **Mature individuals**
The number of mature individuals is defined as the number of individuals known, estimated or inferred to be capable of reproduction. When estimating this quantity the following points should be borne in mind:

- Where the population is characterized by natural fluctuations the minimum number should be used.

- This measure is intended to count individuals capable of reproduction and should therefore exclude individuals that are environmentally, behaviorally or otherwise reproductively suppressed in the wild.

- In the case of populations with biased adult or breeding sex ratios it is appropriate to use lower

estimates for the number of mature individuals which take this into account (e.g. the estimated effective population size).

- Reproducing units within a clone should be counted as individuals, except where such units are unable to survive alone (e.g. corals).

- In the case of taxa that naturally lose all or a subset of mature individuals at some point in their life cycle, the estimate should be made at the appropriate time, when mature individuals are available for breeding.

4. **Generation**

Generation may be measured as the average age of parents in the population. This is greater than the age at first breeding, except in taxa where individuals breed only once.

5. **Continuing decline**

A continuing decline is a recent, current or projected future decline whose causes are not known or not adequately controlled and so is liable to continue unless remedial measures are taken. Natural fluctuations will not normally count as a continuing decline, but an observed decline should not be considered to be part of a natural fluctuation unless there is evidence for this.

6. **Reduction**

A reduction (criterion A) is a decline in the number of mature individuals of at least the amount (%) stated over the time period (years) specified, although the decline need not still be continuing. A reduction should not be interpreted as part of a natural fluctuation unless there is good evidence for this. Downward trends that are part of natural fluctuations will not normally count as a reduction.

7. **Extreme fluctuations**

Extreme fluctuations occur in a number of taxa where population size or distribution area varies widely, rapidly and frequently, typically with a variation greater than one order of magnitude (i.e., a tenfold increase or decrease).

8. **Severely fragmented**

Severely fragmented is refers to the situation where increased extinction risks to the taxon result from the fact that most individuals within a taxon are found in small and relatively isolated subpopulations. These small subpopulations may go extinct, with a reduced probability of recolonization.

9. **Extent of occurrence**

Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy. This measure may exclude discontinuities or disjunctions within the overall distributions of taxa (e.g., large areas of obviously unsuitable habitat) (but see 'area of occupancy'). Extent of occurrence can often be measured by a minimum convex polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).

10. **Area of occupancy**

Area of occupancy is defined as the area within its 'extent of occurrence' (see definition) which is occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may, for example, contain unsuitable habitats. The

area of occupancy is the smallest area essential at any stage to the survival of existing populations of a taxon (e.g. colonial nesting sites, feeding sites for migratory taxa). The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relevant biological aspects of the taxon. The criteria include values in km^2, and thus to avoid errors in classification, the area of occupancy should be measured on grid squares (or equivalents) which are sufficiently small (see Figure 2).

11. Location

Location defines a geographically or ecologically distinct area in which a single event (e.g. pollution) will soon affect all individuals of the taxon present. A location usually, but not always, contains all or part of a subpopulation of the taxon, and is typically a small proportion of the taxon's total distribution.

12. Quantitative analysis

A quantitative analysis is defined here as the technique of population viability analysis (PVA), or any other quantitative form of analysis, which estimates the extinction probability of a taxon or population based on the known life history and specified management or non-management options. In presenting the results of quantitative analyses the structural equations and the data should be explicit.

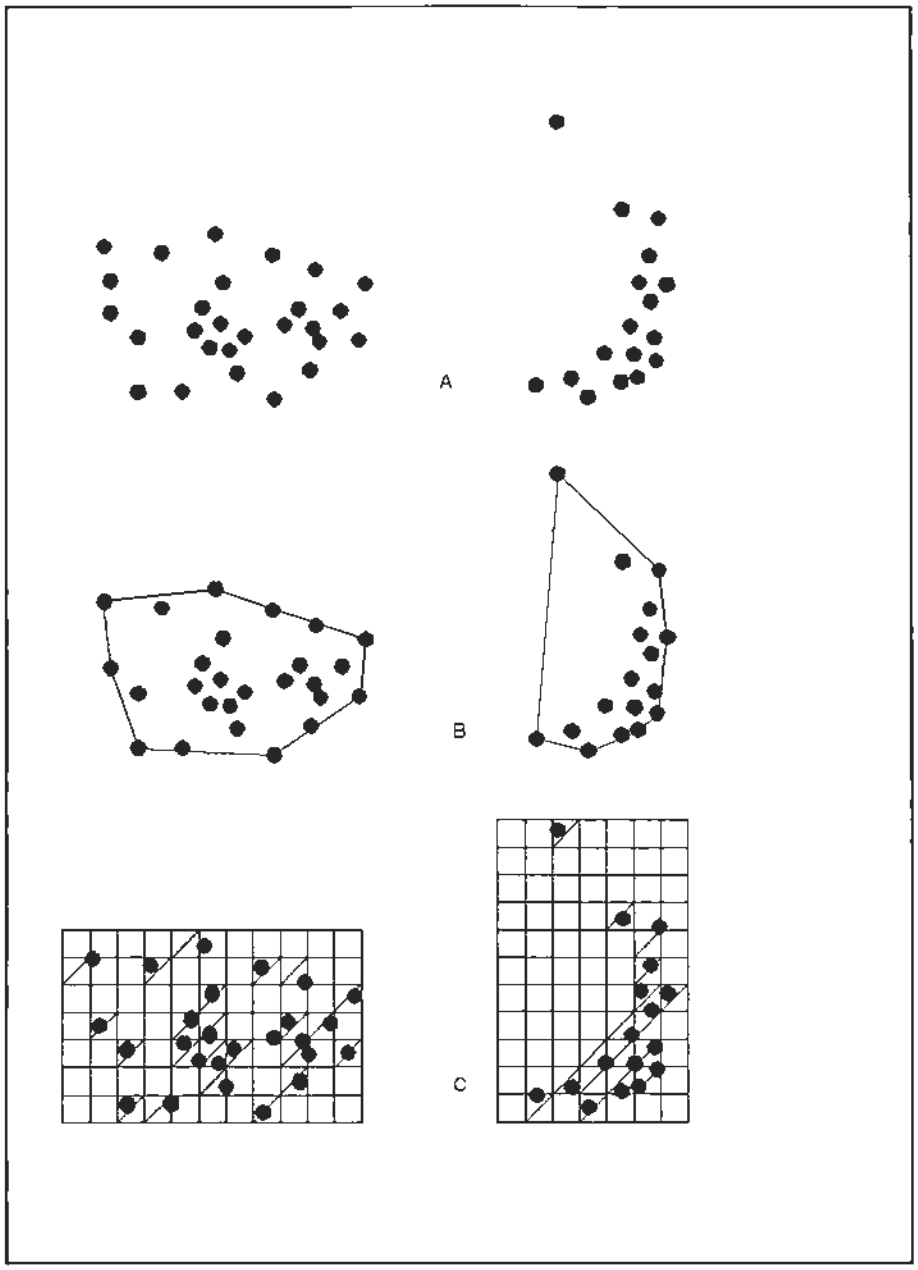


Figure 2:

Two examples of the distinction between extent of occurrence and area of occupancy. (a) is the spatial distribution of known, inferred or projected sites of occurrence. (b) shows one possible boundary to the extent of occurrence, which is the measured area within this boundary. (c) shows one measure of area of

occupancy which can be measured by the sum of the occupied grid squares.

IV) The categories [1]

EXTINCT (EX)
A taxon is Extinct when there is no reasonable doubt that the last individual has died.

EXTINCT IN THE WILD (EW)
A taxon is Extinct in the wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the criteria (A to E) on pages 12 and 13.

ENDANGERED (EN)
A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the criteria (A to E) on pages 14 and 15.

VULNERABLE (VU)
A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the criteria (A to D) on pages 16 and 17.

LOWER RISK (LR)
A taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:

1. **Conservation Dependent (cd).** Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation program targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.

2. **Near Threatened (nt).** Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.

3. **Least Concern (lc).** Taxa which do not qualify for Conservation Dependent or Near Threatened.

DATA DEFICIENT (DD)

Note: As in previous IUCN categories, the abbreviation of each category (in parenthesis) follows the English denominations when translated into other languages.

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution is lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and threatened status. If the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

NOT EVALUATED (NE)
A taxon is Not Evaluated when it is has not yet been assessed against the criteria.

V) The Criteria for Critically Endangered, Endangered and Vulnerable

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 80% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

a) direct observation
b) an index of abundance appropriate for the taxon
c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
d) actual or potential levels of exploitation
e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 80%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B) Extent of occurrence estimated to be less than 100 km^2 or area of occupancy estimated to be less than 10 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at only a single location.

2) Continuing decline, observed, inferred or projected, in any of the following:

a) extent of occurrence
b) area of occupancy
c) area, extent and/or quality of habitat
d) number of locations or subpopulations
e) number of mature individuals.

3) Extreme fluctuations in any of the following:

a) extent of occurrence
b) area of occupancy
c) number of locations or subpopulations
d) number of mature individuals.

C) Population estimated to number less than 250 mature individuals and either:

1) An estimated continuing decline of at least 25% within 3 years or one generation, whichever is longer or

2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

a) severely fragmented (i.e. no subpopulation estimated to contain more than 50 mature individuals)
b) all individuals are in a single subpopulation.

D) Population estimated to number less than 50 mature individuals.

E) Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or 3 generations, whichever is the longer.

ENDANGERED (EN)

A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 50% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

a) direct observation
b) an index of abundance appropriate for the taxon
c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
d) actual or potential levels of exploitation
e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 50%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d), or (e) above.

B) Extent of occurrence estimated to be less than 5000 km^2 or area of occupancy estimated to be less than 500 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at no more than five locations.

2) Continuing decline, inferred, observed or projected, in any of the following:

   a) extent of occurrence
   b) area of occupancy
   c) area, extent and/or quality of habitat
   d) number of locations or subpopulations
   e) number of mature individuals.

3) Extreme fluctuations in any of the following:

   a) extent of occurrence
   b) area of occupancy
   c) number of locations or subpopulations
   d) number of mature individuals.

C) Population estimated to number less than 2500 mature individuals and either:

1) An estimated continuing decline of at least 20% within 5 years or 2 generations, whichever is longer, or

2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

   a) severely fragmented (i.e. no subpopulation estimated to contain more than 250 mature individuals)
   b) all individuals are in a single subpopulation.

D) Population estimated to number less than 250 mature individuals.

E) Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or 5 generations, whichever is the longer.

VULNERABLE (VU)

A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 20% over the last 10 years or three generations, whichever is the longer,, based on (and specifying) any of the following:

   a) direct observation
   b) an index of abundance appropriate for the taxon
   c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
   d) actual or potential levels of exploitation
   e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 20%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B) Extent of occurrence estimated to be less than 20,000 km^2 or area of occupancy estimated to be less than 2000 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at no more than ten locations.

2) Continuing decline, inferred, observed or projected, in any of the following:

a) extent of occurrence
b) area of occupancy
c) area, extent and/or quality of habitat
d) number of locations or subpopulations
e) number of mature individuals.

3) Extreme fluctuations in any of the following:

a) extent of occurrence
b) area of occupancy
c) number of locations or subpopulations
d) number of mature individuals.

C) Population estimated to number less than 10,000 mature individuals and either:

1) An estimated continuing decline of at least 10% within 10 years or 3 generations, whichever is longer, or

2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

a) severely fragmented (i.e. no subpopulation estimated to contain more than 1000 mature individuals)
b) all individuals are in a single subpopulation.

D) Population very small or restricted in the form of either of the following:

1) Population estimated to number less than 1000 mature individuals.

2) Population is characterized by an acute restriction in its area of occupancy (typically less than 100 km^2) or in the number of locations (typically less than 5). Such a taxon would thus be prone to the effects of human activities (or stochastic events whose impact is increased by human activities) within a very short period of time in an unforeseeable future, and is thus capable of becoming Critically Endangered or even Extinct in a very short period.

E) Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.