



Analysis of the listing of species as endangered or threatened under the Endangered Species Act
by Andrea L Easter-Pilcher

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in
Biological Sciences

Montana State University

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Abstract:

The Endangered Species Act of 1973 (Act) was sweeping in its purpose of mandating protection and conservation for endangered and threatened species and the ecosystems upon which they depend. Two decades later we recognize a breach between the promise of these mandates and the reality of implementation.

Behavior of the United States Fish & Wildlife Service (Service) in implementing the Act was examined. Specifically, an investigation was conducted to determine whether an objective and consistent methodology is implicit in the selection of species to list as endangered or threatened (Chapter 1). The priority guidelines criteria for selecting candidate species for listing consideration; and for selecting listed species for recovery efforts were also examined (Chapter 2).

Chapter 1: Federal Register (FR) final rules for four classes of animals [mammals (n=119), birds (n=39), fish (n=60), and reptiles (n=54)] listed from January 1, 1975 -June 21, 1991 were examined. All biological information reported in the FR and pertinent to the listing decisions were compiled and analyzed.

An abundance of missing data was found throughout the final listings. Variables (biological criteria) were not defined and were inconsistently used (both across classes and within classes) by the Service. Descriptive variable categories were not defined relative to each other and did not correlate with related quantitative variable values. There were no clearly defined biological thresholds distinguishing endangered species from threatened species. A jackknifed discriminant analysis of all variables misclassified 96 of the 272 listed species examined.

Chapter 2: Priority guidelines criteria for selecting petitioned and candidate species to consider for listing, and for selecting listed species for recovery actions were examined. The author found that the criteria, as set forth in the guidelines, are not specific enough to allow for objective and equitable ranking of species for listing consideration and recovery actions.

Systematic consideration of biological, objective, and defined criteria would significantly improve the scientific validity and the effectiveness of the listing process.

ANALYSIS OF THE LISTING OF SPECIES AS ENDANGERED OR
THREATENED UNDER THE ENDANGERED SPECIES ACT

By

Andrea L. Easter-Pilcher

A thesis submitted in partial fulfillment
of the requirements for the degree

of

Doctor of Philosophy

in

Biological Sciences

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This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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This dissertation is dedicated to my daughter, Emily Cady Pilcher. She and children of her generation will inherit the earth. The decisions that we, as scientists and policy makers, effect regarding our natural resources will impact that inheritance. We must be true to ourselves and true to them.

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ABSTRACT

The Endangered Species Act of 1973 (Act) was sweeping in its purpose of mandating protection and conservation for endangered and threatened species and the ecosystems upon which they depend. Two decades later we recognize a breach between the promise of these mandates and the reality of implementation.

Behavior of the United States Fish & Wildlife Service (Service) in implementing the Act was examined. Specifically, an investigation was conducted to determine whether an objective and consistent methodology is implicit in the selection of species to list as endangered or threatened (Chapter 1). The priority guidelines criteria for selecting candidate species for listing consideration; and for selecting listed species for recovery efforts were also examined (Chapter 2).

Chapter 1: Federal Register (FR) final rules for four classes of animals [mammals (n=119), birds (n=39), fish (n=60), and reptiles (n=54)] listed from January 1, 1975 - June 21, 1991 were examined. All biological information reported in the FR and pertinent to the listing decisions were compiled and analyzed.

An abundance of missing data was found throughout the final listings. Variables (biological criteria) were not defined and were inconsistently used (both across classes and within classes) by the Service. Descriptive variable categories were not defined relative to each other and did not correlate with related quantitative variable values. There were no clearly defined biological thresholds distinguishing endangered species from threatened species. A jackknifed discriminant analysis of all variables misclassified 96 of the 272 listed species examined.

Chapter 2: Priority guidelines criteria for selecting petitioned and candidate species to consider for listing, and for selecting listed species for recovery actions were examined. The author found that the criteria, as set forth in the guidelines, are not specific enough to allow for objective and equitable ranking of species for listing consideration and recovery actions.

Systematic consideration of biological, objective, and defined criteria would significantly improve the scientific validity and the effectiveness of the listing process.

DISSERTATION INTRODUCTION

The Endangered Species Act (Act) when signed into law on December 28, 1973 by President Richard Nixon was sweeping in its mandate of protection and conservation of endangered and threatened species and the ecosystems upon which they depend.

The Congress finds and declares that-

(1) various species of fish, wildlife, and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation;

(2) other species of fish, wildlife, and plants have been so depleted in numbers that they are in danger of or threatened with extinction;

(3) these species of fish, wildlife, and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people...The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved....It is further declared to be the policy of Congress that all Federal departments and agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of this Act.¹

Conservation was defined as follows:

The terms conserve, conserving, and conservation mean...the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary.²

Congress also delineated which organisms should be eligible for protection under the Act.

The term fish or wildlife means any member of the animal kingdom, including without limitation any mammal, fish, bird,...amphibian, reptile, mollusk, crustacean, arthropod or other invertebrate....The term plant means any member of the plant kingdom.³

Historical Perspective

The Endangered Species Act of 1973 (Act) reflected the growing involvement of the Federal government in areas of wildlife management which had up until 1900 been the sole responsibility of the states. Evolving national attitudes regarding wildlife management, as reflected in the contents of federal acts passed since 1900, are embodied in the Act.

The Lacey Act (1900) was the first major piece of federal legislation concerning wildlife management. It was an attempt by the government to control interstate commerce in wildlife taken in violation of state law. The Lacey Act was followed in 1918 by the Migratory Bird Treaty Act which recognized both the need for federal acquisition of refuges for migratory birds and also the need to regulate the taking of migratory birds. The passage of the Fish and Wildlife Coordination Act (1934) was an attempt to compel consideration of development impacts on wildlife.

The Endangered Species Protection Act (1966) was the first attempt by the government to introduce legislation which dealt solely with endangered species. Its purpose was to restore, conserve and protect domestic species of fish and wildlife that were believed to be threatened with extinction. The major limitations of the 1966 Act were that it did not extend protection to foreign species, and it did not place any restrictions on the taking of endangered species or restrict

interstate commerce in same. The responsibility for restricting take was left up to the states. Federal agencies were required to protect applicable habitat only "insofar as is practicable and consistent with the primary purposes of such bureaus."⁴

The 1966 Act was replaced in 1969 by the Endangered Species Conservation Act. This Act expanded the scope of species protection to include those species threatened with extinction anywhere worldwide. Importation of such species into the United States was restricted. But, Federal agency requirements to protect applicable habitat remained as in the 1966 Act.

Motivation for passage of the 1973 Act was several-fold. Extension of protection to species that were vulnerable to extinction (threatened) as well as to all phyla of plants and animals was considered essential for successful species preservation (Bean 1983). It was also recognized that the obligation of Federal agencies to avoid adverse impacts on endangered species needed to be more specific (Bean 1983). The Federal government also recognized the need for greater control over the taking of endangered species. The concept of critical habitat was introduced in the 1973 Act. By the 1973 legislation, Federal agency actions were ordered not to modify or destroy critical habitat (Bean 1983).

The Act passed virtually unopposed at a time of high environmental enthusiasm (Yaffee 1982) when the majority of

the country had rallied around the bald eagle, the African elephant and other charismatic fauna. Given the pro-environmental climate of the times, full support of the Act was a safe, indeed even a sound, political move for both the President and members of Congress.

Since 1973, there have been numerous administrative, legislative and litigative attempts (see below) to weaken the mandate of the Act. The courts however, have consistently affirmed that:

the plain language of the Act, buttressed by its legislative history, shows clearly that Congress viewed the value of endangered species as 'incalculable'The plain intent of Congress in enacting this statute was to halt and reverse the trend towards species extinction, whatever the cost.⁵

Today, in a recession-bound economy, the political climate across the country does not match that of 1973. The perceived and real economic and social costs of species and habitat conservation are thought, by many, to be greater than any potential benefit to be derived from that conservation. Legislators from districts which see themselves as impacted economically by endangered species decisions may court political suicide by fully endorsing the Act.

The Act will be considered for reauthorization in the next few months and is drawing fire from all sides. Much criticism of the Act at this important juncture in its history is well intentioned but misplaced.

In the face of...political challenges it is important not to create the erroneous impression that the Act itself is the culprit, an impression that carries the real danger of becoming even more fuel for the fire of those who, claiming the Act 'doesn't work,' would like to scale back its provisions (O'Connell 1992).

We must clearly distinguish the sound statute that is the Act from what has been remarkably ineffective implementation of the same. It is in this spirit that this paper is written.

Dissertation Goals

The goal of this study is to examine the complete set of biological data presented in the final listings and then relate those data to Service listing decisions.

Wilcove, McMillan and Winston (1993) examined recent proposed and final listings of domestic species to determine the composition of these listings in terms of class groups (mammals, birds etc.) and taxonomic level (species, subspecies and populations). They also examined the rarity of these species by assessing the size and number of populations reported (given a numeric value) at the time of listing.

They found that 2%, 18% and 80% of recent listings comprised populations, subspecies, and species respectively. However, this finding was not consistent across classes. The majority of recent listings for mammals and birds were in fact subspecies or populations. They also found that reported population sizes (in FR proposed and final listings) varied significantly in magnitude at the time of listing. They

observed that many species, subspecies, and populations are not listed until their numbers are exceedingly low while other species are listed while there is still a sizeable number of individuals remaining.

Tear, Scott and Hayward (in press) have examined the biological data presented in the recovery plans to determine whether recent criticisms (vertebrate bias, lack of biological information etc.) leveled at those plans are justified. They find a paucity of biological data in the recovery plans and report that the importance of population size and numbers varies widely across taxonomic groups. They suggest that population goals have been set which are not "biologically defensible"...and which "risk management for extinction rather than away from it." Indeed, they report that median population size is substantially lower in revised recovery plans than in the original plans. They recommend, among other things, the incorporation of multiple species and ecosystem level concepts into the recovery plans (see Chapter 2).

This dissertation goes beyond the contribution of Wilcove et al. (1993) and examines the full complement of data (approximately 50 biological variables including population size and numbers) presented in the final listings from 1975 - 1991 for both foreign and domestic species. This complete set of biological data is then related to the FWS decision process of selecting species to list as endangered or threatened (Chapter 1).

Specifically, the data used for assigning species to degree-of-threat categories are analyzed to determine: (1) the scientific basis of the assignments; (2) the objectivity of the assignments; and (3) the consistency and equitability of the assignments across species. Assignment of a species to the category of endangered or threatened can significantly affect that species' level of protection, as well as affect the allocation of discretionary recovery monies under the Act. It is important, therefore, that the assignment of organisms to degree-of-threat categories be objective, scientific, and consistent across species to ensure that those in greatest need of protection and recovery funding receive just that.

The case will be made, based upon a thorough examination of the published record of final listing decisions as well as the law and regulations, that there is little evidence of objective standards against which decisions for selecting species to list as endangered or threatened can be measured.

In addition, this dissertation (Chapter 2) examines the 1983 priority guidelines criteria for selecting candidate and petitioned species to consider for listing and for selecting listed species for recovery actions. The intent of this examination was to determine whether the criteria, as set forth in the guidelines, are specific enough to allow for objective and equitable ranking of species for listing consideration and recovery actions.

Appendix A presents the procedural aspects of the listing process. Appendix B presents a profile of candidate and federally listed species. Appendix B also details delisting and emergency listing actions that have been implemented up through July 15, 1991. Appendix C presents the list of species considered for this study. Appendix D presents comparative histograms for the descriptive variables examined in this study. Appendix E presents a list of the category 3A candidate species (species now thought to be extinct). The data classification form is presented in Appendix F. Appendix G is a data codification form of the abstracted study variables and their categories. And, the original database is presented in Appendix H.

Dissertation Objectives

- (1) Examine the listing results of the ESA from 1973 - 1991;
- (2) Determine whether there is an objective and consistent methodology evident in the behavior of the Service when selecting species to be listed as endangered or threatened;
- (3) Determine whether there are definitive biological differences between circumstances of organisms listed as endangered and organisms listed as threatened;
- (4) Examine the priority guidelines criteria for selecting candidate and petitioned species for listing consideration;
- (5) Examine the priority guidelines criteria for selecting listed species for recovery actions.

...a decision may be rational if it can be tested or 'verified' against criteria or data determined independently and if it satisfies a goal thought, on a *priori* grounds, to be appropriate for that science. The criteria and the data used are supposed to be 'objective' in the sense that they minimize interpretation and judgment so that, at least in principle, anyone who applies the same criteria to the same data will get the same result...(Sagoff 1987).

CHAPTER 1

ANALYSIS OF THE LISTING OF SPECIES AS ENDANGERED OR THREATENED UNDER THE ENDANGERED SPECIES ACT

Introduction

"The key determination from which all other consequences of the Endangered Species Act flow is the determination to list a species as endangered or threatened" (Bean 1983). Yet, there is no set process to guide the decision of whether a species is endangered or threatened (GAO 1989).

Authority to list species as endangered or threatened resides exclusively with the Secretaries of Interior and Commerce (Bean 1983). Implementation of the Act is overseen by the United States Fish & Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS). Regulations issued by these two agencies govern how the Act is officially interpreted, how terms in the Act are defined, and how the Act is brought into play (Rohlf 1991).

Historical Perspective

Evolution of the Criteria

Used to List Species as Endangered or Threatened

With the passage of the 1966 Endangered Species Protection Act (ESPA) the Secretary of Interior (Secretary) was enjoined to publish in the Federal Register (FR) the names of those species threatened with extinction. He was to make that decision upon determining that a "species' existence was endangered because its habitat is threatened with destruction, drastic modification, or severe curtailment, or because of overexploitation, disease, predation, or because of other factors...."⁶ He was required to consult with states which would be affected by the listing and solicit advice from interested parties.

The 1969 Endangered Species Conservation Act (ESCA) required the Secretary to use the "best scientific and commercial information available to him...."⁷ in selecting species to list as endangered. The standard of "best scientific and commercial information available" carried over into the 1973 Endangered Species Act.⁸ The 1973 Act enjoined the Secretary to consider the following factors when considering species for listing as endangered or threatened:

- (1) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (2) Over-utilization for commercial, recreational, scientific, or educational purposes;
- (3) Disease or predation;

- (4) The inadequacy of existing regulatory mechanisms; or
- (5) Other natural or manmade factors affecting continued existence.⁹

Amendment language in 1982 required that the Secretary base a species' listing "solely on the basis of the best scientific and commercial data available."¹⁰ The addition of the word "solely" was intended to ensure that only those factors relating to the biological status of a species would be considered.

The Committee strongly believes that economic considerations have no relevance to determinations regarding the status of species and intends that economic analysis requirements of Executive Order 12291¹¹ do not apply....Applying economic criteria to the analysis of these alternatives and to any phase of the species listing process is applying economics to the determinations made under section 4 of the Act and is specifically rejected by the inclusion of the word "solely" in this legislation.¹²

Conservation Law Foundation v. Watt (cited in Smith 1984) overturned an agency decision on grounds of failure to meet this requirement ("failure to use best scientific knowledge available violates not only procedural requirement, but also substantive mandate").

Degree-of-Threat Categories:
Endangered and Threatened

Just as the Convention on International Trade in Endangered Species of Wild Fauna and Flora did, the 1973 Act established degrees of vulnerability (two) which allowed for differing

levels of protection (Bean 1983). The Act also extended protection to all phyla of plants and animals.

Endangered and threatened species are defined as follows:

Endangered species means any species which is in danger of extinction throughout all or a significant portion of its range. Threatened species means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.¹³

That portion of a species' range which constitutes a "significant portion" remains undefined in the law and in the regulations. Implementing regulations promulgated by the Service give no guidance (Bean 1983). I recognized no readily apparent thresholds which would separate species "in danger of extinction" from those "likely to become endangered." Both definitions imply an element of likelihood of extinction with no statement as to how disparate that likelihood is.

While there are no apparent definitional thresholds to distinguish "endangered" from "threatened" species (an issue which this chapter will examine further) the protective measures of the Act treat the two categories quite differently. Protection of threatened species is at the discretion of the Secretary who determines and implements "such regulations as are necessary and advisable to provide for the conservation of such species."¹⁴ Endangered species receive the full protection of the Act which includes prohibitions on importation into or exportation out of the United States, prohibitions on the taking of any species

within the United States, prohibitions on the taking of any species on the high seas, prohibitions on possessing, prohibitions on selling in interstate commerce or foreign commerce, and prohibitions on transporting or possessing species taken in violation of the Act in interstate or foreign commerce.¹⁵

Listing as endangered or reclassifying from threatened to endangered status affects priorities for recovery plans.

The species with the highest degree of threat have the highest priority for preparing and implementing recovery plans...the high category means extinction is almost certain in the immediate future because of a rapid population decline or habitat...destruction.¹⁶

This statement implies, and has been interpreted as meaning, that species listed as endangered (highest degree of threat) will be given the highest priorities in terms of allocation of resources for development and implementation of recovery plans.¹⁷ For example, the Schaus swallowtail butterfly (reclassified from threatened to endangered) "will benefit by giving increased priority to its recovery needs...."¹⁸

Because the endangered or threatened designation is considered when ranking a species for priority recovery action, it is important that the methods used to establish those levels be plainly understood and consistent (Mace & Lande 1991).

Objectives of Chapter 1

Chapter 1 examines the behavior of the Service in implementing the Act. Specifically, I investigate whether an objective and consistent methodology is implicit in the selection of species to list as endangered or threatened.

The Data

The Endangered Species Act requires that all data pertinent to the listing decisions be presented in the FR final listings.¹⁹ Final listings average 5-6 pages in length and are presented in a standard narrative format in the FR. Data were collected from the FR for all endangered and threatened vertebrates from January 1, 1975 - June 21, 1991. The exceptions to this were those organisms listed on July 14, 1976 for which no data were provided. Final listings made prior to 1975 were not comparable and provided much less information.

Preliminary examination indicated that different biological criteria [variables (*italicized throughout this paper*)] were emphasized depending upon the class of organism (mammals, birds etc.) being considered for listing. Accordingly, species were separated into class-based groups.

Data from the final listings for 96 endangered mammals (of which 6 were marine), 23 threatened mammals (of which 3 were marine), 30 endangered birds, 9 threatened birds, 22

endangered reptiles, 32 threatened reptiles, 31 endangered fish, and 29 threatened fish comprise the database for this paper. Amphibians were not considered in this study because of the small sample size. There were only 7 amphibian listings to be examined. Reclassifications and delistings were not considered. A complete list of the species included in the database can be found in Appendix C.

Methods of Abstraction

Final listings (from the four classes delineated above) were examined, and all biological criteria (variables) apparently pertinent to the listing decision were recorded. This process was repeated twice (a total of three passes through the final listings) to ensure that no piece of information was overlooked.

Many of these variables were considered by the Service across all four classes while others were specific to one, two, or three classes. Several more of these abstracted variables were only used in a single listing (less than 1% use) or in a dozen or fewer listings (less than 5% use). Because of the extremely rare occurrence of these variables in the final listings, they were not included in the database or the analyses. However, these variables provide information regarding use, or lack thereof, of biological criteria by the Service. They are presented in Table 1. Also included in this table is the percent use for each of these variables

Table 1. Percent use within classes for rare variables. Rare variables were reported in less than 5 percent of all final listings and less than 10% of the final listings within each class. Total use = percent of all final listings which reported the variable, num = numeric value only, des = descriptive value only.

Variable	Percent use in final listings				
	Mammals	Birds	Reptiles	Fish	Total Use
Fecundity	1	2	0	2	1
Lambda and/or "r"	0	2	2	0	1
Ne: Effective (num)	0	5	0	0	1
population size (des)		3			
Longevity (num)	0	5		8	4
(des)		5	4		
Sex ratio	0	0	2	0	0.5
Reproductive rate (num)	1	8	0	0	1
Adult mortality (num)	0	5	2	0	1
Age class data (num)	0	5	5	5	3
General class (des)			4	7	2
data: juveniles & adults					
K-selected species	0	0	2	0	0.5
Monogamous	0	8	0	0	1
Clutches/generations per year	0	0	6	2	1
Declining physical fitness	1	0	2	0	1
Home range	3	2	0	0	2
Wide/year around territories	0	5	0	0	1
Carrying capacity	2	5	0	0	1
Pairs supported in future	0	5	0	0	1
Decline in nest numbers (num)	0	2	2	0	1
Individuals/trap effort	4	0	4	5	4
Museum specimens, confirmed sightings, takes over decades	6	0	2	3	4
Basking/observation surveys	2	0	7	2	3
Mark/recapture surveys	0	0	2	0	0.5
Track density surveys	0	0	2	0	0.5
Individuals per hectare/acre	5	5	4	0	4
Percent of catch which is species in question	0	0	0	3	1
Catch to escapement ratio	0	0	0	2	0.5
Ocean harvest rate	0	0	0	2	0.5
TOTAL RECORDS:	119	39	54	60	272

within a class as well as across classes. All of these variables were reported in less than 5% of the 272 listings examined.

Variables included in the database and used for analyses are listed in Table 2. I also included, in the database, six additional variables which provide general information about the listing process. They are as follows: (1) the date of the initial petition and/or status review; (2) the date of the final listing; (3) whether a species had ever been thought to be extinct; (4) whether a species had been considered under emergency rule; (5) whether there are special rules allowing "take" of the species (post-listing); (6) and the major reasons, reported by the Service, for range and/or habitat loss (see Appendix F). These variables are discussed further in the following chapter and appendices.

Of the 51 variables used for the analyses, 5 variables were represented by discrete quantitative data (actual counts and/or quantitative estimates), 32 were represented by descriptive categorical data (qualitative descriptions and/or estimates) and 14 were represented by both discrete quantitative and descriptive categorical data. These latter variables were represented by both data types within single listings as well as across listings. For example, in the final listing for the Baluchistan bear²⁰, *number of endangered or threatened (e/t) individuals remaining* is given as "perhaps

Table 2. Variables abstracted from the Federal Register final listings for mammals, birds, reptiles, and fish from January 1, 1975 - June 21, 1991. Variables were considered by the Service for all four classes unless otherwise indicated by brackets.

Variables

FWS Listed Classification (use accepted taxonomic classification)
 Listed Range & Numbers
 Historic Numbers
 Number of E/T Individuals Remaining
 Number of E/T Populations Remaining
 Smallest Population of Listed Species
 Largest Population of Listed Species
 Population Trend
 Historic Range Lost
 General Habitat Lost
 Litter Number
 Recruitment and/or Reproductive Success
 Infant Mortality
 Persistence Time
 Historic Distribution
 Current Distribution
 Isolation/Contiguity of Populations
 Expectation of Continued Range Loss
 Habitat Specific
 Distribution (status) of Habitat (patchiness etc.)
 Expectation of Continued Habitat Loss
 Forage/Prey Specific
 Status of Forage/Prey
 Past Impact of Catastrophe
 Future Impact of Catastrophe
 Past Impact of Predation by Humans
 Future Impact of Predation by Humans
 Past Impact of Non-exotic Species
 Future Impact of Non-exotic Species
 Past Impact of Exotic Species
 Future Impact of Exotic Species
 Past Impact of Pesticides/Pollution
 Future Impact of Pesticides/Pollution
 Past Impact of Disease
 Future Impact of Disease
 Genetic Problems
 Demographic Stochasticity
 Level of Legal Protection from "Take"
 Effectiveness of Protection from "Take"
 Protection from other Acts
 Unique Habitat
 Current Level of Habitat Protection
 Ecological Association with other E/T or Candidate Species
 Number of Associated E/T & Candidate Species
 Nesting/Spawning Success [birds & fish]
 Primary Reason for Nesting Failure [birds, reptiles & fish]
 Female Age at Maturity [reptiles]
 Number of Active Nests [birds]
 Number of Occupied Tributaries [fish]
 Number of Occupied Drainages [fish]
 Number of Populations Lost [fish]

fewer than 200 individuals." The bear is also described in the listing as being "evidently rare" in numbers.

Variables for which both data types (quantitative and descriptive) were reported (as with the Baluchistan bear above) were separated into these two data types in the database (see Appendices F and H). This was done to prevent information loss and to allow examination of the degree of correlation between the discrete quantitative and the descriptive categorical data values for each of these variables (see results).

Once all the possible apparent biological criteria (variables) had been identified for analysis (see Table 2), I began the task of identifying discrete categories within each descriptive variable which would accurately represent the qualitative, narrative information presented in the final listings.

Distillation of these discrete categories (gradations within each descriptive categorical variable) that would accurately reflect the narrative data presented in the final listings was an iterative process. The Service uses a plethora of undefined or loosely defined biological terms, non-biological terms, phrases and lengthy descriptions to describe the gradations within each such variable. Application of definitions to these terms ran the risk of making false assumptions about the behavior of the Service when selecting species to list as endangered or threatened.

The risk inherent in applying definitions to Service terminology (as mentioned above) is illustrated by the final listing for the Mount Graham red squirrel. The Service reports, in the listing, that the squirrel appears to be common only in scattered patches of the best habitat. However, the total estimate for the number of individuals remaining is reported (in the final listing) to be only 280 individuals in 16 localities. Or, an average of 17 squirrels per locality. This is not what I would define as common. Indeed, I would not have defined a total of 280 individuals remaining as common.

I then did not apply definitions to Service terminology, but simply identified specific "core" terms which were used by the Service throughout the final listings to describe a specific descriptive variable. These core terms became the basis for the discrete categories for that descriptive variable (see Appendices F and G).

To illustrate, a descriptive variable *current distribution* has been abstracted, by the author, from the language of the listings. The Service uses terms such as: limited, endemic, restricted, relict, one area, island, widespread, disjunct/isolated, or a combination of these terms to describe the gradations within this variable.

The discrete categories for this variable (see Appendices F and G) were abstracted from terms which were most common (core terms) throughout the listings. For this variable, an

initial set of 5 discrete categories was created from the core terms found throughout the listings. The five initial discrete categories were: widespread, restricted, relict, endemic, and a single area. Discrete categories were, in a few cases, not mutually exclusive.

The reader is referred to the data codification form (Appendix G) for a detailed explanation of the hierarchical assignment of a species to a particular discrete category when more than one distinct core term or phrase was found in a listing.

Additional, less frequently used, single terms were added to a particular discrete category when they appeared with the original "core" term to describe a particular criterion. For example, the word "limited" often appeared in conjunction with the core term "restricted." And, the word "island" often appeared together with the core term "single area." These two additional words, "limited" and "island," were added to the discrete categories of "restricted" and "single area" respectively. The solo use of one of these terms could then also trigger assignment to that particular discrete category.

In some instances, a core term could be present in the verbiage, but the presence of an additional, new biological adjective would necessitate the creation of a new discrete category. For example, a description of *current distribution* that delineated a single area (breeding ground) for a species with migratory status necessitated the addition of a new

category that recognized that migratory status (see Appendices F and G). Another example is the frequent inclusion of the word "isolated" in several listing descriptions of *current distribution*. A species may be described as having a relictual distribution and as being distributed only in isolated areas within its remaining range. I established a 6th category for *current distribution* to enable recognition of the isolated and/or disjunct nature of these range distributions.

If a "core" term (as described above) was not found in a listing, then the verbiage or single word was translated either into an existing or, if necessary, a new discrete category. Often there was enough information in a listing to place it into an already existing category even though a core term was not used. For example, the phrase "historically known only from" was translated into "endemic" and the species was placed into that already existing discrete category. But a description of *current distribution* as "captive populations only" demanded the addition of a new discrete category.

The data codification form (Appendix G) contains a complete examination of the words and phrases that triggered assignment of a species to a particular discrete category within a descriptive categorical variable.

The first term presented within each discrete category in the data codification form is the core term. The following words or phrases separated by a backslash (/) are the other

words and/or phrase translations which triggered assignment to that particular category. Definitions are provided if they clarify distinctions between categories.

This data codification form can be used in conjunction with the data classification form (Appendix F) and with the database (Appendix H). The capitalized acronyms associated with each variable name in the data codification form are the column headings in the database (Appendix H) and are also found in the data classification form (Appendix F).

Because the verbiage was not generally consistent from one listing to the next, the process described above was necessarily iterative and many-tiered. Once all the descriptive variables and their discrete categories were established, the data classification form was developed (Appendix F).

One of the more intriguing aspects of the final listings is the biological information that is not reported. To allow examination of this aspect of the final listings, three types of unreported variables (see Appendix F) were defined as follows: (1) the variable was not reported by the Service because it was not applicable to the species in question; (2) the variable was applicable to the species in question but was not mentioned by the Service; (3) the variable was reported by the Service as being applicable to the species in question but the Service had no information regarding same. Examination of the amount and type of unreported variables allowed the

investigator to determine whether there was systematic and consistent consideration of variables within and across classes.

The developed data classification form was used to reprocess and codify all of the final listings to ensure consistency and accuracy. This included codification of the unreported variables as described above. The resultant database is presented in Appendix H.

Methods of Analysis

Quantitative and Descriptive Data

Discrete quantitative and descriptive categorical data found in a single listing for specific variables (as with the Baluchistan bear above) were analyzed to determine whether quantitative ranges could be inferred for and applied to the discrete variable categories. This would allow for conversion of the two data types into one data type for analysis of these variables.

Missing Data

Incidence of missing data was determined for all variables both across all applicable listings and within the four designated classes. For those variables which reported both quantitative and discrete data values, the percent use of each data type was determined.

Designation of Species as Endangered or Threatened

Due to the large amount of unreported variables (missing data) within and across classes and across all variables, histograms, scatterplots, stem-leaf plots and summary statistics were initially employed in an attempt to identify thresholds between endangered and threatened species.

Linear discriminant analysis (developed by R. A. Fisher cited in Mardia et al. 1979) was then used to explore various combinations of the biological criteria in an effort to determine whether and to what degree different combinations of these criteria might effectively discriminate endangered species from threatened species. Discriminant analysis produces linear combinations of the predictor variables which serve to classify observations into distinct groups.

Presumably, the assessment of several variables leads to the decision to list a species as endangered or threatened. Therefore, while recognizing that the large amount of missing data argues against doing parametric multivariate analyses, this discriminant analysis was done to ensure investigative thoroughness.

Chan (1972) concluded that, for discriminant analysis, substituting the mean values for each variable is one of the best treatments for missing data (the other being principal components analysis). In these analyses, the missing data values were replaced by the empirical means for each variable.

A jackknife procedure (developed by J. W. Tukey cited in Sokal and Rohlf 1981) was then used to obtain an improved estimate of the misclassification rate produced by the original discriminant analysis. The jackknife procedure leaves out one observation at a time, and calculates the discriminant function on the remaining N-1 observations (Norusis 1985). The withheld observation is then classified. This produces a less biased estimate of the misclassification rate since the observation being classified has not been considered in the calculation of the function.

Pieces of Biological Information

Final listings were sorted into groups based upon the number of pieces of biological information (number of variables) found in them (Table 3). These mutually exclusive groups ranged from 5 to 32 pieces of biological information per listing. For example, 6 listings were found to contain 5 pieces of biological information (variables), while 1 listing was found to contain 32 pieces of biological information or variables.

Variable use, within these groups, was examined to identify the type of biological information utilized. This allowed identification of the specific biological variables used in final listings when those listings contained only a small number of variables. For example, for those 6 listings which reported only 5 variables, identification of those 5

Table 3. Percent variable use within groups of listings which were sorted according to the number of pieces of biological information (variables) found in them. Listings were found to have anywhere from 5 to 32 pieces of biological information. Total number of listings per group is presented at the bottom of the table. For example, 6 listings were found to contain 5 pieces of biological information while only 1 listing reported 32 pieces of information. Historic distribution was reported in 83% of those listings which contained 5 variables.

	PIECES OF BIOLOGICAL INFORMATION (VARIABLES)																																
Variables	5	6	7	8	10	11	12	15	16	17	20	21	22	25	26	27	28	29	30	32													
Historic Number	0	0	0	0	33	10	0	7	18	14	17	53	31	42	63	60	100	50	67	0													
Current Number	17	0	14	29	58	47	92	71	73	36	75	73	69	92	87	100	67	100	67	100													
Historic Distribution	83	100	11	86	100	95	100	100	100	100	100	100	77	100	100	100	100	100	100	100													
Current Distribution	83	100	86	86	92	89	100	100	100	100	100	100	100	100	100	100	100	100	100	100													
Number of Populations	0	20	43	43	33	63	69	71	82	100	83	100	77	92	100	100	100	100	100	100													
Isolated/Contiguous Pops.	0	0	29	0	25	47	38	50	82	64	67	73	61	67	63	100	100	50	100	100													
Population Trend	0	0	43	86	42	53	69	57	45	78	92	73	85	100	75	100	100	100	100	100													
Historic Range Lost	0	40	0	14	33	42	31	43	36	7	92	40	69	83	75	100	100	100	100	67	100												
Expected Range Loss	0	20	0	0	0	5	8	14	0	7	33	7	23	17	0	60	100	100	0	100													
Habitat Specific	17	20	29	14	33	32	38	78	54	64	58	93	100	100	100	100	100	100	100	100													
Status of Occupied Habitat	0	20	14	0	25	37	31	57	64	57	42	87	69	75	100	100	100	100	100	100													
Habitat Lost	83	60	86	57	83	79	77	78	91	93	92	93	92	100	100	100	100	100	100	100													
Expected Habitat Loss	83	20	71	57	50	58	61	64	64	57	75	80	92	100	100	100	100	100	100	100													
Prey Specific	0	0	14	0	0	5	0	21	45	50	25	67	31	42	50	80	67	50	33	100													
Status of Prey	0	0	0	0	0	5	0	21	27	28	25	13	23	25	37	20	33	0	33	100													
Past Impact of Catastrophe	0	0	0	0	0	0	0	0	9	7	17	0	23	17	25	40	67	50	100	100													
Future Impact of Catastrophe	0	0	0	0	0	0	0	0	18	7	33	0	15	17	13	80	33	50	100	100													
Past Impact of Human Pred.	33	20	43	43	75	74	77	78	64	78	83	80	92	100	100	80	100	100	100	100													
Future Impact of Human Pred.	0	20	43	29	50	74	77	57	64	78	83	93	92	100	87	80	100	100	100	100													
Past Impact of Non-exotic Spp.	17	0	0	0	17	0	0	14	36	50	50	60	77	42	100	60	100	100	100	100													
Future Impact of N-e Spp.	17	0	0	0	0	0	0	14	36	43	50	60	77	42	87	60	100	100	100	100													
Past Impact of Exotic Spp.	0	0	14	14	8	5	31	36	36	57	8	40	54	67	87	40	67	50	100	0													
Future Impact of Exotic Spp.	0	0	0	0	0	5	15	28	36	57	25	47	46	67	87	40	67	50	100	0													
Past Impact of Pollution	0	0	0	29	0	5	0	0	9	7	25	20	54	100	50	40	67	50	100	0													
Future Impact of Pollution	0	0	0	57	0	10	0	0	9	7	17	27	38	100	50	60	67	50	100	0													
Past Impact of Disease	0	0	14	0	17	5	0	28	36	43	42	73	77	75	87	60	33	100	100	100													
Future Impact of Disease	0	0	0	0	0	5	0	28	36	43	50	73	77	83	75	60	33	100	100	100													
Genetic Problems	0	0	0	0	8	0	0	21	0	0	17	7	8	0	13	60	67	50	67	100													
Demographic Stochasticity	0	0	0	0	0	0	0	0	0	0	8	7	0	0	25	40	33	0	33	100													
Litter #/Reprod. Rate	0	0	0	0	0	0	8	0	0	7	42	27	31	25	87	60	67	100	100	100													
Infant Mortality	0	0	0	0	0	0	0	14	9	57	25	20	31	67	37	40	33	50	100	100													
Persistence Time	0	0	0	0	0	0	8	0	9	7	0	7	8	0	13	20	0	0	0	100													
Legal Protection from "Take"	17	60	14	29	67	74	85	71	82	86	100	93	100	100	100	80	100	100	100	100													
Protection from Other Acts	0	20	0	29	42	42	31	64	45	57	58	33	31	25	63	40	0	50	0	100													
Effectiveness of Protection	17	80	14	29	58	68	69	50	54	50	75	67	69	83	50	80	100	100	33	100													
Protection of Habitat	0	0	0	0	8	10	0	50	54	14	83	93	61	33	100	80	100	100	100	100													
Unique Habitat	33	0	57	71	42	42	54	86	54	71	83	80	100	100	100	100	100	100	100	100													
Ecol. Assoc. with E/T Spp.	0	0	0	0	0	5	23	14	9	7	25	20	23	67	25	40	0	50	0	0													
# Assoc. E/T Or Candid. Spp.	0	0	0	0	0	5	8	7	9	7	25	20	15	58	0	40	0	50	0	0													
TOTAL # LISTINGS IN GROUP	6	5	7	7	12	19	13	14	11	14	12	15	13	12	8	5	3	2	3	1													

variables was possible. This also allowed identification of the specific biological variables used in final listings when those listings contained a considerably larger number of variables.

Once final listings were sorted by the number of pieces of biological information (as described above), they were then sorted within year groups. This allowed identification of changes in the amount of biological information considered over the years. For example, in the years from 1975 - 1979, the greatest number of listings used 11 variables, while the greatest number of listings in the year group from 1985 - 1989 used 24 variables.

Variable use within these year groups was also examined to identify changes in the type of biological information considered over the years. For example, the variable *amount of habitat protected* was considered in 11% of the listings from 1975 - 1979, and 80% of the listings from 1985 - 1989.

Variable use was also summed over all listings to allow ranking of same from the most commonly reported variable to the least commonly reported variable. Examination of within-class variable use identified criteria which were emphasized for mammals, birds, reptiles, and/or fish.

Results

Quantitative and Descriptive Data

At least 20 listings contained both quantitative and descriptive data values for each of 4 variables (Table 4). Because quantitative and descriptive data did not correlate, values could not be assigned to "core" categorical terms. Two variables are presented.

Both quantitative and descriptive data values for *population trend* were presented in 22 listings. Population trend was described as in decline in 7 listings, in significant decline in 7 listings and in precipitous decline in 8 listings. The associated ranges of quantitative values were similar at 50-99%, 50-99% and 66-95% respectively. The application of analogous quantitative ranges to three discrete categories of decline may reflect the differences of biological opinion involved in defining decline as just that or as significant or precipitous. It should be noted that the time period over which a given decline was measured was often not stated and if stated was not constant across listings.

Thirty-one listings presented both descriptive and quantitative values for *number of individuals remaining*. Number of individuals was described as "possibly extinct" (1 individual) in 1 listing; as "extremely rare" (14-7000 individuals) in 9 listings; as "rare", or "low" in numbers (30-12,500 individuals) in 19 listings, and as "abundant"

Table 4. Counts of final listings which contained either a quantitative value, a descriptive value or both for a given variable. Overall percent of use is also given for each variable. Note: This table only includes variables for which both quantitative and discrete values were found in the final listings.

<u>Variables</u>	<u>Quant</u>	<u>Discr</u>	<u>Both</u>	<u>Use (%)</u>
Historic Numbers	10	51	1	23
Numbers of Individuals Remaining	71	72	31	64
Numbers of Populations Remaining	131	71	5	76
Population Trend	4	159	22	68
Historic Range Lost	11	105	20	50
General Habitat Lost	8	212	17	87
Litter Number/Reproductive Rates	6	31	12	18
Infant Mortality	3	43	6	19
Persistence Time	5	5	2	4
Habitat Protection (mammals, birds, reptiles & fish)	3	40	74	43
Total number of listings = 272				

Nesting Success (birds, reptiles & fish)	5	42	7	35
Total number of listings = 153				

Occupied Tributaries (fish only)	23	6	3	53
Total number of listings = 60				

(millions of individuals) in 1 listing. Eight of the species in the "rare" category (30-12,500) had quantitative values of less than 500. The general separation of discrete categories is evident. However, the overlap and breadth of both the "rare" and "extremely rare" categories demonstrates the need for application of numerical ranges to these discrete categories.

Missing Data

The percent of final listings within classes that did not mention a particular variable is presented in Table 5. These percentages do not include variables that were not applicable nor do they include those variables for which it was stated that no information was available.

Not surprisingly, descriptive variables had an overall higher incidence of being considered than did quantitative variables.

Fifty-four percent of descriptive variables were mentioned in greater than 50% of the listings within a class, compared to only 14% of the quantitative variables.

Discrete values for *historic distribution*, *current distribution*, and *impact of past human predation* were mentioned in 90% or more of the listings in all classes. No quantitative variable was mentioned in 90% or more of the listings in all classes.

Table 5. Percent of Federal Register final listings in which variable is not mentioned (Q = quantitative value, D = descriptive value). This does not include variables that were mentioned as not being applicable and/or variables for which it was stated that information was not available. Na=variables for which the quantitative and/or descriptive value was not applicable. Variables were mentioned in less than 50% of applicable listings.

Variable	Mammals		Birds		Reptiles		Fish	
	Q	D	Q	D	Q	D	Q	D
Historic numbers	94	84	79	51	81	76	90	60
# e/t individuals	54	28	23	10	59	48	80	43
Historic distribution	na	4	na	3	na	0	na	3
Current distribution	na	3	na	0	na	0	na	0
# e/t populations	58	36	38	23	52	20	32	8
Population isolation	na	47	na	33	na	35	na	37
Smallest e/t population	70	58	38	33	61	50	63	42
Largest e/t population	71	60	43	41	59	52	65	48
E/T population trend	92	41	64	15	81	30	93	20
Historic range lost	89	42	90	41	93	81	78	42
Expect future range loss	na	76	na	82	na	94	na	87
Habitat specific	na	53	na	15	na	39	na	7
Habitat status	na	47	na	54	na	50	na	13
Habitat lost	93	15	79	5	93	13	90	8
Expect future habitat loss	na	32	na	10	na	35	na	3
Prey specific	na	84	na	67	na	44	na	62
Prey status	na	88	na	90	na	61	na	90
Past catastrophe	na	85	na	87	na	94	na	82
Future catastrophe	na	82	na	87	na	91	na	77
Past human predation	na	9	na	8	na	5	na	3
Future human predation	na	20	na	10	na	5	na	0
Past interspecific predation	na	56	na	31	na	48	na	27
Future interspp predation	na	58	na	31	na	48	na	32
Past exotic species impact	na	82	na	46	na	50	na	42
Future exotic impact	na	84	na	54	na	50	na	42
Past impact of pollution	na	86	na	67	na	89	na	43
Future impact of pollution	na	86	na	64	na	89	na	32
Past impact of disease	na	53	na	33	na	61	na	27
Future impact of disease	na	55	na	38	na	61	na	27
Genetic problems	na	79	na	92	na	98	na	92
Demographic stochasticity	na	96	na	97	na	98	na	90
Litter number	97	90	79	64	87	85	97	75
Infant mortality	97	96	92	64	96	54	93	83
Persistence time	97	96	95	92	96	96	100	97
Legal protection from "take"	na	15	na	5	na	13	na	2
Protection effectiveness	na	23	na	8	na	37	na	57
Habitat protection	86	71	51	43	85	68	18	3
Ecological association with other e/t species	na	92	na	69	na	81	na	32
# associated e/t species	92	na	69	na	89	na	38	na
Active nests	na	na	79	na	96	na	na	na
Nesting success	na	na	87	43	96	56	88	73
Reason nest failure	na	na	na	43	na	52	na	72
Age at maturity	na	na	na	na	89	na	92	na
Occupied drainages	na	na	na	na	na	na	2	na
Occupied tributaries	na	na	na	na	na	na	25	15
Populations lost	na	na	na	na	na	na	68	na

Four quantitative variables were mentioned in at least 75% of the listings within a class: *number of e/t individuals* (birds) and *percent of habitat protected*, *number of occupied drainages* and *number of occupied tributaries* (fish).

Eleven descriptive variables were mentioned in at least 75% of the listings within a class: *habitat lost*, *potential impact of future predation by humans*, and *level of protection from take* (all classes); *number of e/t populations* (birds, reptiles, and fish); *effectiveness of protection from take* (mammals and birds); *population trend*, *expectation of habitat loss*, and *habitat specificity* (birds and fish); *number of e/t individuals* (birds) and *status of remaining habitat*, and *number of occupied tributaries* (fish).

Variables that were mentioned in less than 50% of applicable listings are highlighted in Table 5. In addition, no quantitative variable exceeded 50% mention for mammals or reptiles.

These occasionally used criteria generally require extremely detailed and often unavailable historical, reproductive, genetic, or demographic information, or an assessment of past and future impact from various phenomena.

Some of these occasionally used criteria are class specific measures of similar biological phenomena. Consideration of a single measure of the phenomena would be beneficial for comparison and ranking across classes. As an example: a reproductive measure generally applicable to all

classes would be preferable to the myriad measures (eggs/clutch, clutches/year, young per pair, litter number, productivity etc.) that now appear sporadically in the listings. I would suggest *realized natality* as one to consider.

Designation of species as endangered or threatened

In an effort to elucidate e/t thresholds, summary statistics were examined for quantitative variables which were utilized in at least 10% of applicable listings (Table 6).

No variable demonstrated complete division of the distributions for endangered and threatened species. This is not surprising, since presumably (as mentioned above) the assessment of several variables leads to the listing of a species as endangered or threatened. However, some of the trends are worth noting.

It should be noted that the levels of missing data are quite high for these quantitative variables (see Table 5). These are simply trends found in the data which were reported.

No species listed as threatened had fewer than 150 individuals remaining while 32% of species selected to be listed as endangered had fewer than 150 individuals. Fifty percent of threatened species had more than 2000 individuals remaining compared to only 15% of endangered species.

Table 6. Summary statistics across or within classes for quantitative variables which were utilized in at least 10% of applicable listings. Does not include missing values.

Variable	E/T	Obs.	Avg	Min	Max	Median	Quartiles	
Individuals remaining								
all classes	e	79	1646	0	16000	300	100,	875
	t	22	65613	159	1300000	2189	600,	7000
mammals	e	44	1753	0	15800	400	170,	720
	t	5	277643	1500	1300000	13718	7000,	66000
birds	e	22	2049	14	16000	321	100,	1680
	t	8	4456	159	15800	1921	500,	6076
reptiles	e	8	663	30	4500	88	50,	250
	t	6	2871	350	6324	2525	1000,	4500
fish	e	5	494	1	1300	100	67,	1000
	t	3	797	441	1500	450	441,	1500

Populations remaining								
all classes	e	94	3.83	1	46	1	1,	4
	t	42	6.52	1	43	3	1,	7
mammals	e	43	3.60	1	16	1	1,	4
	t	3	3.00	1	5	3	1,	5
birds	e	19	6.95	1	46	2	1,	9
	t	5	2.80	1	10	1	1,	1
reptiles	e	11	2.45	1	11	1	1,	2
	t	14	8.29	1	43	2.5	1,	4
fish	e	21	2.19	1	12	1	1,	2
	t	20	6.75	1	30	3.5	1,	8

Drainages (#) (fish only)	e	24	1	0	2	1	1,	1
	t	20	1	1	5	1	1,	1

Tributary (#) (fish only)	e	13	2	0	10	1	1,	3
	t	13	7	0	30	4	3,	5

Population decline (%) all classes	e	17	79	3	99	90	70,	95
	t	9	73	50	99	79	63,	83

Range lost (%) all classes	e	15	69	0	99	80	60,	96
	t	14	42	0	94	30	0,	85

No threatened mammal had fewer than 1500 individuals, while 82% of endangered mammals did. Twenty-three percent of endangered mammals had fewer than 150 individuals remaining.

Thirty-two percent of endangered birds had fewer than 150 individuals, while no threatened bird had fewer than 150 individuals remaining. Eighty-eight percent of endangered reptiles had 300 or fewer individuals, while no threatened reptile had fewer than 300 individuals remaining.

Mammals selected for listing as threatened had dramatically higher numbers of individuals remaining than did birds, reptiles, or fish (see Table 6). This may be a reflection of historical public support for charismatic megafauna which has overshadowed less conspicuous life forms.

A single remaining population was the mode for both endangered and threatened species at 52% and 43% respectively. However, the second and third quartile values were consistently lower for endangered species (with the exception of birds).

It should be noted that a single remaining population does not necessarily indicate one population remaining for the entire species or subspecies in question. It does indicate that within the listed portion of that species or subspecies there is only one population left.

A majority of endangered fish (61%) occupied 0 or 1 tributaries, while a majority of threatened fish (85%) occupied 3 or more tributaries. A majority of endangered

species (80%) realized a range loss of at least 60% while a majority of threatened species (64%) had lost no more than 40% of their historic range.

Histograms were examined to compare the percentage of times that a core term (descriptive variable category) was applied to an endangered or threatened species. Appendix D presents comparative histograms for descriptive variables. The histogram for *number of e/t individuals* remaining is presented (Fig. 1). There was considerable overlap in the application of core terms to both endangered and threatened species within all descriptive variables. The least amount of overlap was found in the descriptive variable categories presented in Table 7. Some categories present unexpectedly higher values for threatened species. Core terms that were applied frequently to both endangered and threatened species are presented in Table 8. Extreme categories of habitat-related variables were used more frequently for both endangered and threatened species than population- or threat-related variables. Awareness by Service biologists of the crisis of dwindling habitat for many vulnerable species may have led to this common consideration of habitat.

Discriminant analysis of all variables, used by the Service for mammals, birds, fish & reptiles (n=53), correctly classified 76% of the endangered species and 75% of the threatened species (Table 9). Sixty-five species (24%) were misclassified. However, 96 species (35%) were misclassified

Table 7. Categories within descriptive variables for which the separation between endangered and threatened species was at least ten percentage points. The numeric value is the percent of times that the particular discrete category was mentioned.

<u>Variable</u>	<u>Category</u>	<u>Endangered</u>	<u>Threatened</u>
Current distribution (range)	restricted	17	32
Estimate of the number of individuals remaining	low	28	15
Estimate of historic range that has been lost	high	44	23
Expectation of continued habitat loss	high	54	68
Forage/prey specificity	specialist	18	29
Potential future impact from exotic species	severe	27	38
Potential future impact from pollutants	severe	13	31
Populations legally protected from "take"	none	25	10
Populations legally protected from "take"	all	42	26

Table 8. Categories within descriptive variables which were used in greater than 20% of the final listings both within endangered species listings and within threatened species listings.

Variable	Category	Endangered (%)	Threatened (%)
USFWS listed classification	subspecies	37	32
	species	55	57
Range & numbers listed	entire	94	89
Historic distribution	widespread	30	24
	endemic	43	46
Current distribution	relict	27	23
# populations	populations (no indication of numbers)	23	32
Isolated or contiguous pops	isolated	24	22
Population trend (decline)	decline	35	28
	precipitous decline	26	20
Range lost	severe	44	23
Habitat specialist	specialist	61	55
Status of occupied habitat	rare/patchy	23	24
General habitat lost	severe	78	70
Expectation of continued habitat loss	high	54	68
Impact of past predation by humans	severe	46	41
Potential impact of continued predation by humans	severe	50	41
Past impact from exotic species	severe	20	27
Potential severity of continued impact from exotic species	severe	27	38
Current level of legal protection from take	all populations protected	42	50
Effectiveness of protection	ineffective	26	31
Current level of habitat protection	none protected	27	29
Unique habitat	yes	56	55
Reason for nest failure (birds, reptiles & fish)	nest predation (non-human)	23	24

Table 9. The numbers and percent of listed species that were successfully classified into endangered species and threatened species using discriminant function analysis and jackknife validation.

Discriminant Function Analysis			
	Species classified into		Total
	endangered	threatened	
Endangered species	137 76.54	42 23.46	179 100.00
Threatened species	23 24.73	70 75.27	93 100.00
Total percent	160 58.82	112 41.18	272 100.00
Priors	50.00	50.00	

Jackknife Validation			
	Species classified into		Total
	endangered	threatened	
Endangered species	121 67.60	58 32.40	179 100.00
Threatened species	38 40.86	55 59.14	93 100.00
Total percent	159 58.46	113 41.54	272 100.00
Priors	50.00	50.00	

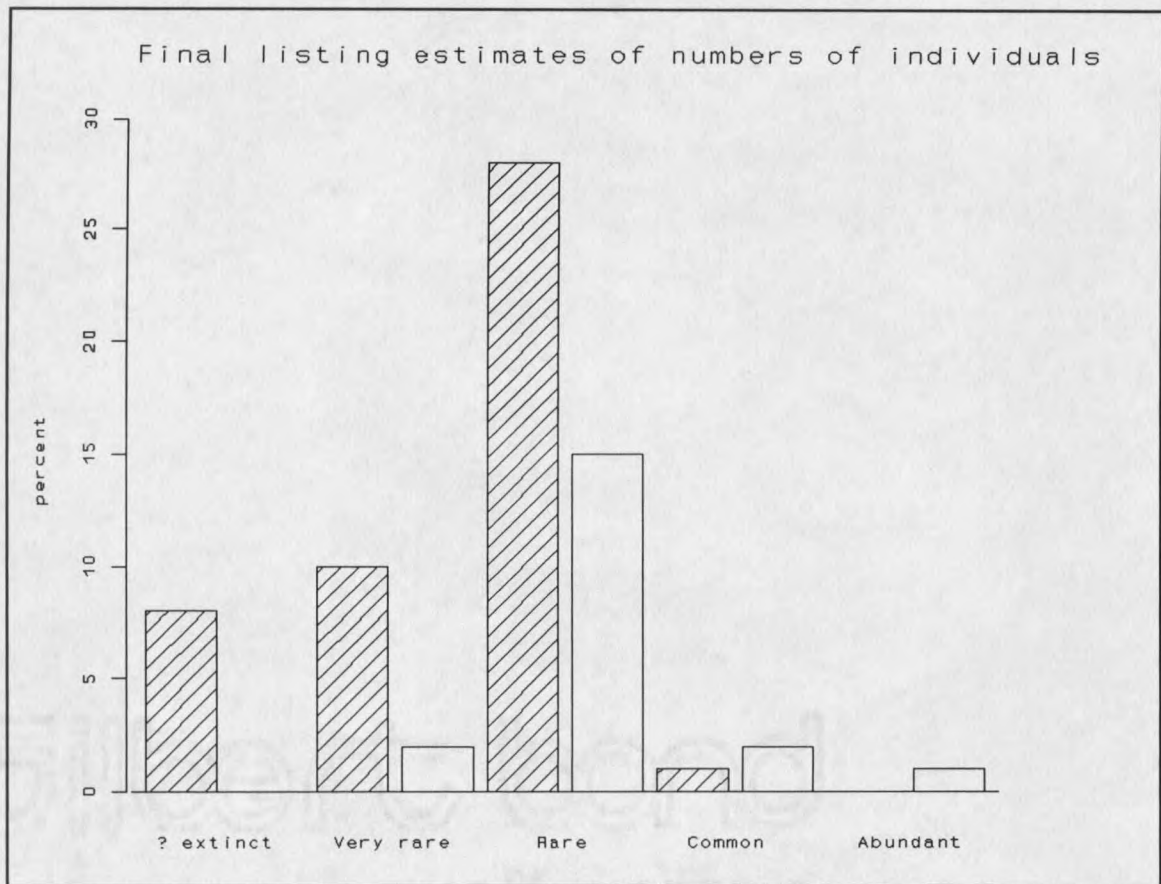


Figure 1. Comparison of the distribution of endangered species (////) with the distribution of threatened species for the discrete variable *numbers of elt individuals remaining*. Missing values for endangered species and threatened species are 53% and 80% respectively. Y-axis is the percent of final listings which were found in each discrete category.

using the jackknife procedure. This jackknifed, less biased estimate of the misclassification rate indicates that the initial and lower misclassification rate is in part a product of noise in the original discriminant model.

An examination of the relative magnitudes of the standardized discriminant function coefficients indicated that the variables *number of individuals remaining* and *species group* (mammal, bird, fish or reptile) may have relatively

greater predictive power for classifying species as endangered or as threatened.

Discriminant analysis of these two variables (*number of individuals remaining* and *species group*) misclassified 85 (31%) of the species, while the jackknife procedure misclassified 87 (32%) of the species. This result indicated that other variables in the model may be important.

Including two more variables [*current distribution (range)* and the *amount of habitat that has been lost*] improved the model only slightly. These variables were selected because they exhibit low levels of missing values (2% and 16% respectively) as well as relatively large coefficients (Table 10). It should be noted that the variable *number of individuals remaining* has a 63% missing value rate while *species group* has no missing values. Discriminant analysis using these 4 variables [*number of individuals remaining*, *species group*, *current distribution (range)*, and the *amount of habitat that has been lost*] misclassified 79 (29%) of the species. The jackknife procedure misclassified 84 (31%) of the species.

The F test for variance equality ($F = 0.976$, num df = 178, denom df = 92, p-value = 0.8784) as well as the normal probability plot of residual scores both indicate that the discriminant function model is legitimate.

However, the function eigenvalue of .509 indicates that the discriminant function is not a "good" function in terms of

Table 10. Sample size, mean, standard deviation, standardized discriminant function coefficients and discriminant eigenvectors for discriminating variables.

ENDANGERED					
Variable	N	Mean	SD	DF Coefficients	DF Eigenvectors
GROUP (mammals, birds, fish or reptiles)	179	-0.249	0.913	-0.23878	0.388
INDIVIDUALS (numeric estimate of individuals remaining)	179	-0.207	1.114	-0.25361	0.412
CURRENT DISTRIBUTION (Range)	179	-0.131	0.987	-0.12039	0.196
HABITAT LOST (Descriptive estimate)	179	-0.111	0.824	-0.11969	0.194
CONSTANT				-0.13118	

THREATENED					
GROUP (mammals, birds, fish or reptiles)	93	0.480	0.980	0.45958	0.388
INDIVIDUALS (numeric estimate of individuals remaining)	93	0.398	0.533	0.48813	0.412
CURRENT DISTRIBUTION (Range)	93	0.252	0.972	0.23172	0.196
HABITAT LOST (Descriptive estimate)	93	0.214	1.240	0.23035	0.194
CONSTANT				-0.48597	

group discrimination. There is only fair between-groups variability compared to within groups variability. The misclassification rates (reported above) also support this conclusion that, given the data, the discriminant function model is unable to adequately discriminate endangered from threatened species.

Pieces of Biological Information

Current distribution, historic distribution, amount of habitat lost and expectation of continued habitat loss receive the highest amount of use when only five pieces of biological information (biobytes) are presented in a listing. These four variables along with the *level of protection from "take"* are the most commonly used variables over all biobyte groups (Table 11).

The amount of information utilized per listing has been increasing steadily since 1975. Seventy-six percent of the 1975-1979 listings had fewer than 15 biobytes (variables) per listing, whereas only 4% of the 1985-1989 listings had fewer than 15 biobytes per listing (Table 12). Twenty-four percent of the 1975-1979 listings had 15-25 biobytes per listing while 77% of the 1985-1989 listings had 15-25 biobytes per listing. None of the listings finalized in 1975-1979 had 26 or more biobytes per listing while 19% of the 1985-1989 listings and 26% of the 1990-1991 listings had 26 or more biobytes per listing.

Table 11. Rank of total variable use over all listings. Variables with the same ranking are grouped. This table does not include 7 variables which are specific only to birds, reptiles and/or fish.

<u>Rank</u>	<u>Variable</u>
1	Current Distribution
2	Historic Distribution
3	Legal Protection from "Take"
4	Expectation of Continued Habitat Loss
5	Habitat Lost
6	Number of Populations
6	Habitat Specific
6	Unique Habitat
7	Status of Occupied Habitat
8	Population Trend
9	Past Impact of Predation by Humans
10	Isolated/Contiguous Populations
10	Impact of Continued Predation by Humans
10	Past Impact of Non-Exotic Species
10	Protection of Habitat
11	Future Impact of Non-exotic Species
11	Historic Range Lost
12	Estimate of the Number of Individuals Remaining
12	Past Impact of Disease
12	Future Impact of Disease
12	Litter Number/Reproductive Rate
12	Effectiveness of Protection from "Take"
12	Expectation of Continued Range Loss
13	Past Impact of Catastrophe
13	Future Impact of Catastrophe
13	Past Impact of Pollution
13	Future Impact of Pollution
13	Infant Mortality
14	Historic Numbers
14	Prey Specific
14	Status of Prey
14	Past Impact of Exotic Species
14	Future Impact of Exotic Species
14	Genetic Problems
15	Demographic Stochasticity
15	Persistence Time
15	Protection from Other Acts
16	Ecological Association with Other E/T Species
16	Number of Associated Listed and Candidate Species

Table 12. Number of final listings within groups sorted initially by the number of variables per listing and then sorted by years. Variable count does not include 7 variables which are specific only to birds, reptiles and/or fish. See variable list.

Number of Variables	Year of final listing			
	1975-1979	1980-1984	1985-1989	1990-1991
5	5	1	0	0
6	4	1	0	0
7	5	2	0	0
8	6	1	0	0
9	8	0	0	0
10	10	2	0	0
11	15	3	0	1
12	9	4	0	0
13	8	2	2	0
14	8	3	1	1
15	3	6	3	2
16	4	4	1	2
17	6	7	1	0
18	1	7	4	1
19	6	7	6	0
20	1	3	5	3
21	3	1	9	2
22	0	3	10	0
23	1	1	9	1
24	0	1	11	1
25	0	7	2	3
26	0	0	8	0
27	0	1	3	1
28	0	0	1	2
29	0	0	1	1
30	0	0	2	1
31	0	0	0	0
32	0	0	0	1
Total Listings Found in Each Year Group	103	67	79	23

The type of biological information utilized by the Service to select species to list as endangered or threatened has also evolved over the years from general distribution variables to more finely detailed population and habitat variables.

Current distribution, historic distribution, and amount of habitat lost were utilized by the Service in 80% or more of the final listings in 1975-1979 (Table 13). In 1980-1984, Service biologists additionally used (greater than 80% use) *number of populations remaining, population trend, and unique habitat*. With the listings of 1985-1989, *habitat considerations* came solidly to the fore with *amount of habitat protection, habitat specificity, status of occupied habitat, and expectation of continued habitat loss* also receiving greater than 80% use. Recognition by biologists that human "take" was critically impacting numerous sensitive species brought *impact of past predation by humans, and level of protection from "take"* up to 80% use in these years. In the most recent listings (1990-1991) Service biologists have additionally considered *number of remaining individuals, and continued impact of predation by humans* in at least 80% of the listings.

In an examination of variable use across classes *amount of habitat lost, historic distribution and current distribution* received greater than 80% use in all classes (Table 14). *Level of protection from "take", and past impact*

Table 13. Percent of final listings, within year groups, in which variables were used.

Variable	Year of Final Listing			
	75-79	80-84	85-89	90-91
Historic Numbers	14	13	38	39
Number of E/T Individuals	48	64	77	91
Number of E/T Populations	58	82	91	87
Population Trend	54	81	68	91
Historic Range Lost	32	51	65	70
General Habitat Lost	83	88	90	96
Litter #/Repro. Rate	7	10	34	35
Infant Mortality	11	31	19	22
Persistence Time	3	6	4	9
Habitat Protection	11	36	80	83
Historic Distribution	94	99	96	100
Current Distribution	94	100	100	100
Isolated/Contiguous Populations	43	60	76	61
Expected Range Loss	9	4	27	39
Habitat Specific	36	70	94	83
Status of Habitat	31	63	87	57
Expected Habitat Loss	66	66	90	91
Prey Specific	12	39	46	35
Status of Prey	6	27	19	22
Past Impact of Catastrophe	1	9	16	35
Future Impact of Catastrophe	2	9	25	35
Past Impact of Human Predation	70	79	82	87
Future Impact of Human Predation	62	79	77	87
Past Impact of Non-exotic Species	22	21	65	65
Future Impact of Non-exotic Species	20	21	61	65
Past Impact of Exotic Species	16	54	51	26
Future Impact of Exotic Species	10	54	54	26
Past Impact of Pollution	9	21	34	35
Future Impact of Pollution	13	22	35	35
Past Impact of Disease	21	18	67	57
Future Impact of Disease	17	19	67	57
Genetic Problems	2	1	30	22
Demographic Stochasticity	1	0	10	13
Legal Protection from "Take"	70	78	96	87
Protection from other Acts	40	19	15	48
Effectiveness of Protection	67	46	57	78
Unique Habitat	39	88	96	83
Ecological Association with E/T Species	6	30	24	13
Number Associated E/T &/or Candidate Species	5	24	19	13
TOTAL LISTINGS (all classes)	103	67	79	23

Nesting Success	32	43	25	53
Primary Reason for Nest Failure	37	45	27	53
TOTAL LISTINGS (birds, reptiles & fish)	38	49	51	15

Age at Maturity (females)	0	2	15	50
TOTAL LISTINGS (reptiles & fish)	28	41	39	6

Active Nests	11	0	26	0
TOTAL LISTINGS (birds & reptiles)	27	36	19	11

Occupied Tributaries	64	15	66	50
Occupied Drainages	82	62	72	100
Number of Populations Lost	18	54	31	0
TOTAL LISTINGS (fish only)	11	13	32	4

Table 14. Percent of final listings, within classes, in which variables were used. Quantitative and descriptive values for applicable variables have been combined for a total use value. Variables were utilized in less than 50% of applicable listings.

Variables	Mammals	Birds	Reptiles	Fish
Historic Numbers	14	46	11	35
Number of Individuals Remaining	71	90	43	53
Number of Populations Remaining	64	87	78	92
Population Trend	58	85	67	78
Historic Range Lost	55	59	19	58
General Habitat Lost	83	95	87	90
Litter Number/Reproductive Rate	9	36	17	25
Infant Mortality	3	36	46	15
Persistence Time	4	8	4	3
Habitat Protection	29	56	30	75
Historic Distribution	95	95	100	97
Current Distribution	95	100	100	100
Isolated/Contiguous Populations	51	67	63	62
Expected Range Loss	21	18	6	12
Habitat Specific	47	85	61	92
Status of Habitat	52	46	50	83
Expected Habitat Loss	65	90	65	95
Prey Specific	15	33	54	37
Status of Prey	12	10	37	10
Past Impact of Catastrophe	8	13	6	17
Future Impact of Catastrophe	11	13	9	22
Past Impact of Human Predation	76	77	87	70
Future Impact of Human Predation	66	74	87	73
Past Impact of Non-exotic Species	24	41	50	52
Future Impact of Non-exotic Species	23	41	50	47
Past Impact of Exotic Species	14	54	50	55
Future Impact of Exotic Species	13	46	50	57
Past Impact of Pollution	5	33	11	55
Future Impact of Pollution	4	36	11	65
Past Impact of Disease	26	54	37	47
Future Impact of Disease	24	49	37	48
Genetic Problems	20	8	2	7
Demographic Stochasticity	4	3	2	8
Legal Protection from "Take"	81	82	85	77
Protection from other Acts	39	21	35	5
Effectiveness of Protection	74	79	57	22
Unique Habitat	49	82	83	98
Ecological Association with E/T Species	8	31	19	27
Number Associated E/T &/or Candidate Spp.	8	31	11	20
Nesting Success	--	56	44	13
Primary Reason for Nest Failure	--	56	48	17
Age at Maturity (females)	--	--	11	7
Active Nests	--	15	4	--
Number of Occupied Tributaries	--	--	--	53
Number of Occupied Drainages	--	--	--	73
Number of Populations Lost	--	--	--	32
Total Listings	119	39	54	60

of predation by humans were both used in at least 70% of the listings in all classes. *Number of populations remaining, expectation of continued habitat loss, and impact of continued predation by humans* were each used in at least 60% of listings in all classes.

Variables that were utilized in less than 50% of applicable listings are shaded in Table 14. Again, many of these variables require an assessment of past and future impact of some phenomenon, or detailed, often unknown historical, reproductive, genetic or demographic information.

As expected some criteria were more class-specific than others. The *impact* (past and future) of *exotic species* upon native organisms was considered frequently in bird, reptile, and fish listings as was *uniqueness of habitat*. Introductions of exotic species into unique islands of habitat have critically impacted many nesting populations of reptiles and birds. The impact of exotic fish upon native species has taken many devastating forms-- primarily habitat encroachment, predation, and hybridization.

The *impact* (past and future) from *pollution* was considered more frequently in the bird and especially the fish listings. Toxic levels of pollutants are often transported via water vectors. This recognition may explain the more frequent consideration of the impact of pollutants, by Service biologists, for birds and fish.

Effectiveness of protection from "take" is regarded considerably less often for fish than for mammals, birds, or reptiles. Mammal, bird and reptile body parts (or the live organism) reap lucrative financial rewards for poachers. This far outstrips the incentive for poaching of fish (generally for meat) and may explain the low use of this criterion for fish.

Historic range lost is considered much less often in the reptile listings than in the mammal, bird and fish listings. This may reflect a lack of historical information on many reptiles.

Nesting/ spawning success and reason for nesting/spawning failure is considered frequently in the bird and reptile listings. This type of information may be less attainable for fish.

Discussion

It is clear from the amount of missing data found in the final listings in this study that comparison and ranking of species by their degree of vulnerability is fraught with tremendous uncertainty. This level of uncertainty balloons with the inconsistent use of biological criteria within and across classes. Variables that are simply not mentioned are by far the most prevalent type of missing data. The lack of mutually exclusive, defined categories within descriptive

variables, as found in this study, further impacts the scientific basis of the selection process.

The predominantly descriptive nature of the data found in the final listings reflects a real world lack of detailed quantitative data. However, this difficulty does not preclude systematic consideration of a set of well-defined variables and categories within them. Such action would dramatically strengthen the foundation of the selection process.

A list of biological criteria applicable across all classes and within classes must be developed and then consistently addressed. If a variable is not applicable to a particular species, that ought to be noted. If a variable is applicable but no information is available, that ought to be noted. This systematic approach to evaluating species for listing as endangered or threatened allows for both a comparison of the information available and an assessment of the information gap for each species. Relative levels of uncertainty (based upon the breadth of the information gaps) may be determined. The documented consideration of biological criteria also allows researchers an immediate view of the data which may then indicate the management action that is most urgently needed.

The broad and vague definitions found within the Act for terms such as endangered and threatened (Murphy & Noon 1991, Murphy 1992, Rohlf 1991) mirror the vagueness within the entire selection process.

The Service must define the variables that they choose to use. Categories within those variables must then be defined relative to each other. Categories for variables such as the *number of individuals remaining* (see Fig. 1) must have numerical ranges bound to them to enable consistent, comparable, and objective placement of species into such categories.

The potential use of data-hungry techniques such as population viability analysis fades in light of the high levels of missing data reported in this study. However, it is possible that by consistently addressing definitive biological criteria a computerized ranking algorithm such as classification and regression trees (Breiman et al. 1984) may be developed and employed to evaluate, compare and rank species.

A list of standard references should be designated, by the Service, for use as a starting point to attain the required data. *Mammals of the World* (Nowak & Paradiso 1983) typically contains historic and current distribution, population, habitat, reproductive potential, and forage/prey information as well as information regarding past and future impact from humans, exotics, pollution, disease and inter/intraspecific organisms. Biological information was found in these volumes that was not considered in the final listings.

In addition to listed species, there are close to 4000 candidate species and multitudes of species not yet considered which are apparently in some degree of danger from extinction. We cannot accurately parcel species into vaguely defined degree-of-threat categories based upon undefined biological variables and nebulous categories within those variables. To do so certainly invites ambiguity into the selection process.

Conclusion

The documented, systematic consideration of a set of well-defined variables and categories within them is a necessary first step in the development of a sound, scientific methodology for making determinations of endangerment. The development of such a methodology would aid in reducing uncertainty and allow for more equitable and objective comparison and ranking of species by their degree of vulnerability.

In 1969, the House Committee explained the standard for determining endangerment (present in the ESCA) as follows:

Many witnesses testifying at the hearings expressed concern that the legislation does not contain meaningful, objective standards to guide the Secretary when making a determination whether certain species are threatened with worldwide extinction. They feared that with the relative absence of standards, the Secretary could, at some stage, take arbitrary or frivolous action. Your committee does not believe specific standards can be written into the legislation without harming the effect of the legislation. Existing species are so varied that a standard to fit all appears incredibly complex and cumbersome....²¹

Endangered species regulations should contain objective, biological criteria to "guide the Secretary when making determinations"...of endangerment. The lack of documented, defined variables (biological criteria) and categories within these variables, as found in this study, significantly impacts the scientific validity of the listing decisions.

On November 17, 1988 the United States District Court for the Western District of Washington found that:

FWS had acted in an arbitrary and capricious manner, noting that FWS failed to (1) show a rational connection between the evidence presented and its decision not to list the owl (northern spotted owl) as endangered and (2) consider whether the owl could be listed as a threatened species (GAO 1989).

Shaffer (1981) has pointed out that the threshold at which a species is defined as endangered is essentially a policy and not a science decision. These "policy" decisions are made on a species-by-species basis leading to decisions of endangerment that are not equitable across species. Courts, lacking scientific knowledge and specific biological criteria with which to judge decisions, typically defer to the expertise of the implementing agency (Rohlf 1991). Yet, if the agency were mandated to address a set of documented, objective, biological criteria within and across classes, and that criteria were then made available to the scientific community, the courts, and the public we may in fact effectively limit "arbitrary or frivolous" listing actions.

The GAO concludes their 1989 report on the spotted owl listing process by stating that these:

decisions can often be surrounded by highly emotional debates centered on the decision's possible economic consequences rather than its biological merits. In such cases, especially, the Service needs to be able to demonstrate that its review process and ultimate decisions have been as thorough, independent, and objective as possible.

The law mandates that determinations of endangerment be made "solely" upon scientific grounds. One of the great challenges to the endangered species program will be to restore the view that decisions are indeed based upon biological criteria rather than on political pressures (Bean 1991).

Politics, controlled by powerful economic interests, often determine which species are listed and which are not, and which listed species receive high attention (Noss 1991).

CHAPTER 2

PRIORITY GUIDELINES FOR SELECTING CANDIDATE AND PETITIONED SPECIES TO CONSIDER FOR LISTING AND FOR SELECTING LISTED SPECIES FOR RECOVERY ACTIONS

Introduction

Historical Perspective

Evolution of the Priority Guidelines. "Postponing a controversial decision because of competing political demands...reviewing 'safe' species over controversial ones delays action and is a concession to opposition interests" (Yaffee 1982).

Responding to increasing congressional and public concern over the possibility of discretionary action and recognizing that the Secretary did have complete discretion over which petitions to review and which recovery actions to implement, Congress amended the Act in 1979. By these amendments, the Secretary was required to publish, in the Federal Register (FR), guidelines for designating listing, delisting and recovery priorities for species. The House Committee on Merchant Marine and Fisheries, in its report attached to the bill that would become the 1982 ESA amendments, expressed its concern and its determination that:

the listing agencies...utilize a scientifically based priority list of species, subspecies and populations based on their degree of threat and proceed through that list in an efficient and timely manner. Distinctions based on whether the species is a higher or lower life form are not to be considered²² (cited in Bean 1983).

The priority guidelines were published in September of 1983.²³

Priority Guidelines Criteria. Priority guidelines for selecting species for listing consideration weigh three criteria (in order of importance): the magnitude of threat (high, moderate or low), the immediacy of threat (imminent or non-imminent) and taxonomic classification (monotypic genus, species or subspecies).

Species are ranked from 1-12 based on these 3 factors. Thresholds are not defined for magnitude or immediacy of threat. The Service simply states that, regarding magnitude of threat, "species facing the greatest threats to their continued existence would receive highest listing priority."²⁴

The Service states that the intent of their emphasis regarding the immediacy of threat criterion is to:

assure that species facing actual, identifiable threats are given priority over those for which threats are only potential or that are intrinsically vulnerable to certain types of threat but not known now to be facing such threats. In assigning a species to a priority category under immediacy of threat, the Service would consider the known occurrence (sic) or lack of documented detrimental trade or harvest, habitat modification, significantly detrimental disease or predation, and other potential threats.²⁵

Taxonomic considerations are:

intended to devote resources on a priority basis to those species representing highly distinctive or isolated gene pools, as reflected by the taxonomic level at which they are recognized....Taxonomy is included...as a crude reflection of genetic distinctness in an attempt to provide for the preservation of maximum genetic diversity in ecosystems.²⁶

Congress also requested (as mentioned above) that the Service develop and publish in the FR a priority system to guide the expenditures of available funds for the development and implementation of recovery plans (GAO 1988). Selecting species for recovery actions was initially based upon (in order of importance) degree of threat, recovery potential, taxonomic distinctness, and conflict with economic alternatives.²⁷ Species were ranked on a scale of 1-18 based on these 4 factors. In 1988, Congress amended the Act requiring that recovery plans be developed and implemented "without regard to taxonomic classification."²⁸ This amendment documents the intention of Congress that the Service consider species other than "charismatic megafauna" for recovery efforts. The amendment did not however change the emphasis upon magnitude of threat as the primary criterion for consideration of species for recovery efforts (Rohlf 1991).

The species with the highest degree of threat will have the highest priority for preparing and implementing recovery plans.... The high category means extinction is almost certain in the immediate future because of a rapid population decline or habitat destruction.... Within these categories (magnitude of threat: high, moderate or low)

priority will be given to those species that offer the greatest potential for success.²⁹

Because of the concern that too much time might be devoted to setting species priorities...the Service has deliberately attempted to formulate a system that is simple and that assigns species priorities in a straightforward manner without the need for complex analysis.³⁰

Discussion

There are several undefined terms in the Service explanation of 'immediacy of threat' which allow for flexible interpretation of that criterion. All threats are "potential" threats. There is no explanation as to what comprises an "actual, identifiable threat" versus a "potential" threat. Imminent threat is typically short-term as viewed from an anthropocentric perspective. This criterion ought to be defined and delimited recognizing a more expansive time-frame.

There are no thresholds delineating what is "significant" detrimental disease or predation. I would argue that the status and distribution of the species being considered will determine, to a great degree, the "significance" of disease or predation.

Private organizations have expressed concern about the lack of definitive priority guidelines. The Environmental Defense Fund (EDF) suggested that the Service define the terms in the proposed system more precisely and quantify the criterion "degree of threat" and "immediacy of threat."³¹

The Service responded that, with regard to defining the degree of threat, species circumstances were too "individualistic for precise quantification beyond the level proposed....An attempt to do so [quantify the criterion] might serve to make priority setting, rather than listing, the main activity of the program...."³²

With regard to immediacy of threat, the Service felt that quantification would render the system "unworkable."³³

In *North Slope Borough v. Andrus* (1979), the Federal defendants agreed that activities arising from offshore oil and gas leases could indeed harm protected whales in the area (plaintiffs were alleging violation of section 9). Yet, the government argued and the courts agreed that harm was not "sufficiently imminent or certain." No indication was given by the court regarding the degree of proof necessary to prove imminent harm³⁴ (cited in Rohlf 1989).

Imminently threatened candidate or petitioned monotypic genera receive highest priority for consideration for listing. The use of taxonomic classification as a means of recognizing those organisms that do exhibit phenotypic and/or genotypic uniqueness is reasonable. The preservation of biological diversity is furthered by focusing efforts on the conservation of unique species (Smith 1984).

The use of taxonomic classification as a criterion in ranking species for listing is not without its critics however. Entomologists argue that a "disproportionate number

of vertebrate compared to invertebrate species represent monotypic genera...and that this is a...serious and insidious policy... relegating invertebrates to the bottom of the priority list" (Murphy 1991).

To further exacerbate this sense of disparity, the determination of whether a group of organisms constitutes a population or a subspecies is not essential in order to list a vertebrate group (see definition of what constitutes a species in Appendix A) but is essential in order to list an invertebrate or a plant group. These organisms must be formally classified as species or subspecies to be considered for listing under the Act. While this legislated group-specific distinction impacts listing actions, the technical distinction between subspecies and populations is far from clear. Further, criteria which determine whether a group of organisms constitutes a population or a subspecies will vary depending on the specialists making the determination.

Murphy and Ehrlich ([1984] cited in Murphy 1991) define subspecies as "arbitrary geographical subdivisions of species delimited by variation of one, a few, or many characters." Given this definition, the systematist determines subspecific status by virtue of the characters he or she chooses to examine (Murphy 1991; Wilson 1992).

Taxonomic classification may need to be considered on a group-specific basis to allow equitable application of that criterion.

Contrary to Service opinion, the ranking of candidate and petitioned species according to their level of risk of extinction must be a "main activity." The specific goal of the listing process is to conserve high-risk species by affording them protection under the Act. "Species facing the greatest threats to their continued existence would receive the highest listing priority."³⁵ Species at high risk of extinction must receive listing consideration prior to those which are not.

There are over 4000 candidate species. We cannot accurately rank these species according to their risk of extinction based upon the broad guidelines now in force. The Service should select specific biological criteria which would enable assessment of the magnitude and imminence of threat facing candidate and petitioned species. These criteria should then be consistently addressed. The lack of systematic consideration of definitive biological criteria significantly impacts the scientific basis of the "priority list" of candidate and petitioned species to be considered for listing.

Service selection of species for allocation of recovery funds is currently coming under fire from both the private and the federal sector.

On average, the Service spent more on subspecies than on full species, more on species with a low recovery potential than on those with a high recovery potential, and, despite congressional instructions to the contrary, 14 times as much on 'charismatic megafauna' as on other types of species (Mann and Plummer 1991).

Congressional earmarking plays a part in the distribution and concentration of funds on particular species. However, discretionary funds are often inappropriately directed towards those species which have high public appeal. In 1986, 25% of discretionary recovery funds were spent on 4 species (Aleutian Canada goose, American peregrine falcon, southern sea otter, and the gray wolf). These species were determined to be facing only low to moderate threats across their listed ranges (GAO 1988).

The expenditure of recovery funds on species with high public appeal rather than on those which exhibit the highest degree of threat (as the recovery guidelines require), points out the fallible nature of the current system. "If the Service is unable or decides not to follow its priority system, the agency should amend as necessary and provide the public an opportunity to comment on the changes" (GAO 1988).

Scientists have recommended that umbrella, keystone or indicator species should have high ranking for receipt of recovery funds (Murphy 1991; Noss 1991). I do not disagree out of hand with these proposals, but suggest that formal incorporation of them into the guidelines may generate controversial quagmires over the definitive qualities of the categories and over the types of organisms which do or do not exhibit these qualities.

Controversies arising out of uncertainty can work against the goals of the recovery process by causing significant

delays. "Lack of information leads to scientific uncertainty which can serve as a reason for inaction" (Belsky 1984).

I would suggest that a multispecies strategy would be a most efficient, cost-effective and creative means of implementing the recovery sections of the Act. This would have the effect of remolding a species-by-species protection act into one allowing for multiple species protection.

Rather than emphasizing magnitude of threat (which plays the lead role in selecting species to consider for listing), as a criterion for selecting species for recovery actions, the Service might consider formally emphasizing suites of vulnerable species which occupy unique habitat and which seem to have a reasonable chance of recovery.

There are several unique multi-species communities currently represented by listed and/or candidate species for which joint recovery efforts are or could be beneficial. Associated listed and/or candidate species were mentioned in 48 of the final listings examined in Chapter 1. Thirty-nine of these final listings also included the number of associated endangered, threatened and/or candidate species. These values ranged from 1 to 13 vulnerable species which were associated with the species being listed.

Recovery criteria could be incorporated, into the priority guidelines, which could be effectively employed to protect unique and vanishing ecosystems that are hotspots of endemic species richness. The Service is already implementing

this strategy to some degree. When the priority guidelines were published in 1983 the Service had several recovery plans which considered multiple listed species. They included the following ecosystems: Antioch Dunes (3 species), Eureka Valley Dunes (2 species), Hawaiian forest birds (4 species), Hawaiian sea birds (4 species), Hawaiian water birds (3 species), NW Hawaiian Islands Passerine birds (3 species), Kauai forest birds (6 species), San Bruno Mountain (2 species), San Clemente Island (7 species), and the San Marcos River.³⁶

"Despite its focus on single species, the Act could play a significant role in protecting biodiversity on a broader scale" (Rohlf 1991). Unique communities with multiple listed and candidate species should receive high priority in the selection of species for recovery actions (O'Connell 1992). Recovery variables could focus on the collective properties of species richness and endemism (Scott et al. 1991; Noss 1991; Salwasser 1991; Reffalt 1991) and also upon the uniqueness of the occupied habitat.

Conclusion

The Service gives no indication, in the priority guidelines for selecting species for listing consideration, of what specific criteria they would consider in determining magnitude of threat and only a very general indication of what criteria they would consider to determine imminence of threat. There are also no clear indications of what specific criteria

the Service would consider to select particular species for recovery actions including what specific criteria the Service would use to determine "recovery potential."

The lack of systematic consideration of applicable, objective criteria suggests that the utilization of the listing and recovery priority guidelines as they now exist is an exercise in futility. The generality of these guidelines does not allow for the development of "scientifically based priority lists (sic) of species."

At the initial stage of the listing process then there is ambiguity and vagueness which is carried through and magnified in the remainder of the process. The Service should select specific biological criteria to assess imminence and degree of threat. Appropriate criteria, including criteria to assess "recovery potential," should also be chosen to select listed species for recovery actions. These criteria should then be consistently addressed.

It is important for the Service to develop definitive and objective systems to rank candidate and petitioned species for listing consideration and to select listed species for recovery actions. Such systems would allow for equitable comparisons across species and may impede discretionary action. If there are no set standards against which decisions can be judged, those decisions may indeed be "arbitrary and capricious."

NOTES

1. 16 U.S.C. §1531(a) and §1531(b).
2. *Id.* §1532(3).
3. *Id.* §1532(8).
4. Pub. L. No. 89-669, §1(b), 80 Stat. 926 (repealed 1973).
5. TVA vs. Hill, 437 U.S. §187 and §184 (1978).
6. *Id.* at n. 4.
7. Pub. L. No. 91-135, §3(a), 83 Stat. 275 (repealed 1973).
8. 16 U.S.C. §1533(b)(1)(A) and §1536(a)(2).
9. *Id.* §1533(a)(1).
10. *Id.* §1533(b)(1)(A)).
11. 46 Fed. Reg. 13193 (Feb. 19, 1981).
12. H.R. Rep. No. 567, 97th Cong., 2nd Sess. 20.
13. 16 U.S.C. §1532(6).
14. *Id.* §1533(d).
15. *Id.* §1538(a)(1).
16. 48 Fed. Reg. 43104 (Sept. 21, 1983).
17. *Id.*
18. 49 Fed. Reg. 34503 (Aug. 31, 1984).
19. 16 U.S.C. §1533(b)(3)(B) and §1533(b)(8).
20. 51 Fed. Reg. 17977 (May 16, 1986).
21. H.R. Rep. No. 382, 91st Cong., 1st Sess. 6.
22. H.R. Rep. No. 567, Pt. 1, 97th Cong. 2^d Sess. 21.
23. 48 Fed. Reg. 43098-43105 (Sept. 21, 1983).
24. *Id.* 43103.
25. *Id.*
26. *Id.* 43103 and 43099.
27. *Id.* 43103-43104.
28. 16 U.S.C. §1533(f)(1)(A).
29. 48 Fed. Reg. 43104 (Sept. 21, 1983).
30. *Id.* 43100.
31. *Id.*
32. *Id.*
33. *Id.*
34. 486 F. Supp. 326 (D.D.C. 1979), *aff'd & rev'd*, 642 F.2^d 610 (1980).
35. 54 Fed. Reg. 43967 (Oct. 30, 1989)
36. 48 Fed. Reg. 43101 (Sept. 21, 1983).
37. 16 U.S.C. §1532(16).
38. 16 U.S.C. §1362(10).
39. 50 C.F.R. §424.11(a).
40. 16 U.S.C. §1533(b)(3)(A)
41. 50 C.F.R. §424.14(b)(1).
42. *Id.* at n. 54.
43. 50 C.F.R. §424.14(b)(2).
44. *Id.* at n. 54.
45. H.R. Conf. Rep. No. 835, 97th Cong., 2nd Sess. 19.
46. *Id.* at n. 12.
47. 50 C.F.R. §424.11(b) and §424.11(c).
48. *Id.* §424.11(d).

49. 16 U.S.C. §1533(b)(3)(B)(i-iii).
50. *Id.* §1533 (b)(3)(C)(ii).
51. 50 C.F.R. §424.14(b)(3)(iii)(A).
52. 16 U.S.C. §1533 (b)(3)(B)(i).
53. *Id.* §1533(b)(3)(B)(ii).
54. 50 C.F.R. §424.16(c)(2).
55. *Id.* §424.16(c)(3).
56. 50 C.F.R. §424.17(a)(iii).
57. *Id.* §424.17(a)(iv).
58. *Id.* §424.17(a)(i).
59. *Id.* §424.11(b).
60. 16 U.S.C. §1533(b)(7).
61. *Id.* §1533(b)(7).
62. *Id.* §1533(b)(7)(A).
63. *Id.* at n. 74.
64. *Id.*
65. 16 U.S.C. §1533(b)(3)(C)(iii).
66. 46 Fed. Reg. 13193 (Feb. 19, 1981).
67. 50 C.F.R. §17.11 and supplement (July 15, 1991).
68. *Id.*
69. *Id.*
70. 56 Fed. Reg. 58805 (Nov. 21, 1991).
71. 50 C.F.R. §17.11 and §17.12 (July 15, 1991).
72. 54 Fed. Reg. 149 (Aug. 4, 1989).
73. *Id.*
74. 55 Fed. Reg. 46515-46523 (Nov. 5, 1990).
75. 50 C.F.R. §424.02(b).
76. *Id.* at n. 84.
77. *Id.*
78. *Id.*
79. 56 Fed. Reg. 58804 (Nov. 21, 1991).
80. 16 U.S.C. §1533(b)(3)(C)(iii).
81. 56 Fed. Reg. 58804-58836 (Nov. 21, 1991).
82. 55 Fed. Reg. 6184-6229 (Feb. 21, 1990).
83. *Id.*
84. *Id.* at n. 95.
85. 56 Fed. Reg. 58805 (Nov. 21, 1991).

LITERATURE CITED

- Bean, M.J. 1983. The evolution of national wildlife law. Praeger Publishers, New York.
- Bean, M.J. 1991. Looking back over the first fifteen years. Pages 37-42 in K. Kohm, editor. Balancing on the brink of extinction: the Endangered Species Act and lessons for the future. Island Press, Washington, D.C.
- Belsky, M.H. 1984. Environmental policy law in the 1980's: shifting back the burden of proof. Ecology Law Quarterly 12(1):1-88.
- Breiman, L., J.H. Friedman, R.A. Olshen, C.J. Stone. 1984. Classification and regression trees. Wadsworth & Brooks, Pacific Grove, California.
- Chan, L.S. 1972. Treatment of missing values in discriminant analysis. I. Sampling experiment. J. Am. Stat. Assoc. 67:473-477.
- General Accounting Office. 1988. Endangered species: management improvements could enhance recovery program. Report RCED-89-5.
- General Accounting Office. 1989. Endangered species: Spotted owl petition beset by problems. Report No. RCED-89-79.
- Latin, H.A. 1982. The "significance" of toxic health risks: an essay on legal decisionmaking under uncertainty. Ecology Law Quarterly 10:339-395.
- Mace, G.M., and R. Lande. 1991. Assessing extinction threats: towards a reevaluation of IUCN threatened species categories. Conservation Biology 5(2):148-157.
- Mann, C.C., and M.L. Plummer. 1992. The butterfly problem. The Atlantic Monthly 269(1):47-70.
- Mardia, K.V., J.T. Kent, and J.M. Bibby. 1979. Multivariate analysis. Academic Press, New York. 412 pp.
- Murphy, D.D. 1991. Invertebrate Conservation. Pages 181-198 in K. Kohm editor. Balancing on the brink of extinction: the Endangered Species Act and lessons for the future. Island Press, Washington, D.C.
- Murphy, D.D. 1992. Scientists and Endangered Species Act reauthorization. Endangered Species Update 9(4):10.

- Murphy, D.D., and B.R. Noon. 1991. Exorcising ambiguity from the Endangered Species Act: critical habitat as an example. *Endangered Species Update* 8(12):6.
- Norusis, M.J. 1985. *SPSS^x Advanced Statistics Guide*. McGraw-Hill Book Company, New York. 505pp.
- Noss, R.F. 1991. From endangered species to biodiversity. Pages 227-246 in K.Kohm editor. *Balancing on the brink of extinction: the Endangered Species Act and lessons for the future*. Island Press, Washington, D.C.
- Nowak, R.M., and J.L Paradiso, editors. 1983. *Mammals of the World*. Johns Hopkins Press, London. 1377pp.
- O'Connell, M. 1992. Response to: "Six biological reasons why the Endangered Species Act doesn't work and what to do about it". *Conservation Biology* 6(1):140-143.
- Reffalt, W. 1991. The endangered species lists: chronicles of extinction? Pages 77-85 in K.Kohm editor. *Balancing on the brink of extinction: the Endangered Species Act and lessons for the future*. Island Press, Washington, D.C.
- Rohlf, D.J. 1989. *The Endangered Species Act: a guide to its protections and implementation*. Stanford Environmental Law Society, Stanford, CA. 207pp.
- Rohlf, D.J. 1991. Six biological reasons why the Endangered Species Act doesn't work--and what to do about it. *Conservation Biology* 5(3):273-282.
- Sagoff, M. 1987. Where Ickes went right or reason and rationality in environmental law. *Ecology Law Quarterly* 14:265-323.
- Salwasser, H. 1991. In search of an ecosystem approach to endangered species conservation. Pages 247-265 in K.Kohm editor. *Balancing on the brink of extinction: the Endangered Species Act and lessons for the future*. Island Press, Washington, D.C.
- Scott, J.M., B. Csuti, K. Smith, J.E. Estes, S. Caicco. 1991. Gap analysis of species richness and vegetation cover: an integrated biodiversity conservation strategy. Pages 282-297 in K.Kohm editor. *Balancing on the brink of extinction: the Endangered Species Act and lessons for the future*. Island Press, Washington, D.C.
- Shaffer, M.L. 1981. Minimum population sizes for species conservation. *BioScience* 31(2):131-134.

- Smith, E.M. 1984. The Endangered Species Act and biological conservation. *Southern California Law Review* 57:361-413.
- Sokal, R.R., and F.J. Rohlf. 1981. *Biometry: the principles and practice of statistics in biological research*. W.H. Freeman and Company, New York. 859 pp.
- Tear, T., M. Scott, P. Hayward. in press. Recovery plans and the Endangered Species Act: Taking the low road to recovery? *Conservation Biology*.
- United States Fish & Wildlife Service. 1989. Two Utah plants proposed for delisting. *Endangered Species Technical Bulletin* XIV (1&2):12.
- Webster, R.E. 1987. Habitat conservation plans under the Endangered Species Act. *San Diego Law Review* 24(1):243-271.
- Wilcove, D.S., M. McMillan, K.C. Winston. 1993. What exactly is an endangered species? An analysis of the U.S. endangered species list: 1985-1991. *Conservation Biology* 7(1):87-93.
- Wilson, E.O. 1992. *The diversity of life*. The Belknap Press of Harvard University Press, Cambridge, Massachusetts. 424 pp.
- Yaffee, S.L. 1982. *Prohibitive policy*. Massachusetts Institute of Technology, Cambridge, MA. 239pp.

STATUTES CITED

Endangered Species Protection Act of 1966, Pub. L. 89-669, 80 Stat. 926, Oct. 15, 1966 (repealed 1973)

Endangered Species Conservation Act of 1969, Pub. L. 91-135, 83 Stat. 275, Dec. 5, 1969 (repealed 1973)

Endangered Species Act of 1973, Pub. L. 93-205, 81 Stat. 884, Dec. 28, 1973; current version at 16 U.S.C. at 1531-1543

Endangered Species Act Amendments of 1978, Pub. L. 95-632, 92 Stat. 3751, Nov. 10, 1978

Endangered Species Act Amendments of 1982, Pub. L. 97-304, 96 Stat. 1411, Oct. 13, 1982

Endangered Species Act Amendments of 1988, Pub. L. 100-478, 102 Stat. 2306, 1988

Lacey Act, 16 U.S.C. at 701, 3371-3378, and 18 U.S.C. at 42

Migratory Bird Treaty Act, 16 U.S.C. at 703-711

Fish and Wildlife Coordination Act, 16 U.S.C. at 661-667e

Marine Mammal Protection Act, 16 U.S.C. at 1361-1407

INTERNATIONAL TREATIES

Convention on International Trade in Endangered Species of Wild Fauna and Flora, March 3, 1973, 27 U.S.T. 1087, T.I.A.S. No. 8249

APPENDICES

APPENDIX A
PROCEDURAL ASPECTS OF THE LISTING PROCESS

When confronted by uncertainty in the course of a scientific investigation, the systematic response of a scientist is suspension of judgment pending the acquisition of more data and the development of testable hypotheses. In science, 'no decision' can mean just that. In legal disputes, however, 'no decision' perpetuates the status quo and ordinarily promotes some interests at the expense of others (Latin 1982).

PROCEDURAL ASPECTS OF THE LISTING PROCESS

"Authority to list species as endangered or threatened resides exclusively with the Secretary of Interior and the Secretary of Commerce" (Bean 1983). Implementation of the Act is overseen by the United States Fish & Wildlife Service (the Service) and the National Marine Fisheries Service (NMFS). Regulations issued by these two agencies govern how the Act is officially interpreted, how terms in the Act are defined and how the Act is brought into play (Rohlf 1991).

The procedural aspects of the listing process itself are well detailed and involve definitive time allotments for four identified decision points (Fig. 2).

Any individual, within or outside of the respective implementation agencies, or any organization may petition to list, delist or reclassify a species.

"Species" is defined as including "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature."³⁷ The idea of protecting distinct population

Fig. 2. Diagram of the listing process.

INITIATION OF THE PROCESS

A petition to list, delist or reclassify is submitted from within or outside the implementing agency.

DECISION POINT I

Within 90 days, the decision is made as to whether a petition represents substantial information or not. There are two alternative actions.

Action 1

Petition does not represent substantial information. Notify petitioner of petition rejection. Publish finding in FR.
XXXXXXXXXXXXXX

Action 2

Petition represents substantial information. Review status of species. Publish finding in FR.

DECISION POINT II

Within 12 months, the decision is made as to whether the petitioned action is warranted. Two actions are associated with this decision.

Action 1

Petitioned action is not warranted. Publish finding and notify petitioner.
XXXXXXXXXXXXXX

Action 2

Petitioned action is warranted. Publish finding.

DECISION POINT III

A positive finding for Decision II leads to the third decision as to whether the petitioned action should be formally proposed immediately. There are three actions associated with this decision.

Action 1

Petitioned action is precluded by other pending proposals to list, delist or reclassify. Publish notice in FR.

Action 2

Available evidence does not justify proposing the action at the time. Publish notice of review in FR.

Action 3

Publish proposed rule to implement the action to list (as endangered or threatened), delist, or reclassify a species in FR. Public Comments.

DECISION POINT IV

Within 12 months of publication of the proposed rule the fourth decision is made as to whether to formally list the species as endangered or as threatened, not list the species, delist, or reclassify the species. There are three alternative actions associated with this decision.

Action 1

Evidence does not justify proposed action. Withdraw proposed rule and publish notice in FR.
XXXXXXXXXXXXXX

Action 2

Disagreement regarding data relevant to proposed action persists. Publish notice of 6 month extension in FR.

Action 3

Publish a final rule to implement the proposed action.

segments derives from the Marine Mammal Protection Act (MMPA). The MMPA (1976) defines "population stock...as a group of marine mammals of the same species or smaller taxa in a common spatial arrangement, that interbreeds when mature."³⁸ There is no formal definition of "distinct population segment" in the ESA.

Any species or taxonomic group of species (e.g., genus, subgenus) ...is eligible for listing...A taxon of higher rank than species may be listed only if all included species are individually found to be endangered or threatened. In determining whether a particular taxon or population is a species for the purposes of the Act, the Secretary shall rely on standard taxonomic distinctions and the biological expertise of the Department and the scientific community concerning the relevant taxonomic group.³⁹

"The importance of any species is clear from the facts of Hill: the snail darter is one of almost 100 species of darters, 45 of which inhabit the rivers of Tennessee, the site of Tellico Dam" (Webster 1987).

The vast majority of species are petitioned and that process is outlined here.

Decision Point I

In an amendment to Section 4 (1982), Congress required the Secretary to respond to petitions within 90 days of their receipt. This was in response to growing congressional and public concern that many petitions had been in holding patterns for years (Fig. 3). The first decision then is the determination of whether a petition to list, delist or

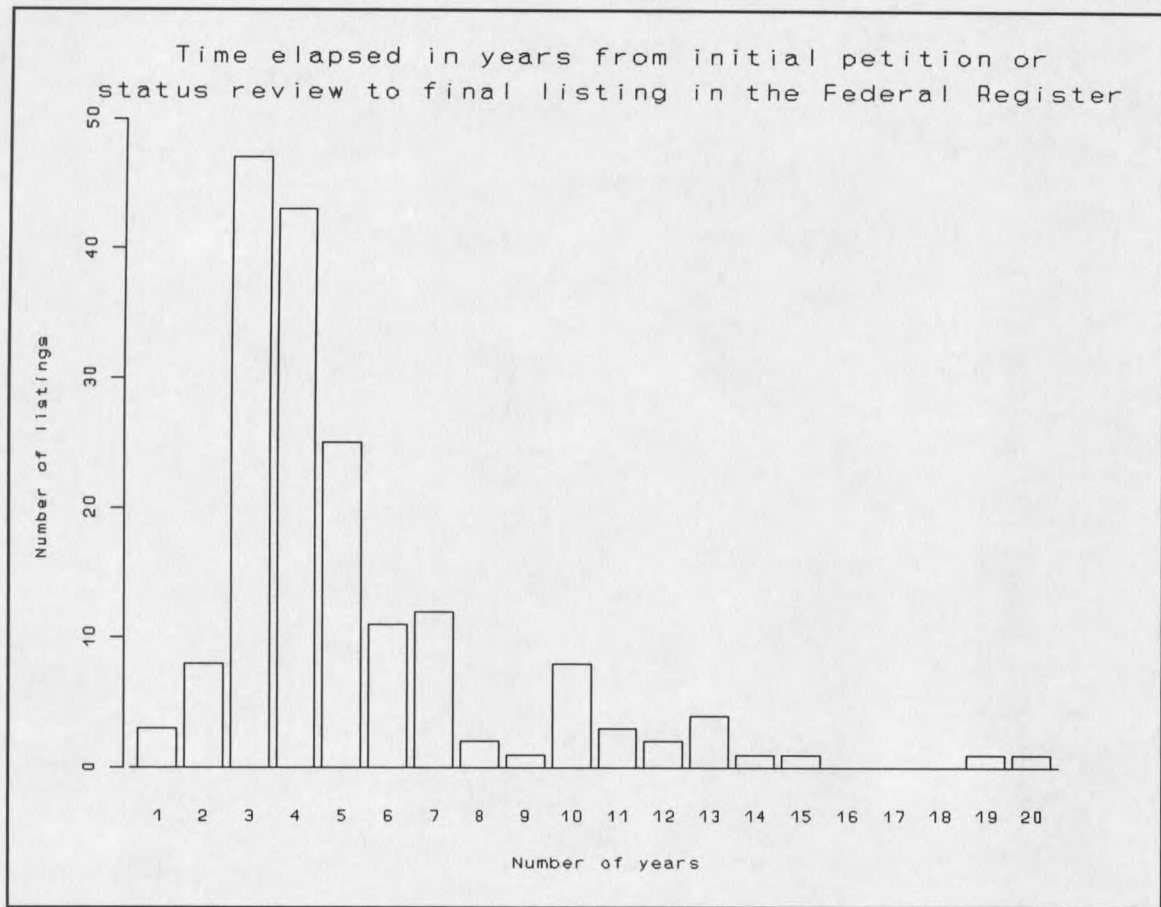


Figure 3. Time elapsed in years from the initial petition or status review (published in the Federal Register) to publication of the final rule in the Federal Register. Missing values for an initial date of consideration = 99.

reclassify a species presents "substantial scientific or commercial information indicating that the petitioned action may be warranted...."⁴⁰ 'Substantial information' is "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted."⁴¹

What constitutes a "reasonable person" is unclear. The Secretary, apparently able to discern this, has 90 days ("to the maximum extent practicable"⁴²) to make a determination as to whether the petition may be warranted. By addition of the phrase "to the maximum extent practicable" the Secretary still retains discretion regarding petition time constraints. Due to this phrase, the Secretary's failure to meet the 90-day time limit is not a procedural violation of section 4 (Rohlf 1989).

The Secretary determines whether the petition is warranted by considering whether the petition:

- (1) Clearly indicates the administrative measure recommended [to list as endangered or as threatened; to delist; or to reclassify from endangered to threatened (downlist), or from threatened to endangered (uplist)] and gives the scientific and common names;
- (2) Contains detailed narrative justification for the recommended measure, describing, based on available information, past and present numbers and distribution of the species involved and any threats to the species;
- (3) Provides information regarding the status [status is undefined] of the species over all or a significant portion of its range; and
- (4) [Is] Accompanied by appropriate supporting documentation...⁴³

"If such a petition is found to present such information, the Secretary shall promptly commence a review of the status of the species concerned. The Secretary shall promptly publish each finding ...in the FR."⁴⁴

Information on potential economic impact is not required to be considered or presented in the petition⁴⁵ (cited in Rohlf 1989). "Applying economic criteria to...any phase of the species listing process is applying economics to the determinations made under section 4 of the Act and is specifically rejected by the inclusion of the word "solely" in this legislation."⁴⁶

Decision Point II

The second decision point encountered in the listing process (given a finding that the petition may be warranted) is the determination of whether the petitioned action to list, delist or reclassify is warranted. The Secretary must make this decision within 12 months of the initial receipt of the petition and must make the decision:

solely on the basis of the best available scientific and commercial information regarding a species' status...that the species is endangered or threatened because of any one or a combination of the following factors:

- (1) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (2) Over-utilization for commercial, recreational, scientific, or educational purposes;
- (3) Disease or predation;

- (4) The inadequacy of existing regulatory mechanisms; or
- (5) Other natural or manmade factors affecting its continued existence.⁴⁷

When considering the delisting of a species, the Secretary must also determine that a species is no longer threatened or endangered because of any of the following reasons:

- (1) Extinction. Unless all individuals of the listed species had been previously identified and located, and were later found to be extirpated from their previous range, a sufficient period of time must be allowed before delisting to indicate clearly that the species is extinct. [Sufficient time is not defined].
- (2) Recovery. A species may be delisted on the basis of recovery only if the best scientific and commercial data available indicate that it is no longer endangered or threatened.
- (3) Original data in error. Subsequent investigations may show that the best scientific or commercial data available when the species was listed, or the interpretation of such data was in error.⁴⁸

The problem of determining whether a species is indeed extinct is illustrated by the ivory billed woodpecker and the Rydberg milk-vetch among others. A population of woodpeckers was discovered in the hills of Cuba after 3 decades of no known verified sightings (Reffalt 1991). The Rydberg milk vetch was collected in 1905 and then recognized as a species from museum specimens. It was rediscovered in the wild in 1976 and listed as threatened in 1978 with two known populations remaining (Rohlf 1989). It was delisted in 1989 because it was considered to be recovered.

All decisions will be immediately published in the FR.⁴⁹ A negative finding...that the petition is not warranted or that the petition is warranted but precluded by other listing activity (see Decision III below) is subject to judicial review.⁵⁰

Decision Point III

If a petitioned action is found to be warranted by virtue of the above criteria, a third decision must be addressed. This decision is the determination of whether the petitioned action should be formally proposed immediately.

...in response to political pressure: decisions may be sped up or slowed down...changing the rate of decisionmaking has substantive effects... delay, for example, is often a decision in favor of the status quo" (Yaffee 1982).

There are two alternatives available to the Secretary if he elects not to formally propose the species for listing action immediately. He may delay the formal listing proposal by publishing, in the FR, that the "petitioned action is precluded because of other pending proposals to list, delist, or reclassify."⁵¹

There is a 12 month time allotment after the publication of this decision. At the end of that period, the petition is again considered under Decision Point II. Alternatively, the Secretary may decide, and publish in the FR, that "the petitioned action is not warranted."⁵² If the Secretary decides to propose the petitioned action immediately, he does

so by authoring and publishing a formal rule of proposal in the FR.⁵³ Sixty days shall then be allowed for public comments.⁵⁴ If a public hearing is requested within 45 days of publication of a proposed rule at least one must be held.⁵⁵

Decision Point IV

The fourth decision, whether to formally list a species as endangered or threatened, to delist a species, to reclassify a species, or not to list a species, must be made within 12 months of publication of a formal rule of proposal. There are three alternative actions available to the Secretary. He may publish notice of withdrawal of the proposed rule upon finding that "available evidence does not justify the action proposed by the rule."⁵⁶ He may publish notice of the need to extend the allotted 12 month period by 6 months because of disagreement among scientists "regarding the accuracy and sufficiency of the data relevant to the action proposed."⁵⁷ He also may elect to publish a final rule to implement the proposed action⁶⁶

The Secretary must consider the five factors listed under Decision Point II above and shall make the listing decision:

solely on the basis of the best available scientific and commercial information regarding a species' status, without reference to possible economic or other impacts of such determination.⁵⁹

Emergency Listing Procedures

None of the aspects of the listing process, as outlined above, are to be considered if the Secretary determines that there is an "emergency posing significant risk to the well-being of any species of fish, wildlife or plants."⁶⁰ Application of emergency rules initially applied only to wildlife but the amendments of 1979 extended emergency listing procedures to plants as well. (Bean 1983).

The emergency rule takes effect immediately upon its publication in the FR.⁶¹ The Secretary must, at that time, publish the reasons for the emergency listing.⁶² There are however no established rules for the Secretary to follow in determining whether or not there is an "emergency posing significant risk" to any particular species. An emergency rule remains in effect for 240 days.⁶³ The species can then be formally listed if the process has reached completion.⁶⁴

The 1988 amendments to Section 4 further require the Secretary to engage the "prompt use of the emergency listing procedures to prevent a "significant risk to the well-being of any [candidate species]."⁶⁵ "Interested parties now may attempt to compel the Secretary to use emergency listing procedures in specific instances. Such cases will turn upon whether the species involved faces a significant risk to its well-being, a phrase the Act does not define" (Rohlf 1989).

APPENDIX B
PROFILE OF LISTED AND CANDIDATE SPECIES

Great biological diversity takes long stretches of geological time and the accumulation of large reservoirs of unique genes. The richest ecosystems build slowly, over millions of years. It is further true that by chance alone only a few new species are poised to move into novel adaptive zones, to create something spectacular and stretch the limits of diversity. A panda or a sequoia represents a magnitude of evolution that comes along only rarely. It takes a stroke of luck and a long period of probing, experimentation, and failure. Such a creation is part of deep history, and the planet does not have the means nor we the time to see it repeated. (E. O. Wilson 1992).

LISTED AND CANDIDATE SPECIES

Listed Species

Because of low staff numbers and resources the Service expects to list approximately 50 species per year (USFWS 1989).

Figure 4 presents an annual tally of species listings from 1967 through 1991. The first listing peak occurred in 1970 after passage of the 1969 Act which authorized the Secretary to develop a list of species threatened with extinction on a worldwide scale (Bean 1983). The second peak occurs in 1976 after publication of the first notice of review on plants in 1975. The listing lows occurred during the Johnson and Nixon administrations immediately prior to passage of the 1969 Act (Johnson) and prior to and post passage of the 1973 Act (Nixon). The next chronological low point occurred during the Reagan administration with passage of Executive

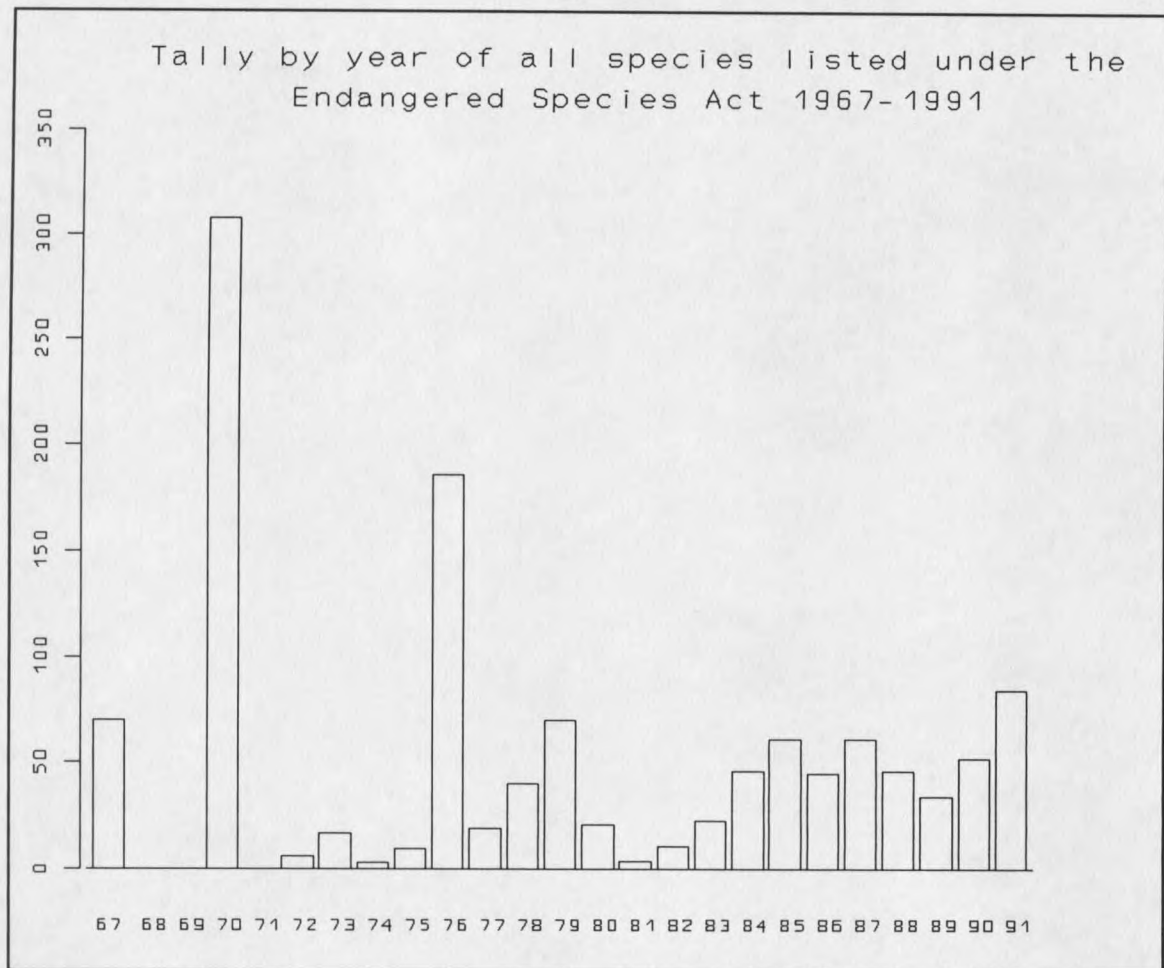


Figure 4. Tally of species protected under the Endangered Species Act by the year in which they were listed. This does not include reclassifications.

Order 12291⁶⁶ which required consideration of economic impacts in the listing process. This was repealed by Congress in 1982 (see Chapter 1).

As of July 15, 1991, 1,209 species (335 mammals, 310 plants, 239 birds, 112 reptiles, 100 fish, 44 clams, 23 insects, 19 amphibians, 14 snails, 10 crustaceans, and 3 arachnids) had been officially listed as endangered or threatened under the Act⁶⁷. The vast majority of vertebrate and plant species are listed as endangered (Fig. 5). A majority of invertebrates are also listed as endangered. All the arachnids are listed as endangered; 8 of 10 crustaceans are endangered; 8 of 14 snails are endangered; 42 of 44 clams are endangered; and 14 of the 23 listed insects are endangered.

Figure 6 profiles listed domestic and listed foreign endangered and threatened species from 1975-1991. The majority of foreign listed species are endangered mammals (64) whereas endangered foreign birds, reptiles and fish all number fewer than 15.

Delisting Actions

There have been 16 delisting actions as of July 15, 1991. Seven of these were the result of a species being declared extinct, 5 were because the original data was in error and 4 were because the species had recovered.⁶⁸ The 7 listed species that have been formally declared as extinct are: the Tecopa

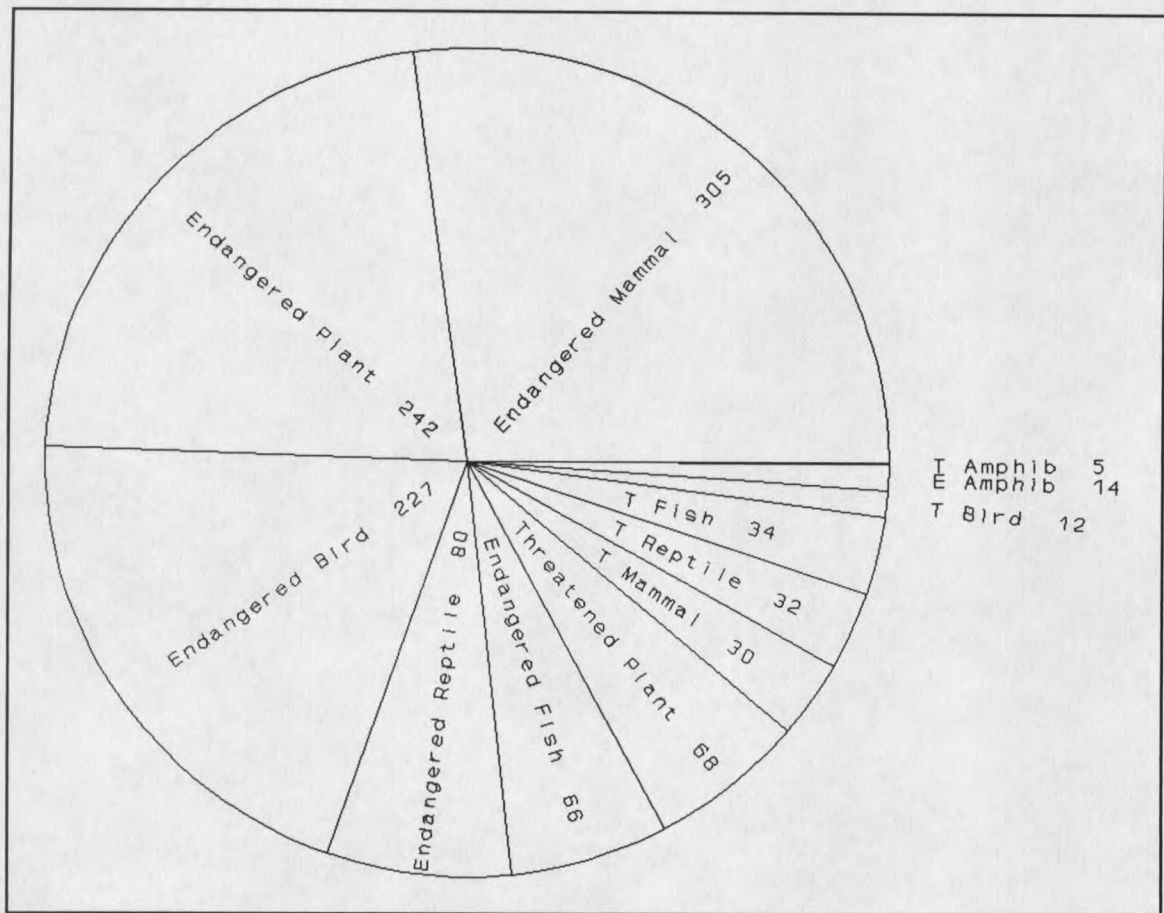


Figure 5. Numbers per group of listed vertebrates and plants.

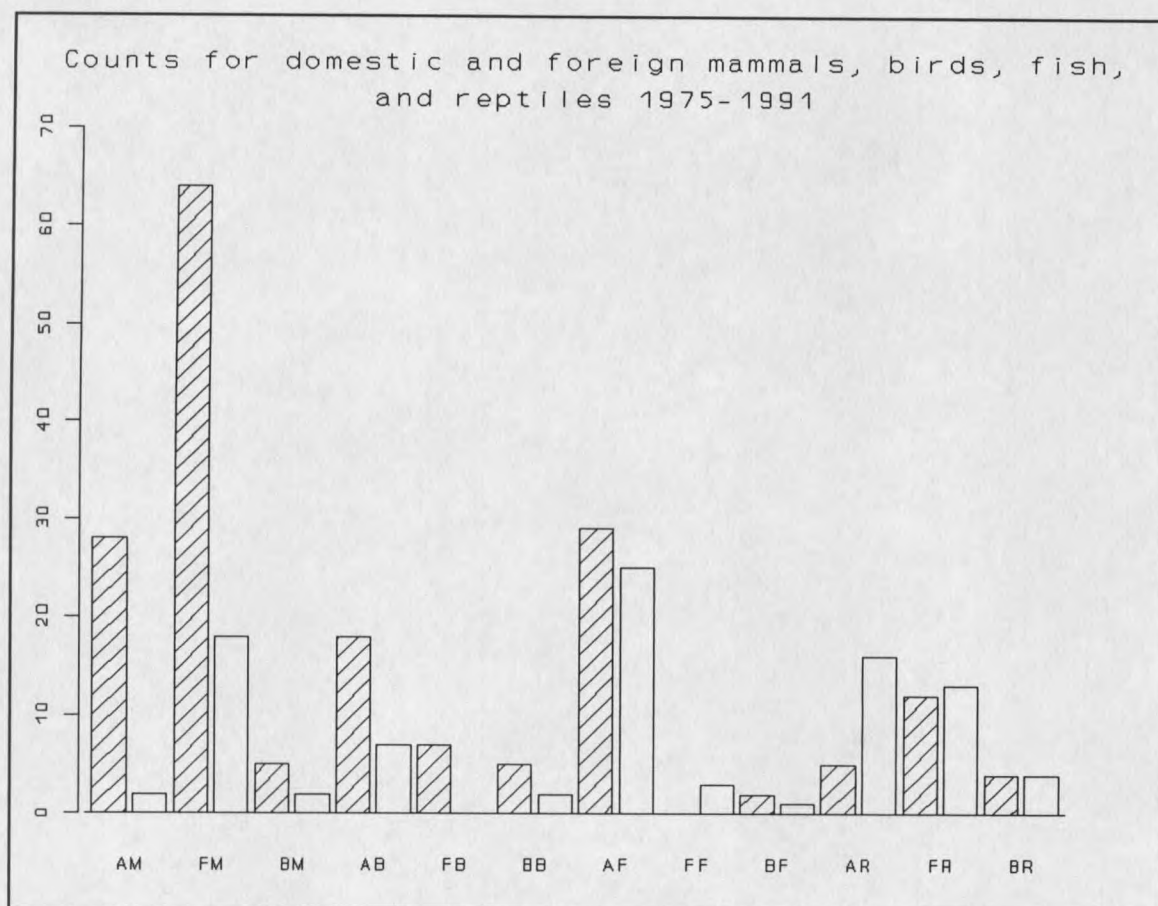


Figure 6. Counts of endangered (////) and threatened (blank) foreign and domestic mammals, birds, fish, and reptiles (considered in this study) January 1, 1975 - July 15, 1991. This does not include species listed on July 14, 1976 (for which no data was provided). AM=domestic mammal, FM=foreign mammal, BM=both, AB=domestic bird, FB= foreign bird, BB= both, AF=domestic fish, FF=foreign fish, BF=both, AR=domestic reptile, FR=foreign reptile, BR=both.

pupfish, longjaw cisco, blue pike (extinct due to hybridization), Santa Barbara song sparrow, Sampson's pearly mussel (thought to be extinct before they were listed), Amistad gambusia, and the dusky seaside sparrow.⁶⁹

There are several other listed species that may be extinct including the Marianas mallard, the Mariana fruit bat, Scioto madtom, the giant anole, the turgid-blossom mussel, the yellow-blossom mussel, the Palos Verde blue butterfly, and the eastern cougar. The Service has stated that taxa which have been designated as extinct "if rediscovered...might acquire high priority for listing."⁷⁰

Emergency Listing Actions

Up until July 15, 1991 only 11 species (4 mammals, 3 fish, 2 birds, 1 reptile, and 1 plant) had been emergency listed.⁷¹ I promote regular and prompt use of the emergency rule process to protect and jettison to the head of the candidate queue those unlisted species which are the most extinction prone.

The condition of some of the above populations at the time of their emergency listing follows: The woodland caribou population, within the areas specified above, comprised less than 30 individuals and was threatened by continued loss of habitat. The endemic Key Largo wood rat and cotton mouse were both threatened by continued development and destruction of their unique upland hardwood hammock habitat. The endemic

Guam rail had become confined to a very small portion of that island because of habitat destruction. There were less than 100 birds remaining in several discontinuous groups. A major threat to their continued existence persisted from the exotic, predatious brown tree snake. (At the time of the emergency listing of the rail there were two other endemic birds on Guam which had less than 100 individuals remaining. These birds were also threatened by the brown tree snake but were not emergency listed.) The speckled dace and the Amargosa pupfish were cumulatively threatened by proposed development, exotic predators and hybridization.

The Sacramento river winter-run chinook salmon also received protection under the Act from an emergency ruling.⁷² Trends of salmon abundance had declined from a 3 year average of 84,000 (1967-1969) to a 3 year average of 2,000 (1982-1984). The NMFS declined to consider the salmon for listing because of ongoing restoration and conservation efforts which they believed would rebuild the population. The 1989 run comprised 550 individuals and was listed as endangered under California state law. The NMFS belatedly listed the salmon under emergency rule as a threatened species on August 4, 1989.⁷³ The 1990 run declined to a new low of 441 individuals. The salmon was federally listed as a threatened species on November 5, 1990.⁷⁴

Candidate Species

The definition of a "candidate" species is "any species being considered by the Secretary for listing as an endangered or a threatened species, but not yet the subject of a proposed rule."⁷⁵

A "category 1" candidate species is one for which:

The Service has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species. Proposed rules have not yet been issued because this action is precluded at present by other listing activity. Development and publication of proposed rules on category 1 taxa are anticipated...⁷⁶

A "category 2" candidate species is one for which the Service has information which indicates that "proposing to list [a species] as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules."⁷⁷

"Category 3" species "once were considered for listing...but are no longer under such consideration...."⁷⁸ These species are no longer candidates for listing as endangered or threatened under the Act. There are 3 subcategories under this classification (see below).

It is not at all clear how the Service determines classification of category 1 or 2 species. There are no

explicit thresholds for selecting between these two alternative classifications.

According to one Service source, these two categories evolved as a result of the tremendous number of plants which were jointly petitioned after Congress added protection of plants to the Act. Congress had requested that Smithsonian scientists come up with a list of plants to consider for listing. These scientists produced a list of 3000 plants all of which the Service immediately placed under petition. A notice of review of these plants was published in 1975. In 1980, these plants were subdivided into 2 categories, Category 1 and 2 by a "bunch of guys sitting around a table" who then defined (after the fact) what those categories were. In 1983, notices of review (or candidate lists) were also published for vertebrates and invertebrates.

Unless a candidate species was the subject of a published proposed or final rule determining endangered or threatened status there has been no substantive or procedural protection for them under the Act.⁷⁹ However, with the 1988 amendments, Congress demonstrated its concern for the conservation of all species by noting that numerous candidate species were experiencing serious declines in numbers and some had become extinct before protection could be implemented (Rohlf 1989). Section 4 was amended⁸⁰ to require the Secretary to monitor species which were not yet listed but which warranted listing (Rohlf 1989). Identifying candidates in regular notices of

review allows Federal agencies to consider the requirements of these species when planning agency activities (USFWS 1989).

Profile of Candidate Species

Animal and plant candidate species through 11/21/91⁸¹ and 2/21/90 respectively total 4,122 species (Table 15). This total includes 221 3a species (see definition below), 39 proposed endangered species and 19 proposed threatened species. By definition the proposed species are no longer "candidate" species but are included here because they are not yet listed. The vast majority of candidate species are plants and invertebrates (Fig. 7). Insects and gastropods make up the majority of the candidate invertebrates (Fig. 8).

Category 3 includes 1,990 plant taxa⁸² and 337 animal taxa.⁸³ Subcategory 3a consists of 221 plant and animal taxa the Service now believes are extinct (Fig. 9 and Appendix E). Subcategory 3b contains 759 taxa that the Service believes do not meet the Act's legal definition of species; it "also includes vertebrate populations that do not meet this definition."⁸⁴ Subcategory 3c is comprised of 1,347 taxa which current information indicates are more abundant and/or widespread than once thought.⁸⁵

Table 15. Animal and plant candidate species (through 11/21/91 and 2/21/90 respectively). PE=species currently proposed to be listed as endangered, PT=species currently proposed to be listed as threatened, 3A=species now thought to be extinct (7 were listed species).

	CANDIDATE SPECIES					
	1	2	PE	PT	3A	TOTAL
<u>VERTEBRATES</u>						
Birds	6	68	0	1	6	81
Fish	15	143	1	4	17	180
Reptiles	5	65	0	0	3	73
Mammals	14	198	2	1	9	224
Amphibians	5	55	0	0	2	62
<u>INVERTEBRATES</u>						
Bivalvia	2	59	8	3	12	84
Diplopoda	0	1	0	0	0	1
Gastropoda	13	270	9	0	3	295
Insecta	11	653	0	1	71	736
Arachnida	0	35	0	0	0	35
Crustacea	6	107	2	0	2	117
Oligochaeta	0	1	0	0	0	1
Turbellaria	0	6	0	0	2	8
Cnidaria	0	1	0	0	0	1
Porifera	0	5	0	0	0	5
<u>PLANTS</u>	527	1572	17	9	94	2219
Total:	604	3239	39	19	221	4122

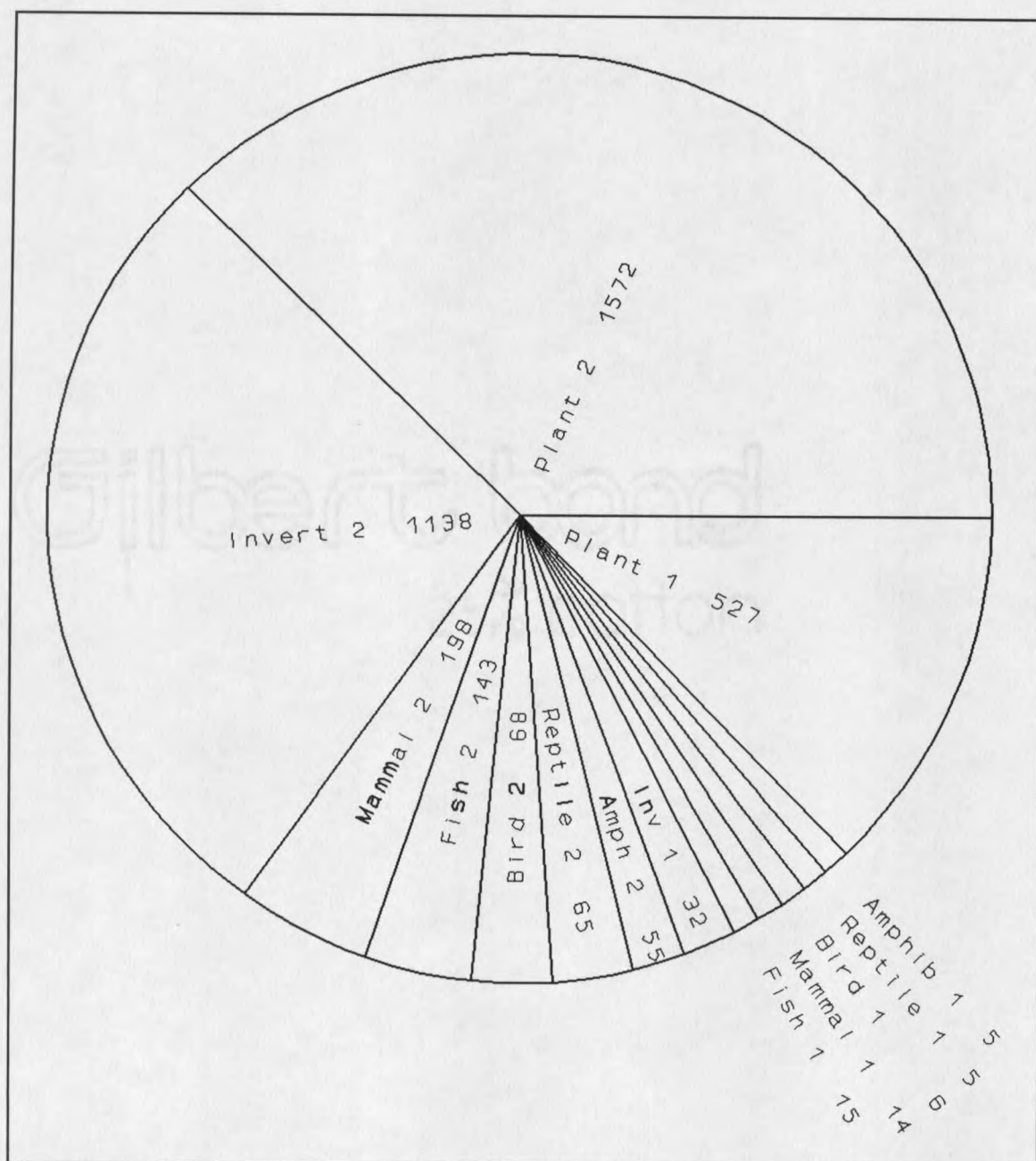


Figure 7. Candidate 1 and 2 species tallied through 11/21/91 for animals and 2/21/90 for plants.

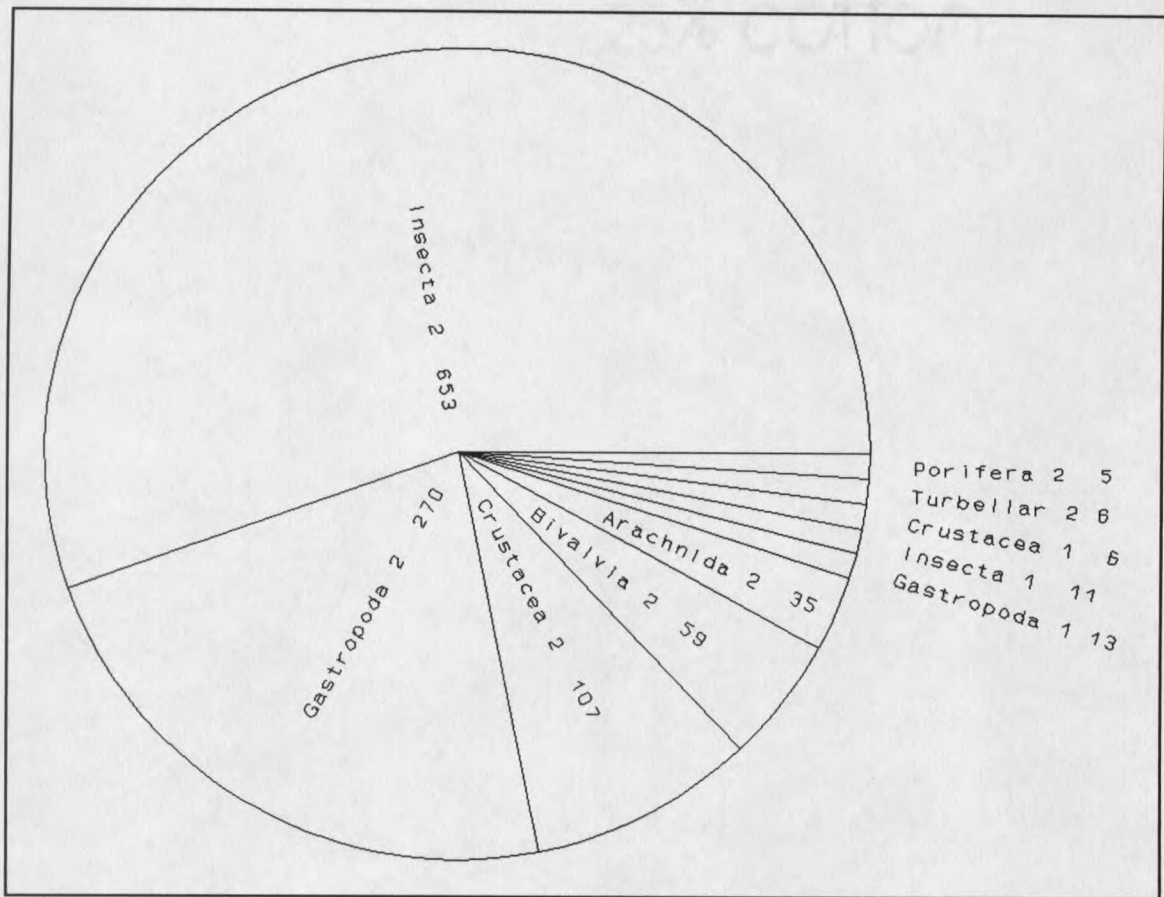


Figure 8. Candidate 1 and 2 invertebrate species tallied through 11/21/91.

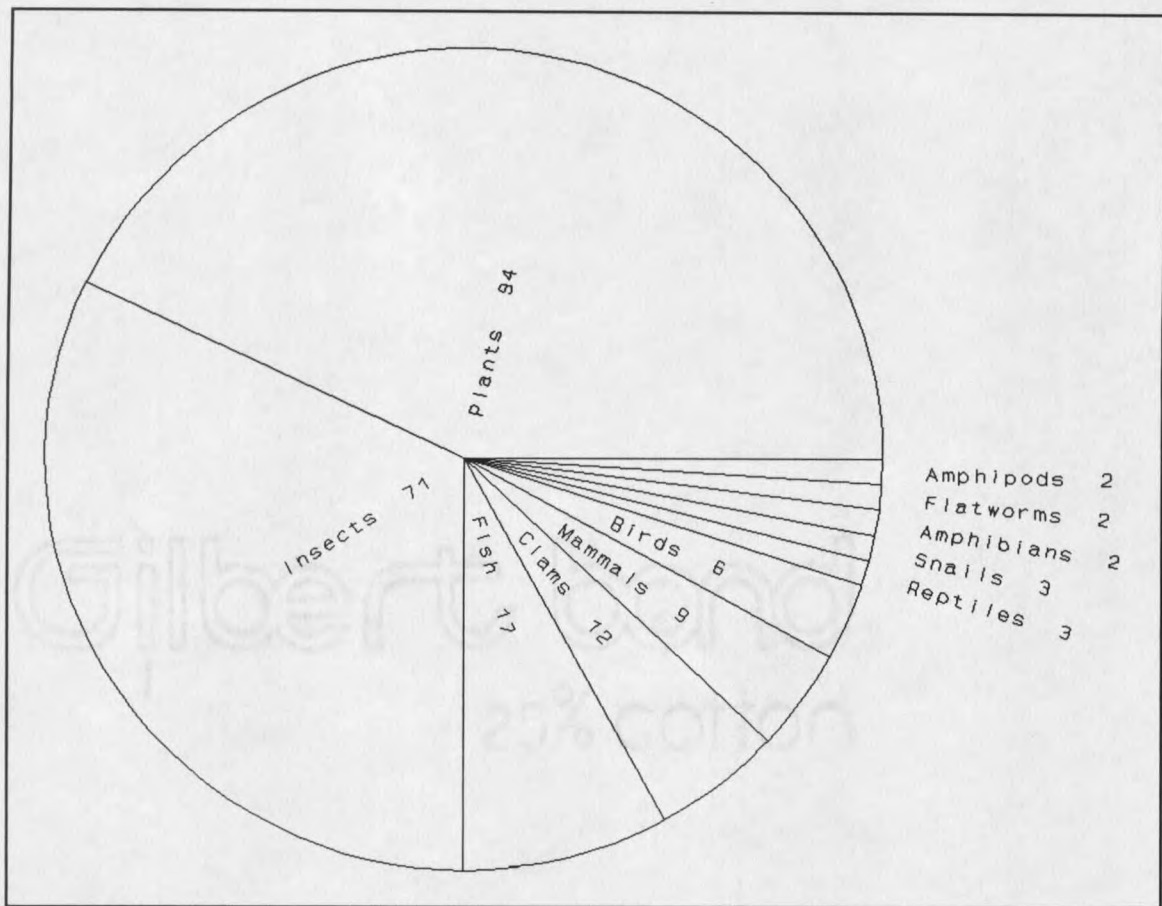


Figure 9. Candidate species now thought to be extinct tallied through 11/21/91 for animals and 2/21/90 for plants.

APPENDIX C
FINAL LISTINGS (SPECIES) CONSIDERED

Appendix C. Final rule listings which were examined for author's dissertation. Species classification as endangered or threatened and the date of publication of the final rule in the Federal Register is also provided.

<u>SPECIES</u>	<u>E/T</u>	<u>DATE OF FINAL RULE</u>
FISH		
Sacramento River Winter-run Chinook Salmon	T	11/30/90
Cahaba Shiner	E	10/25/90
Pallid Sturgeon	E	09/06/90
Neosho Madtom	T	05/22/90
Independence Valley Speckled Dace	E	10/10/89
Clover Valley Speckled Dace	E	10/10/89
Pygmy Sculpin	T	09/28/89
Virgin River Chub	E	08/24/89
Roanoke Logperch	E	08/18/89
Boulder Darter	E	09/01/88
Shortnose Sucker	E	07/18/88
Lost River Sucker	E	07/18/88
Cape Fear Shiner	E	09/25/87
Little Colorado Spinedace	T	09/16/87
Blackside Dace	T	06/12/87
Waccamaw Silverside	T	04/08/87
Pecos Bluntnose Shiner	T	02/20/87
Loach Minnow	T	10/28/86
Spikedace	T	07/01/86
Sonora Chub	T	04/30/86
Desert Pupfish	E	03/31/86
June Sucker	E	03/31/86
Railroad Valley Springfish	T	03/31/86
Desert Dace	T	12/10/85
Warner Sucker	T	09/27/85
White River Springfish	E	09/27/85
Hiko White River Springfish	E	09/27/85
White River Spinedace	E	09/12/85
Amber Darter	E	08/05/85
Conasauga Logperch	E	08/05/85
Owens Tui Chub	E	08/05/85
Niangua Darter	T	06/12/85
Modoc Sucker	E	06/11/85
Big Spring Spinedace	T	03/28/85
Hutton Tui Chub	T	03/28/85
Foskett Speckled Dace	T	03/28/85
Ozark Cavefish	T	11/01/84
Smoky Madtom	E	10/26/84
Yaqui Chub	E	08/31/84
Beautiful Shiner	T	08/31/84
Yaqui Catfish	T	08/31/84
Chihuahua Chub	T	10/11/83

Ash Meadows Speckled Dace	E	09/02/83
Ash Meadows Amargosa Pupfish	E	09/02/83
Borax Lake Chub	E	10/05/82
Leon Springs Pupfish	E	08/15/80
San Marcos Gambusia	E	07/14/80
Goodenough Gambusia	E	04/30/80
Bonytail Chub	E	04/23/80
Totoaba	E	05/21/79
Little Kern Golden Trout	T	05/13/78
Leopard Darter	T	01/27/78
Alabama Cavefish	T	09/09/77
Slender Chub	T	09/09/77
Spotfin Chub	T	09/09/77
Slackwater Darter	T	09/09/77
Yellowfin Madtom	T	09/09/77
Snail Darter	E	10/09/75
Scioto Madtom	E	09/24/75
Bayou Darter	T	09/24/75

MAMMALS

Silver Rice Rat	E	04/30/91
Florida Salt Marsh Vole	E	01/14/91
Indus River Dolphin	E	01/14/91
Steller Sea Lion	T	12/04/90
Sichuan Snub-Nosed Monkey	E	09/27/90
Yunnan Snub-Nosed Monkey	E	09/27/90
Guizhou Snub-Nosed Monkey	E	09/27/90
Lower Keys Rabbit	E	06/21/90
Chinese River Dolphin	E	05/30/89
Anastasia Island Beach Mouse	E	05/12/89
Southeastern Beach Mouse	T	05/12/89
Mexican Long-Nosed Bat	E	09/30/88
Sanborn's Long-Nosed Bat	E	09/30/88
Stephen's Kangaroo Rat	E	09/30/88
Visayan Deer	E	09/01/88
Tipton Kangaroo Rat	E	07/08/88
Hualapai Vole	E	10/01/87
Mount Graham Red Squirrel	E	06/03/87
Giant Kangaroo Rat	E	01/05/87
Dismal Swamp Southeastern Shrew	T	09/26/86
Leadbeater's Possum	E	05/16/86
Buffy Tufted-Ear Marmoset	E	05/16/86
Southern Bearded Saki	E	05/16/86
Large-Eared Hutia	E	05/16/86
Little Earth Hutia	E	05/16/86
Dwarf Hutia	E	05/16/86
Cabrera's Hutia	E	05/16/86
Baluchistan Bear	E	05/16/86
Guadalupe Fur Seal	T	12/16/85
Carolina Northern Flying Squirrel	E	07/01/85

Virginia Northern Flying Squirrel	E	07/01/85
Alabama Beach Mouse	E	06/06/85
Choctawhatchee Beach Mouse	E	06/06/85
Perdido Key Beach Mouse	E	06/06/85
Fresno Kangaroo Rat	E	01/30/85
Cochito	E	01/09/85
Amargosa Vole	E	11/15/84
Key Largo Woodrat	E	08/31/84
Key Largo Cotton Mouse	E	08/31/84
Little Mariana Fruit Bat	E	08/27/84
Mariana Fruit Bat	E	08/27/84
Woodland Caribou (WA, ID, and So. B.C.)	E	02/29/84
Rodrigues Flying Fox Fruit Bat	E	01/23/84
Bulmer's Flying Fox Fruit Bat	E	01/23/84
Singapore Roundleaf Horseshoe Bat	E	01/23/84
Bumblebee Bat	E	01/23/84
Buff-Headed Marmoset	E	01/23/84
Preuss's Red Colobus Monkey	E	01/23/84
Vancouver Island Marmoset	E	01/23/84
African Wild Dog	E	01/23/84
Pakistan Sand Cat	E	01/23/84
Giant Panda	E	01/23/84
Ocelot-US Pop	E	07/21/82
Black Rhinoceros	E	07/14/80
Virginia Big-Eared Bat	E	11/30/79
Ozark Big-Eared Bat	E	11/30/79
Grevy's Zebra	T	08/21/79
Hartmann's Mountain Zebra	T	08/21/79
West African Manatee	T	07/20/79
Ryukyu Rabbit	E	06/25/79
Simien Fox	E	06/25/79
Malabar Large Spotted Civet	E	06/25/79
Iriomote Cat	E	06/25/79
Fea's Muntjac	E	06/25/79
Formosan Sika	E	06/25/79
Ryukyu Sika	E	06/25/79
North China Sika	E	06/25/79
Shansi Sika	E	06/25/79
South China Sika	E	06/25/79
Corsican Red Deer	E	06/25/79
Barbary Deer	E	06/25/79
Yarkand Deer	E	06/25/79
Bactrian Deer	E	06/25/79
Western Giant Eland	E	06/25/79
Jentink's Duiker	E	06/25/79
Tora Hartebeest	E	06/25/79
Swayne's Hartebeest	E	06/25/79
Zanzibar Suni	E	06/25/79
Sand Gazelle	E	06/25/79
Saudi Arabian Gazelle	E	06/25/79
Pelzeln's Gazelle	E	06/25/79
Arabian Gazelle	E	06/25/79

Arabian Tahr	E	06/25/79
Caribbean Monk Seal	E	04/10/79
African Elephant	T	05/12/78
Gray Wolf-Mexico and US except MN	E	03/09/78
Southern Sea Otter	T	01/14/77
Hawaiian Monk Seal (FR-NMFS)	E	09/22/76
Cotton-Top Marmoset	E	10/19/76
Pied Tamarin	E	10/19/76
Yellow-Tailed Woolly Monkey	E	10/19/76
Diana Monkey	E	10/19/76
Red-Eared Nose-Spotted Monkey	E	10/19/76
Red-Bellied Monkey	E	10/19/76
L'hoest's Monkey	E	10/19/76
White-Collared Mangabey	E	10/19/76
Black Colobus	E	10/19/76
Mandrill	E	10/19/76
Drill	E	10/19/76
Francois Leaf Monkey	E	10/19/76
Lesser Slow Loris	T	10/19/76
Philippine Tarsier	T	10/19/76
White-Footed Tamarin	T	10/19/76
Black Howler Monkey	T	10/19/76
Stumptail Macaque	T	10/19/76
Gelada Baboon	T	10/19/76
Formosan Rock Macaque	T	10/19/76
Japanese Macaque	T	10/19/76
Toque Macaque	T	10/19/76
Long-Tailed Langur	T	10/19/76
Purple-Faced Langur	T	10/19/76
Tonkin Snub-Nosed Monkey	T	10/19/76
Pygmy Chimpanzee-Zaire	T	10/19/76
Chimpanzee-Western and Central Africa	T	10/19/76
Gray Bat	E	04/28/76
Mexican Wolf	E	04/28/76
Cedros Island Mule Deer	E	09/24/75
Peninsular Pronghorn Antelope	E	09/24/75
Grizzly Bear-48 Conterminous States	T	07/28/75

BIRDS

White-Necked Crow	E	04/03/91
Golden-Cheeked Warbler	E	12/27/90
Northern Bald Ibis	E	09/28/90
White-Winged Guan	E	09/28/90
Cheer Pheasant	E	09/28/90
Red-Tailed Parrot	E	09/28/90
Norfolk Island Parakeet	E	09/28/90
Madagascar Red Owl	E	09/28/90
Northern Spotted Owl	T	06/26/90
Roseate Tern-Northeastern Pop	E	11/02/87
Roseate Tern-Caribbean Pop	T	11/02/87

Black-Capped Vireo	E	10/06/87
Inyo Brown Towhee	T	08/03/87
Audubon's Crested Caracara-Fla. Pop	T	07/06/87
Florida Scrub Jay	T	06/03/87
Florida Grasshopper Sparrow	E	07/31/86
Least Bell's Vireo	E	05/02/86
Northern Aplomado Falcon	E	02/25/86
Piping Plover (Great Lakes Watershed)	E	12/11/85
Piping Plover (All Pops except above)	T	12/11/85
Least Tern-Interior Pop	E	05/28/85
Guam Broadbill	E	08/27/84
Mariana Crow	E	08/27/84
Mariana Gallinule	E	08/27/84
Micronesian Kingfisher	E	08/27/84
Guam Rail	E	08/27/84
Vanikoro Swiftlet	E	08/27/84
Bridled White-Eye	E	08/27/84
Wood Stork-US Breeding Pop	E	02/28/84
Red-Necked Amazon Parrot	E	06/25/79
Bald Eagle (all populations in the 48 conterminous states except those below)	E	02/14/78
Bald Eagle (WA, OR, MN, MI, WI populations)	T	02/14/78
San Clemente Loggerhead Shrike	E	08/11/77
San Clemente Sage Sparrow	T	08/11/77
Marianas Mallard	E	06/02/77
Yellow-Shouldered Blackbird	E	11/19/76
Hawaii Creeper	E	09/24/75
Po'o Uli	E	09/24/75
Newell's Manx Shearwater	T	09/24/75

REPTILES

Yellow-Blotched Map Turtle	T	01/14/91
Desert Tortoise (Mojave Population)	T	04/02/90
Sand Skink	T	11/06/87
Blue-Tailed Mole Skink	T	11/06/87
Gopher Tortoise	T	07/07/87
Alabama Red-Bellied Turtle	E	06/16/87
Flattened Musk Turtle	T	06/11/87
Ringed Sawback Turtle	T	12/23/86
Concho Water Snake	T	09/03/86
Hierro Giant Lizard	E	02/29/84
Ibiza Wall Lizard	T	02/29/84
Serpent Island Gecko	T	06/22/83
Acklins Ground Iguana	T	06/22/83
Allen's Cay Iguana	T	06/22/83
Andros Island Ground Iguana	T	06/22/83
Cayman Brac Ground Iguana	T	06/22/83
Cuban Ground Iguana	T	06/22/83
Exuma Island Iguana	T	06/22/83
Grand Cayman Ground Iguana	E	06/22/83

Jamaican Iguana	E	06/22/83
Mayaguana Iguana	T	06/22/83
Turks and Caicos Ground Iguana	T	06/22/83
Watling Island Ground Iguana	E	06/22/83
White Cay Ground Iguana	T	06/22/83
Round Island Skink	T	06/22/83
Central American River Turtle	E	06/22/83
Aruba Island Rattlesnake	T	06/22/83
Lar Valley Viper	E	06/22/83
Monito Gecko	E	10/15/82
Coachella Valley Fringe-Toed Lizard	T	09/25/80
Desert Tortoise (Beaver Dam Slope Utah population)	T	08/20/80
Plymouth Red-Bellied Turtle Massachusetts	E	04/02/80
Fiji Island Banded Iguana	E	03/20/80
Fiji Crested Iguana	E	03/20/80
San Esteban Island Chuckwalla	E	03/20/80
Round Island Boas (<i>Bolyeria multocarinata</i>)	E	03/20/80
Round Island Boas (<i>Casarea dussumieri</i>)	E	03/20/80
American Crocodile	E	12/18/79
Saltwater Crocodile (exclusive of Papua, New Guinea population)	E	12/18/79
Bolson Tortoise	E	04/17/79
New Mexican Ridge-Nosed Rattlesnake	T	08/04/78
Loggerhead Sea Turtles	T	07/28/78
Green Sea Turtle	T	07/28/78
Green Sea Turtle (breeding colony populations in Florida and on the Pacific coast in Mexico)	E	07/28/78
Olive (Pacific) Ridley Sea Turtle	T	07/28/78
Olive (Pacific) Ridley Sea Turtle (breeding colony populations in Pacific coast of Mexico)	E	07/28/78
Mona Boa	T	02/03/78
Mona Ground Iguana	T	02/03/78
Eastern Indigo Snake	T	01/31/78
Atlantic Salt Marsh Snakes	T	11/29/77
San Clemente Island Night Lizard	T	08/11/77
Giant Anole	E	07/21/77
St. Croix Ground Lizard	E	06/03/77
American Crocodile	E	09/24/75

APPENDIX D

HISTOGRAMS COMPARING THE DISTRIBUTION OF ENDANGERED SPECIES
WITH THE DISTRIBUTION OF THREATENED SPECIES
FOR DISCRETE VARIABLES

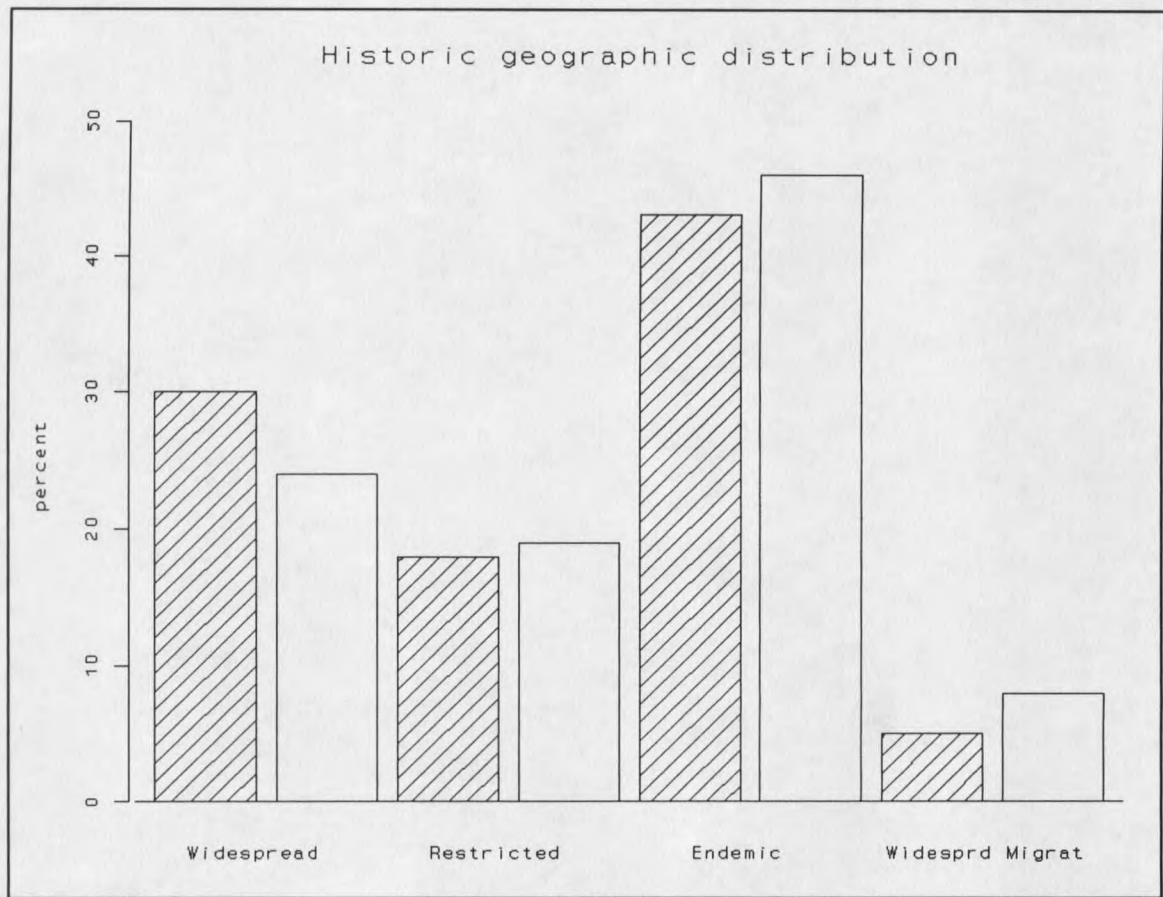


Figure 10. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable historic geographic distribution. Widesprd migrat=widespread breeding range, migratory. Missing values for endangered and threatened species are 4% and 3% respectively.

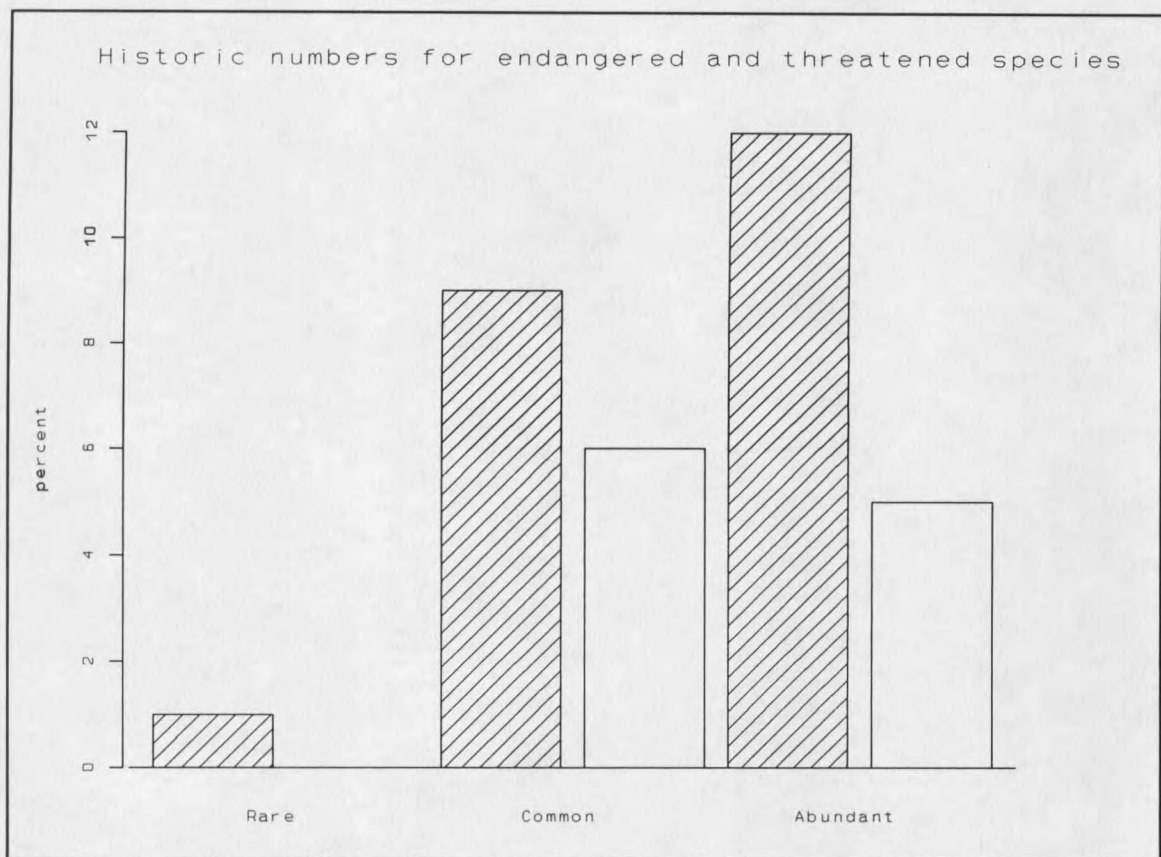


Figure 11. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable historic numbers. Missing values for endangered and threatened species are 77% and 88% respectively.

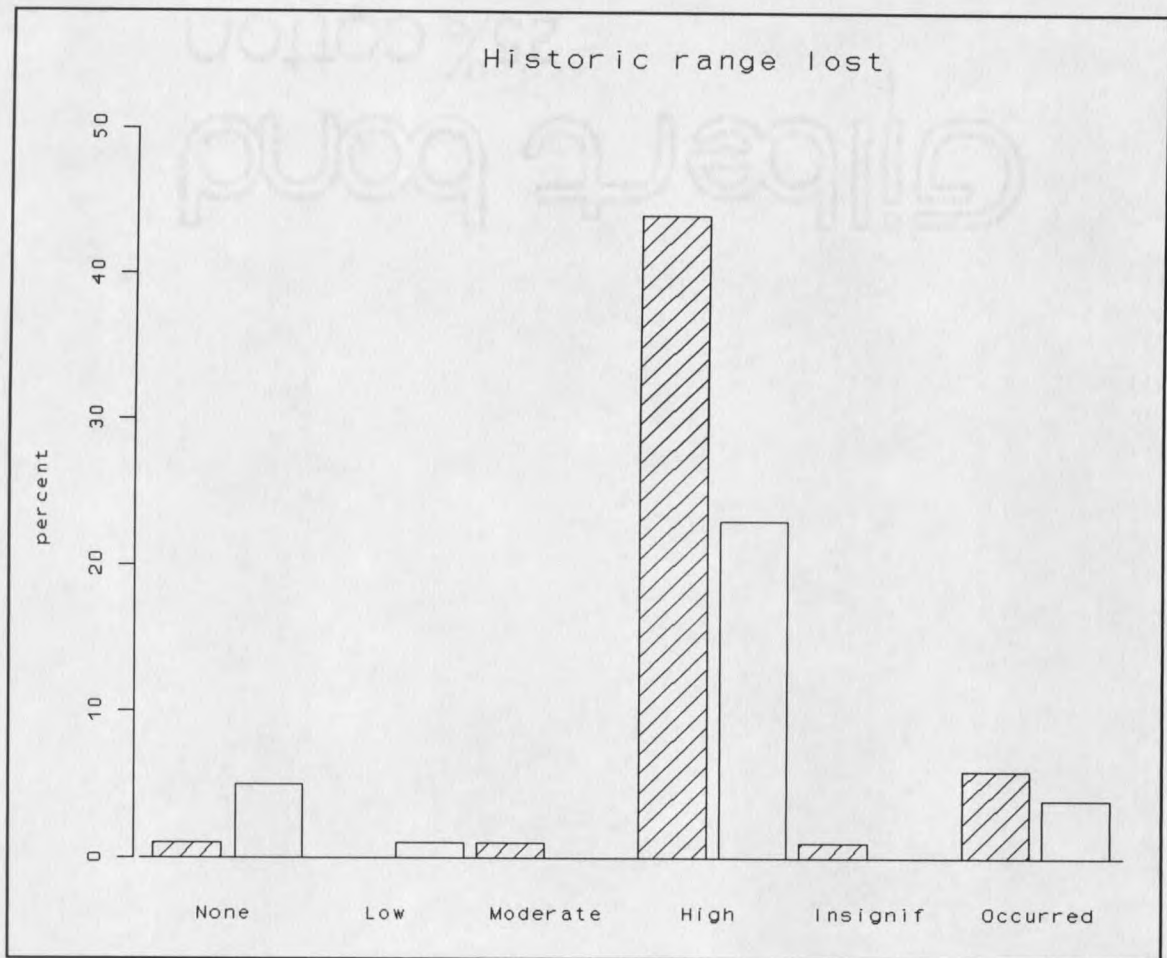


Figure 12. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable historic range lost. Missing values for endangered and threatened species are 47% and 67% respectively.

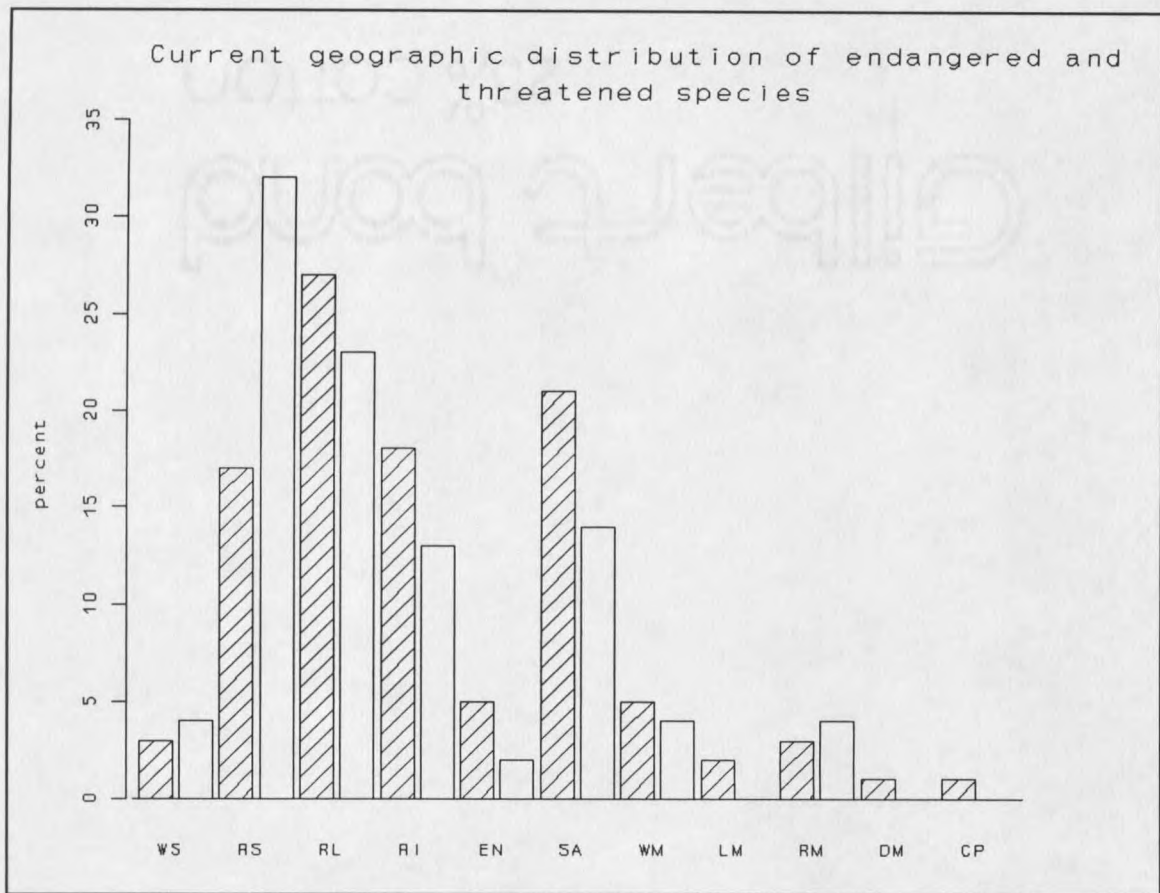


Figure 13. Comparison of the distribution of endangered species (////), with the distribution of threatened species (blank) for the variable current geographic distribution. WS=widespread, RS=restricted, RL=relict, RI=relict & isolated, EN=endemic, SA=single area, WM=widespread & migratory, LM=limited (restricted) & migratory, RM=relict & migratory, DM=disjunct (relict) & migratory, CP=captive populations only. Missing values for endangered and threatened species are 2% and 3% respectively.

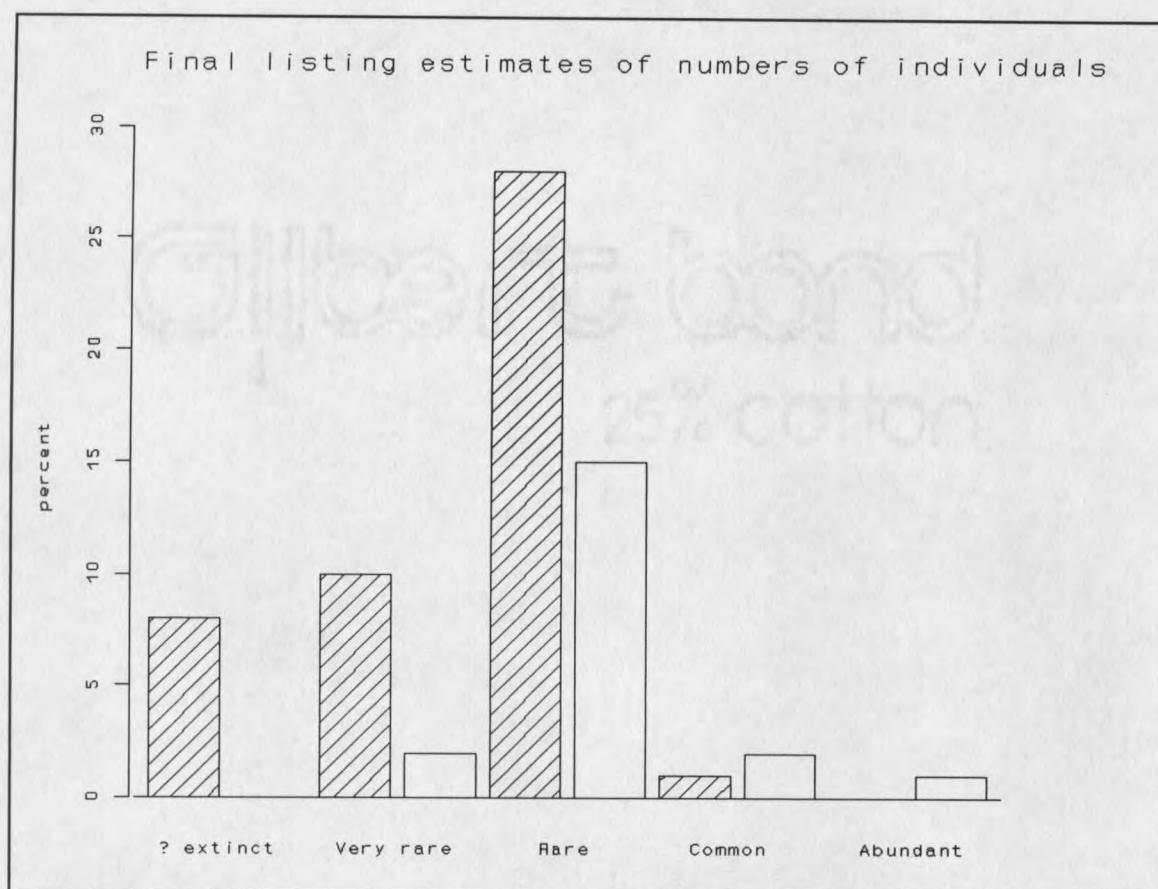


Figure 14. Comparison of the distribution of endangered species (////) with the distribution of threatened species for the discrete variable *numbers of e/t individuals remaining*. Missing values for endangered species and threatened species are 53% and 80% respectively. Y-axis is the percent of final listings which were found in each discrete category.

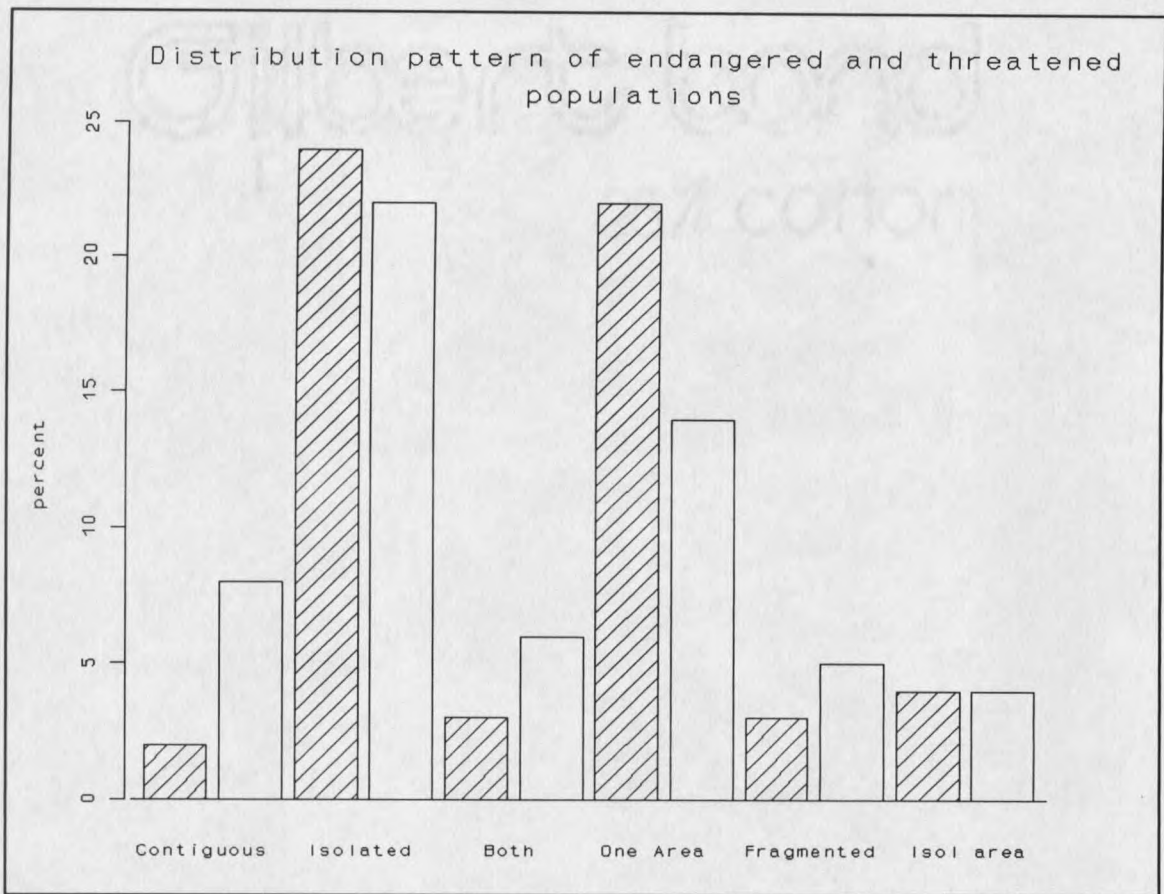


Figure 15. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable distribution patterns of populations. One area = one area with no mention of proximity of conspecifics, fragmented=small & fragmented (no mention of isolation), isol area=1 area isolated from conspecifics. Missing values for endangered and threatened species are 42% and 41% respectively.

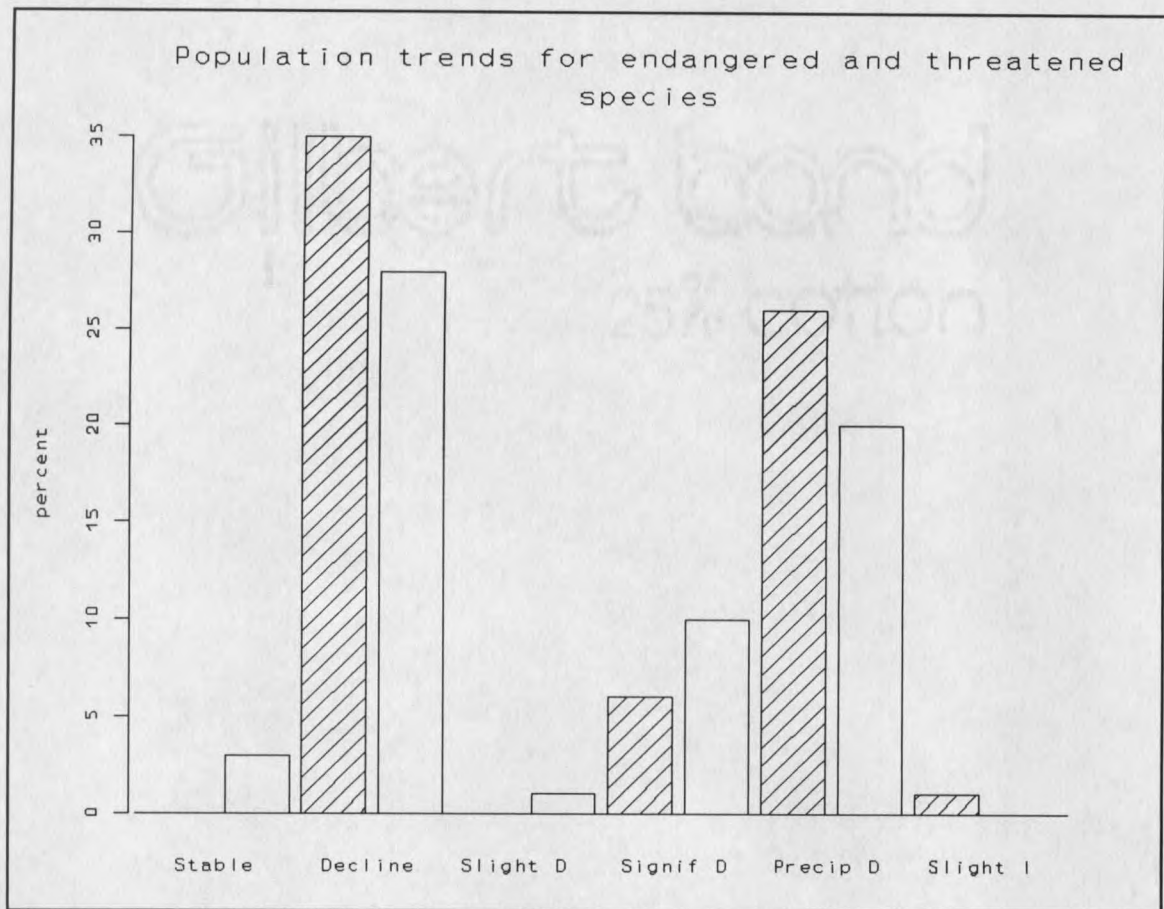


Figure 16. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable population trends. D=decline, I=increase. Missing values for endangered and threatened species are 31% and 38% respectively.

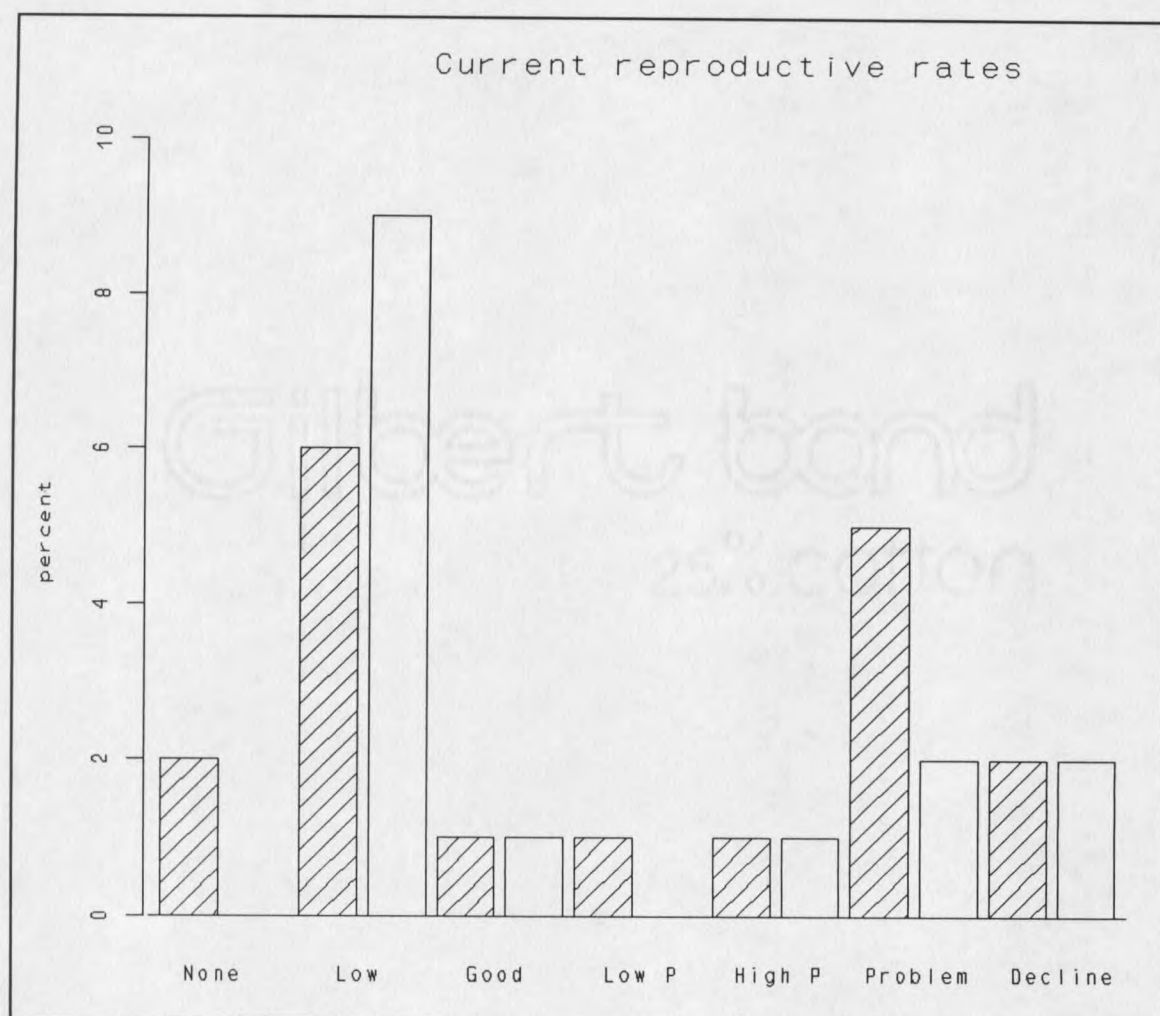


Figure 17. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable reproductive rate. P = potential. Missing values for endangered and threatened species are 84% and 85% respectively.

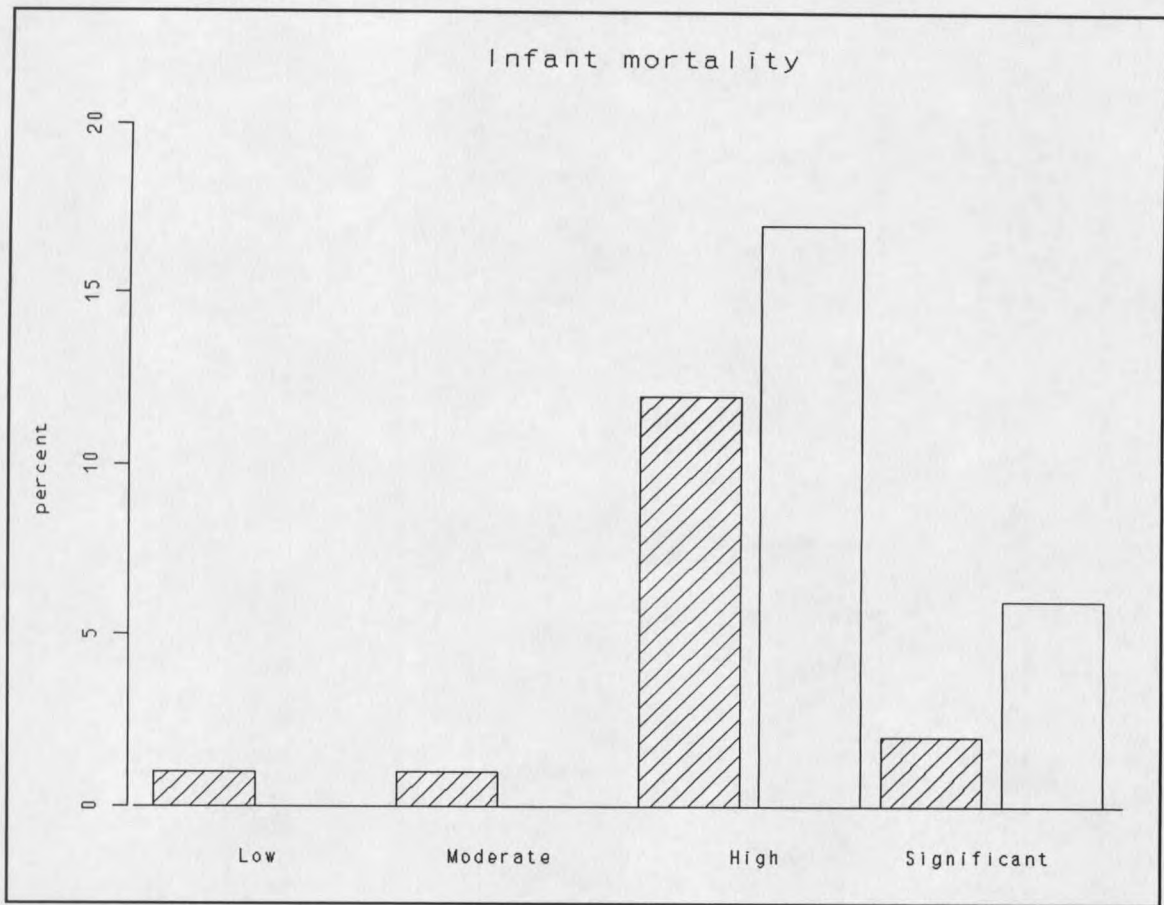


Figure 18. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable infant mortality. Missing values for endangered and threatened species are 85% and 76% respectively.

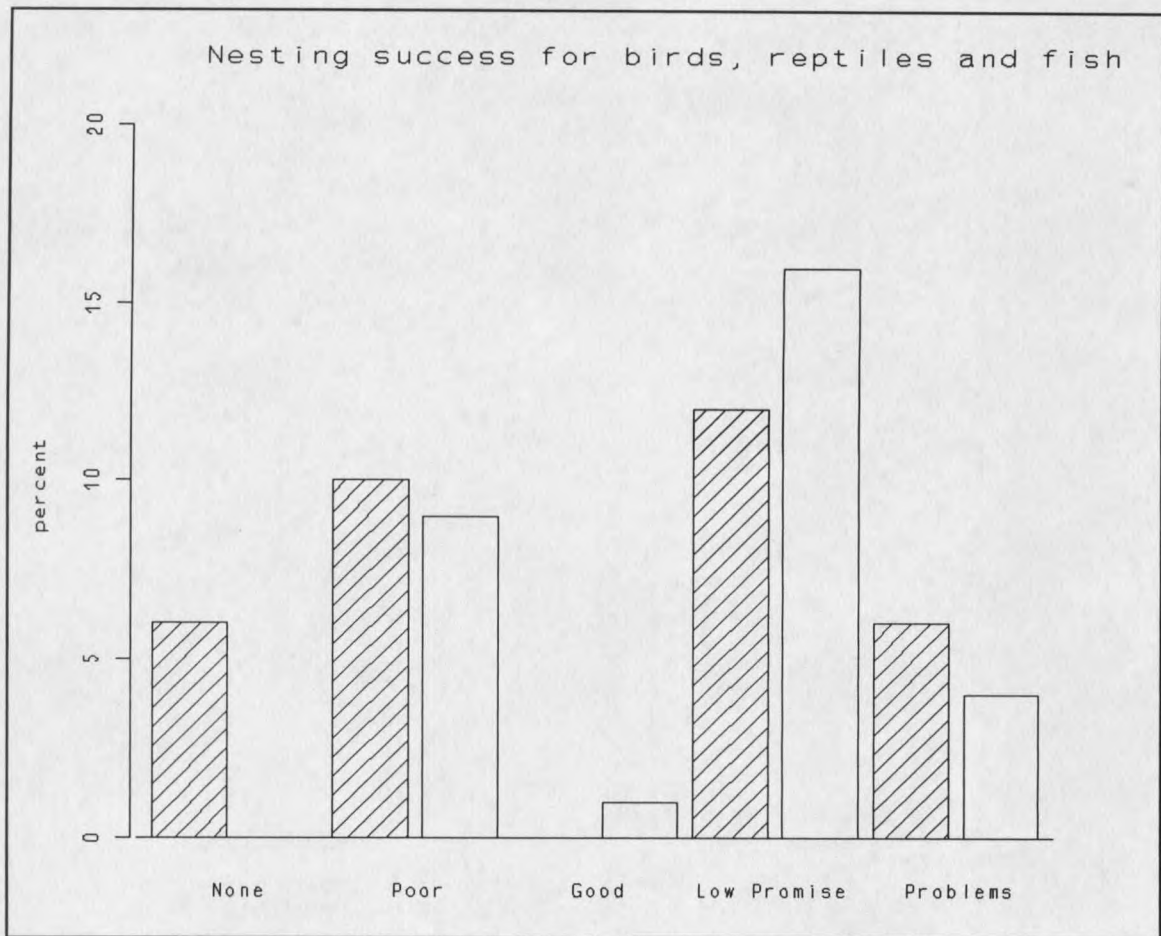


Figure 19. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable nesting success. Low promise=potential for future nesting success is low, Problems=potential for future problems exists. Missing values for endangered and threatened species are 66% and 70% respectively.

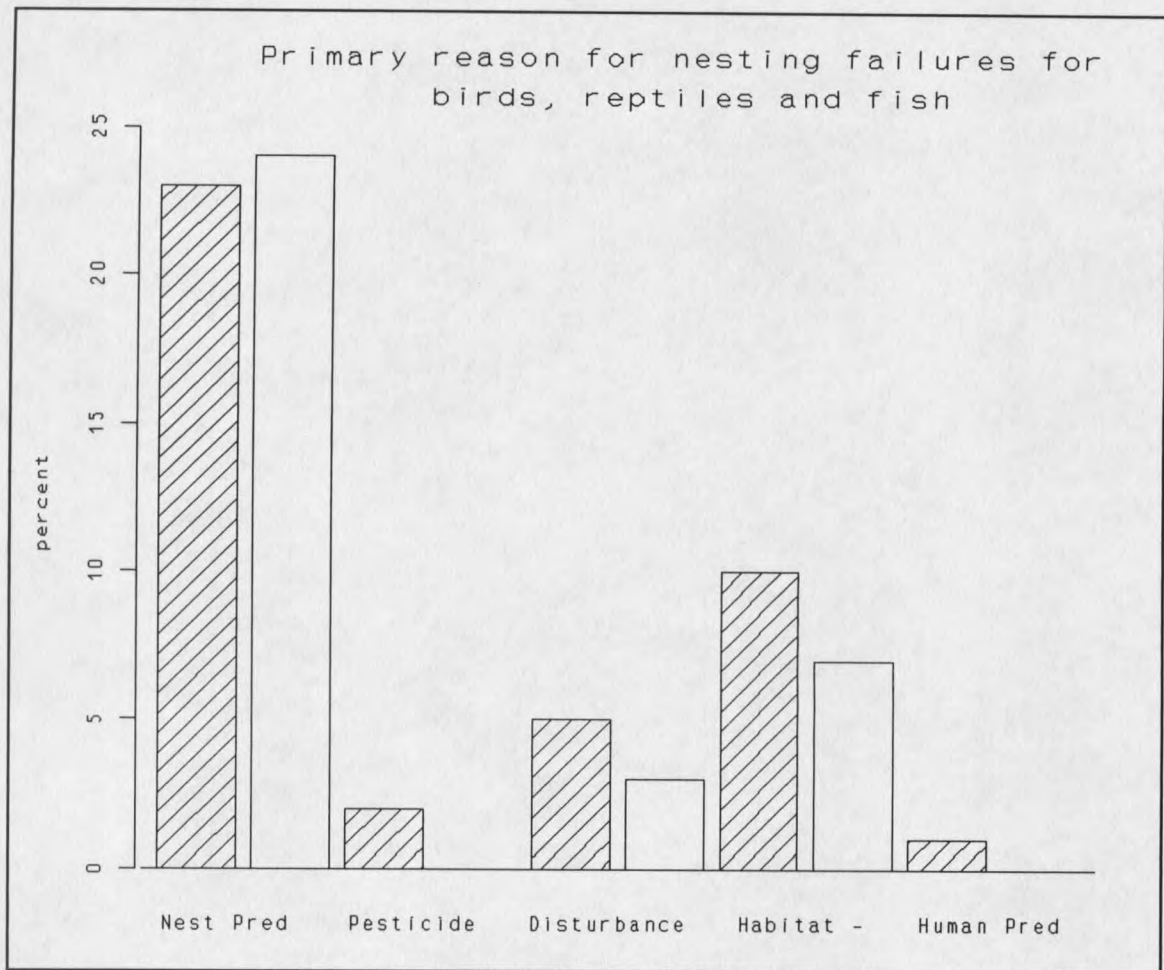


Figure 20. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable primary reason for nesting failure. Nest pred=nest predation by exotic and/or native species, Disturbance= Human disturbance (trampling of nests, separation of young from adults etc.), Habitat - = Loss of nesting/spawning habitat, Human pred=Human predation of nests (eggs and/or young). Missing values for endangered and threatened species are 59% and 66% respectively.

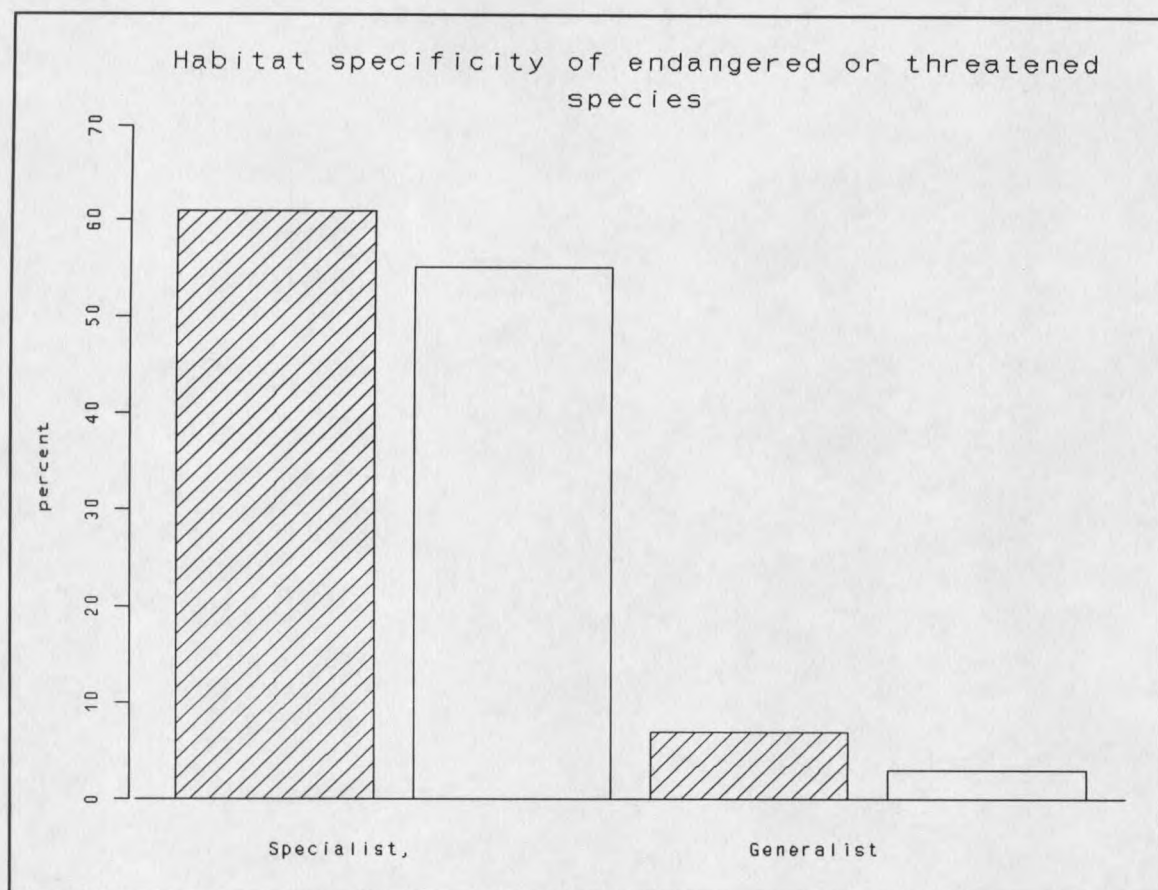


Figure 21. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable habitat specificity. Missing values for endangered and threatened species are 31% and 42% respectively.

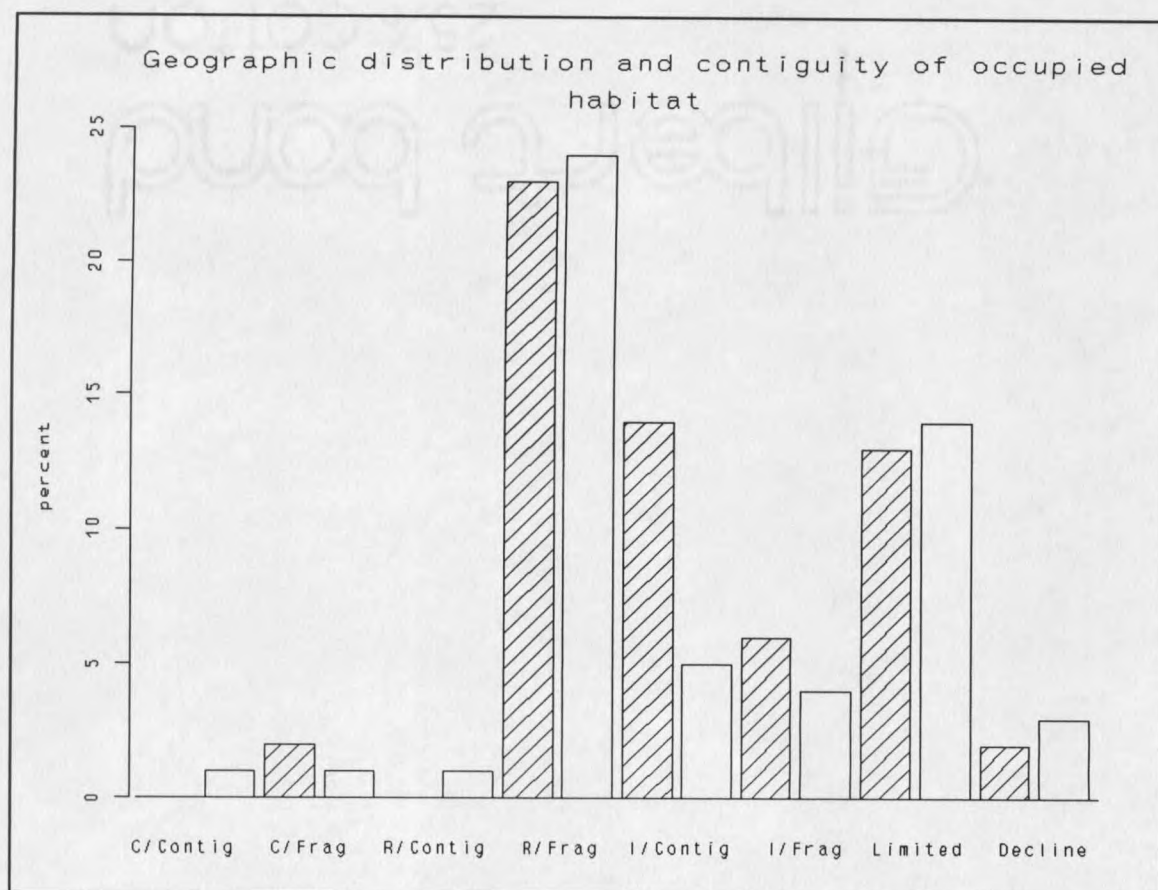


Figure 22. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable status of occupied habitat. C=common, R=rare and I=island. Missing values for endangered and threatened species are 41% and 46% respectively.

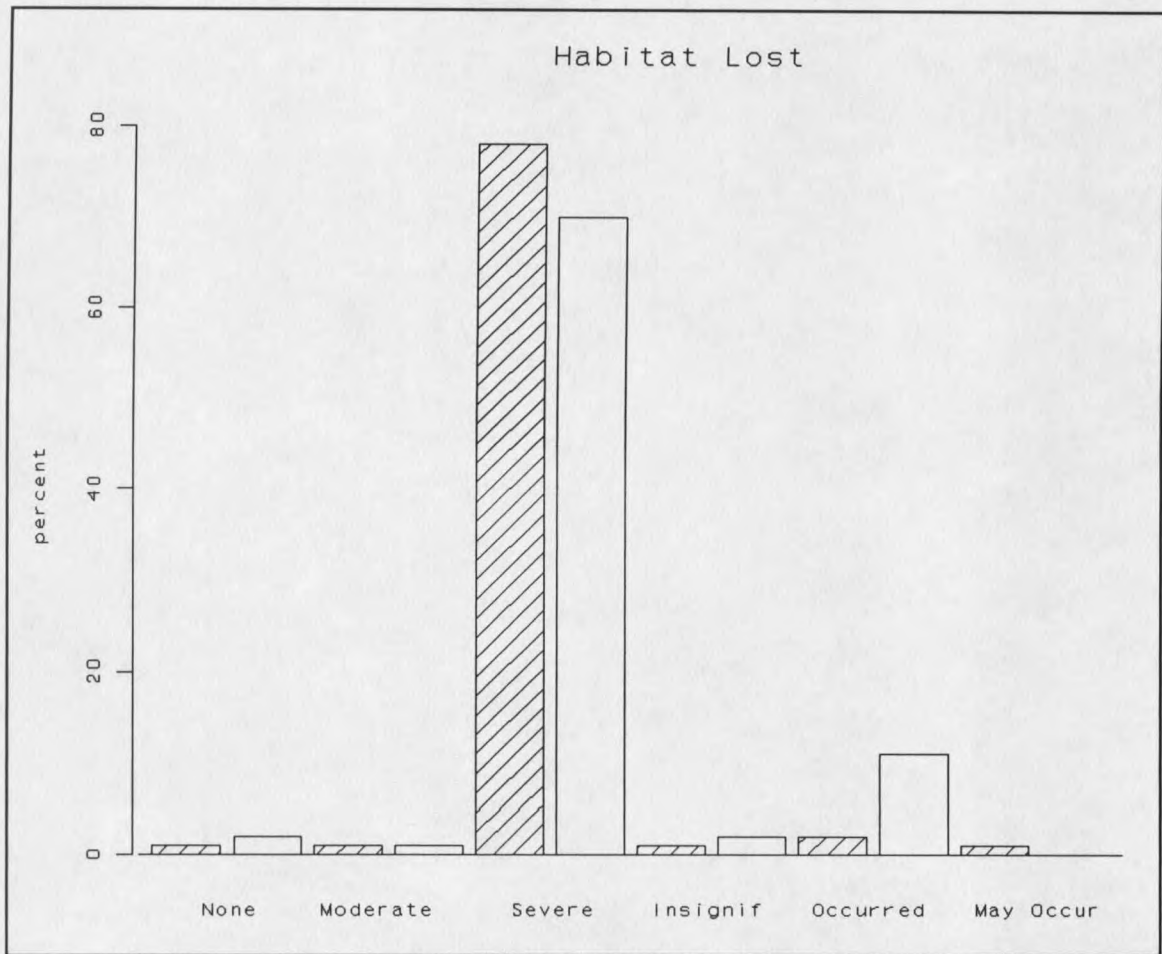


Figure 23. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable habitat loss. Missing values for endangered and threatened species are 16% and 14% respectively.

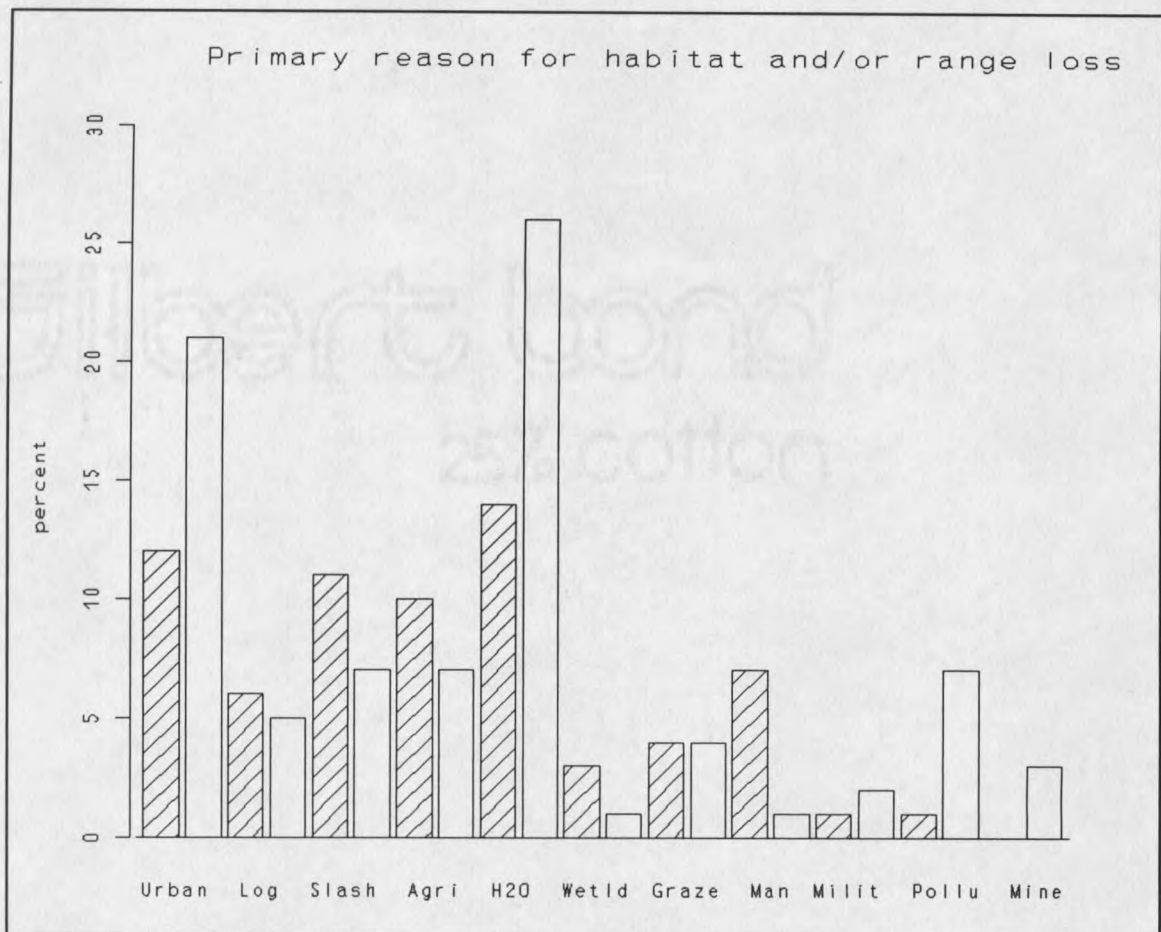


Figure 24. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable primary reason for habitat and/or range loss. Urban=urbanization and development, Log=logging, Slash=slash & burn agriculture, Agri=agricultural development (other than slash & burn), H2O=hydroelectric dams and water diversion projects, Wetld=filling or draining of wetlands, Graze=livestock grazing, Man=human disturbance, Milit=military activity, Pollu=pollution and/or siltation, Mine=mining activities. Missing values for endangered and threatened species are 32% and 13% respectively.

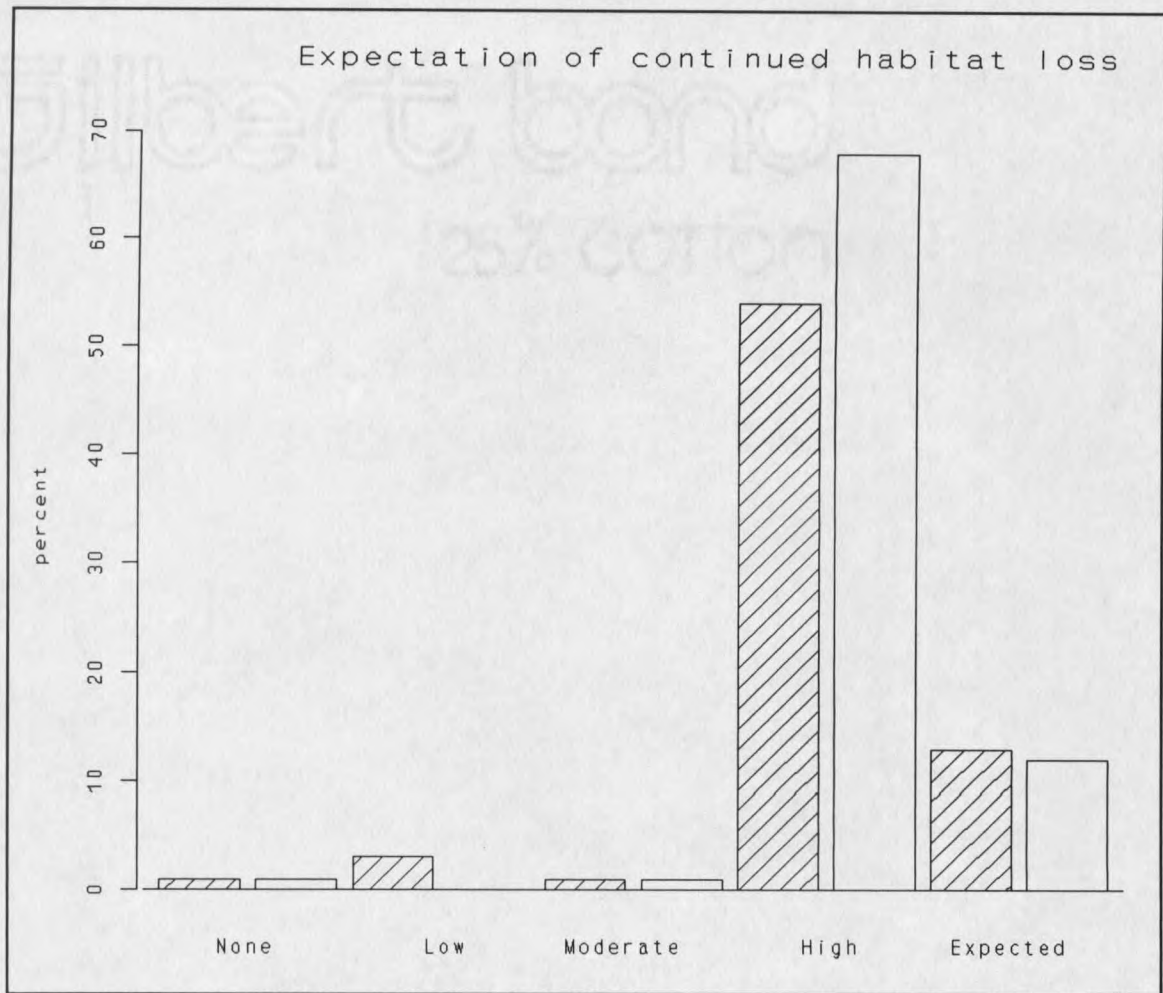


Figure 25. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable expectation of continued habitat loss. Missing values for endangered and threatened species are 29% and 18% respectively.

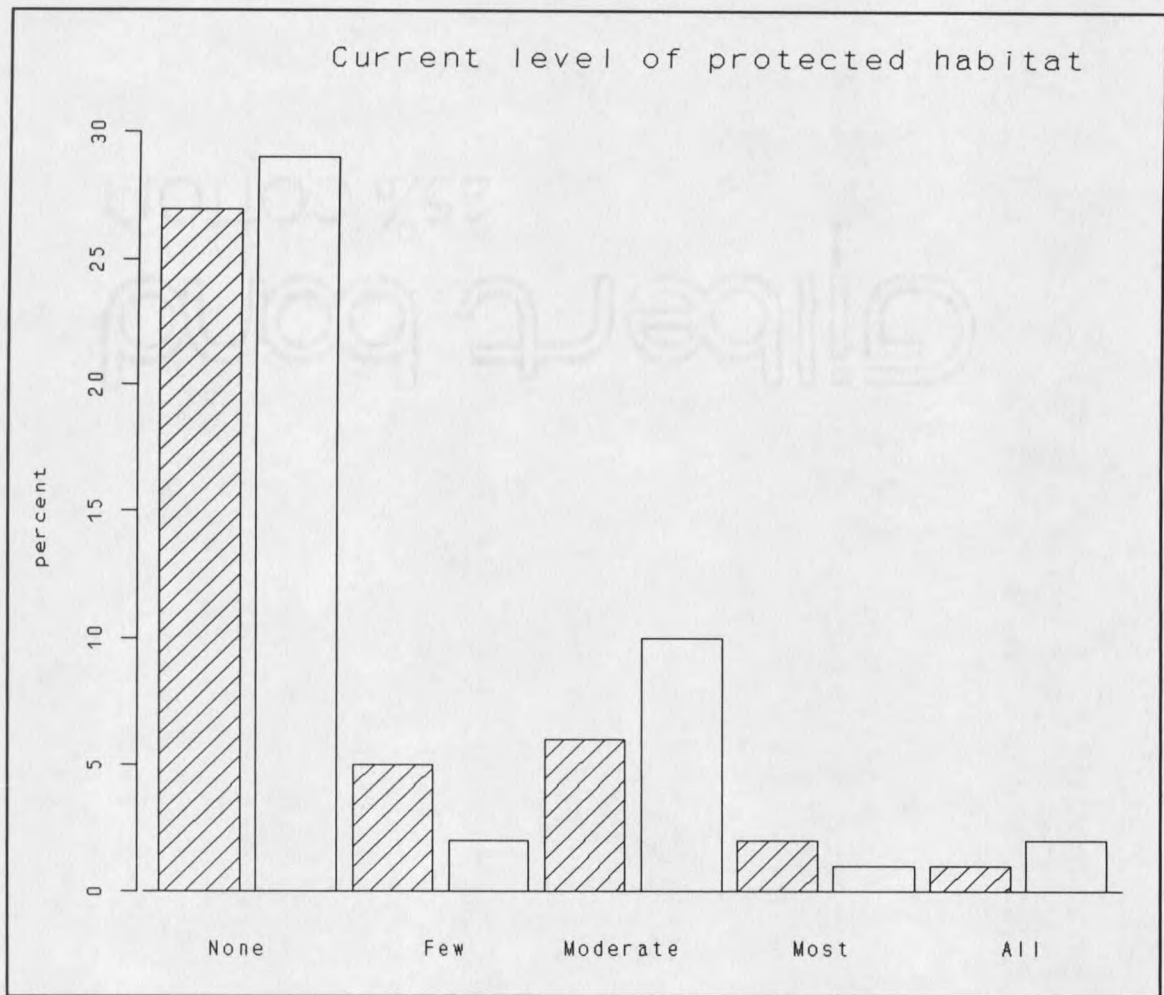


Figure 26. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable current level of protected areas of habitat. Missing values for endangered and threatened species are 59% and 56% respectively.

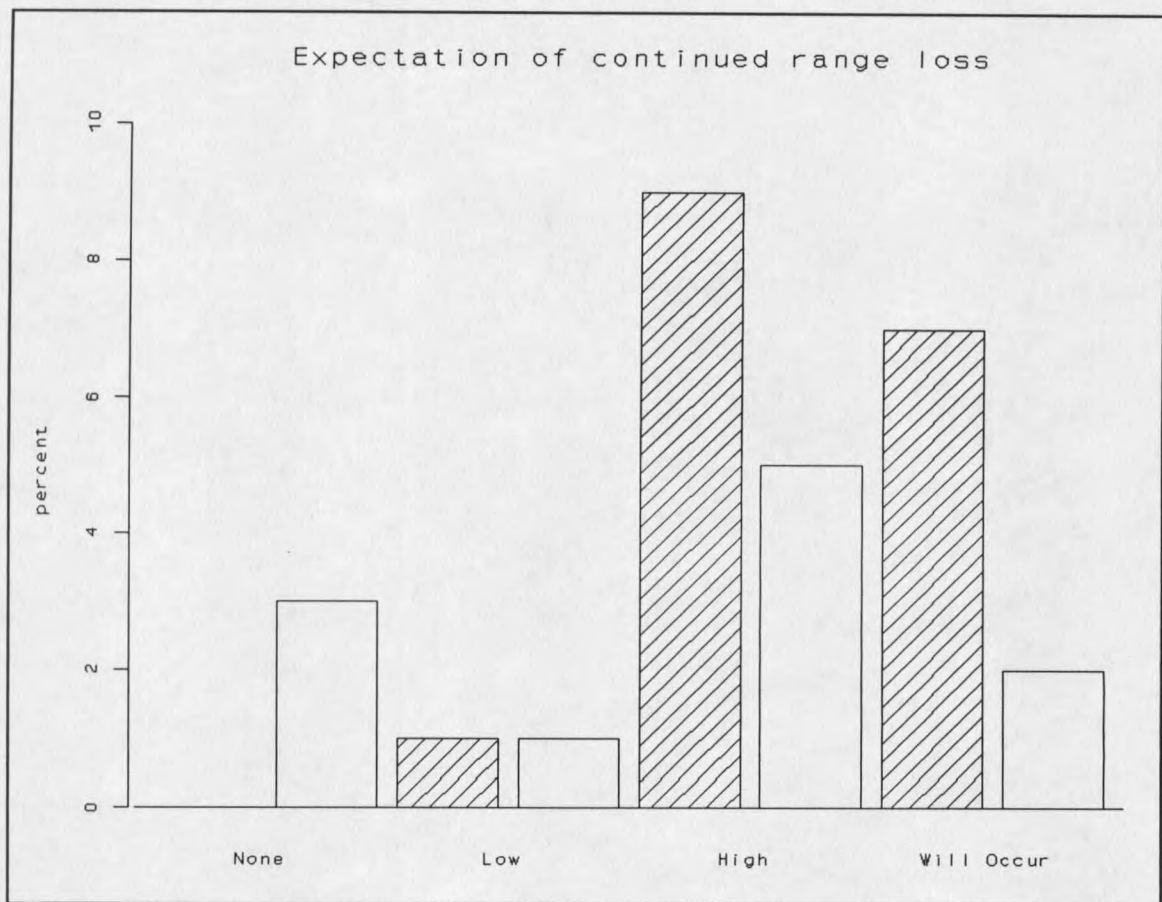


Figure 27. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable expectation of continued range loss. Missing values for endangered and threatened species are 83% and 88% respectively.

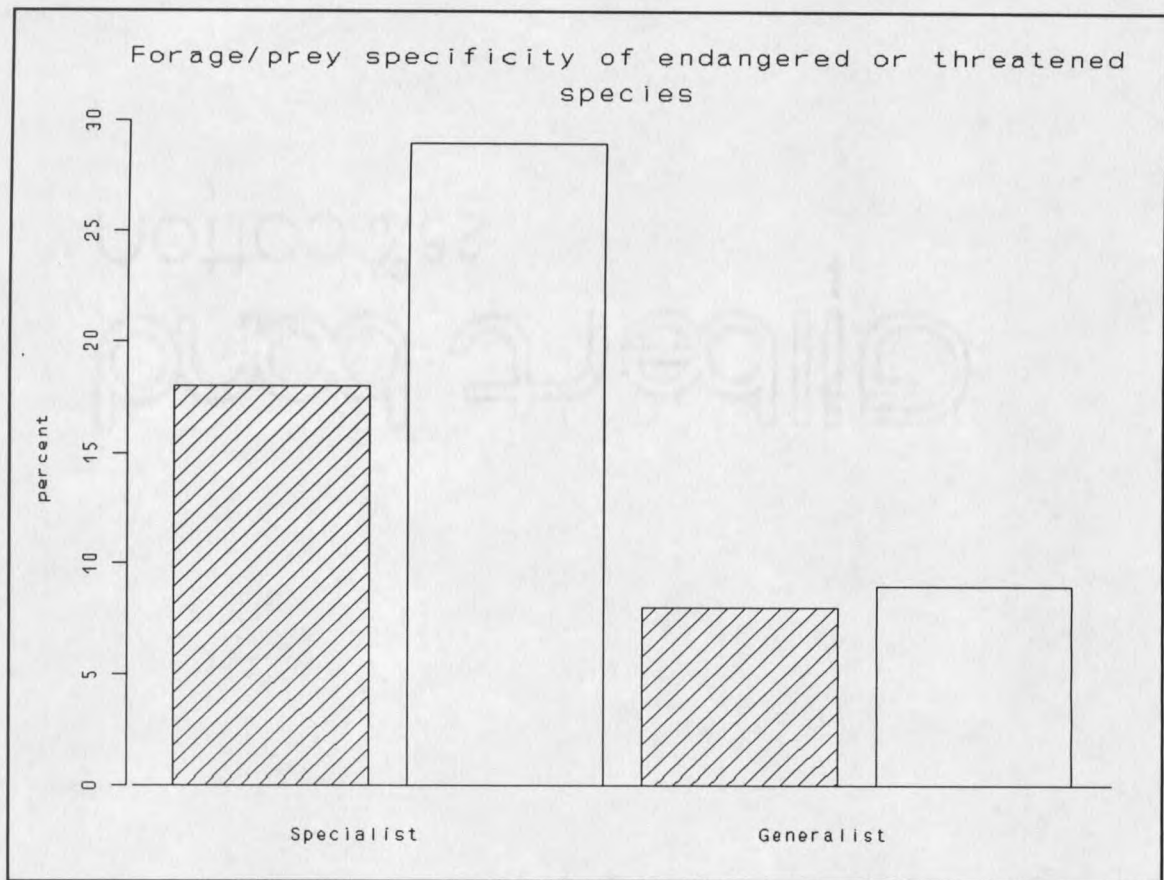


Figure 28. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable forage/prey specificity. Missing values for endangered and threatened species are 74% and 62% respectively.

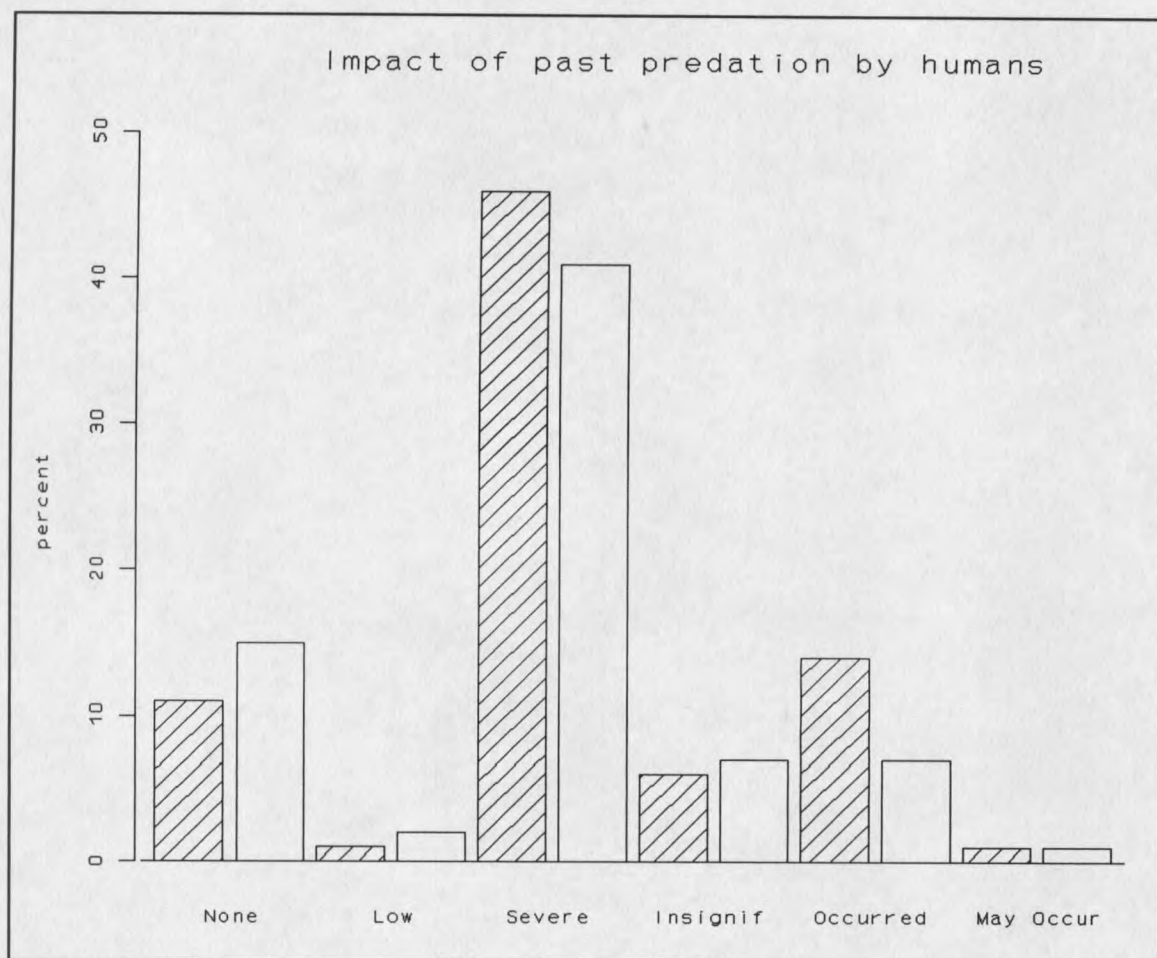


Figure 29. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable impact of past predation by humans. Missing values for endangered and threatened species are 21% and 26% respectively.

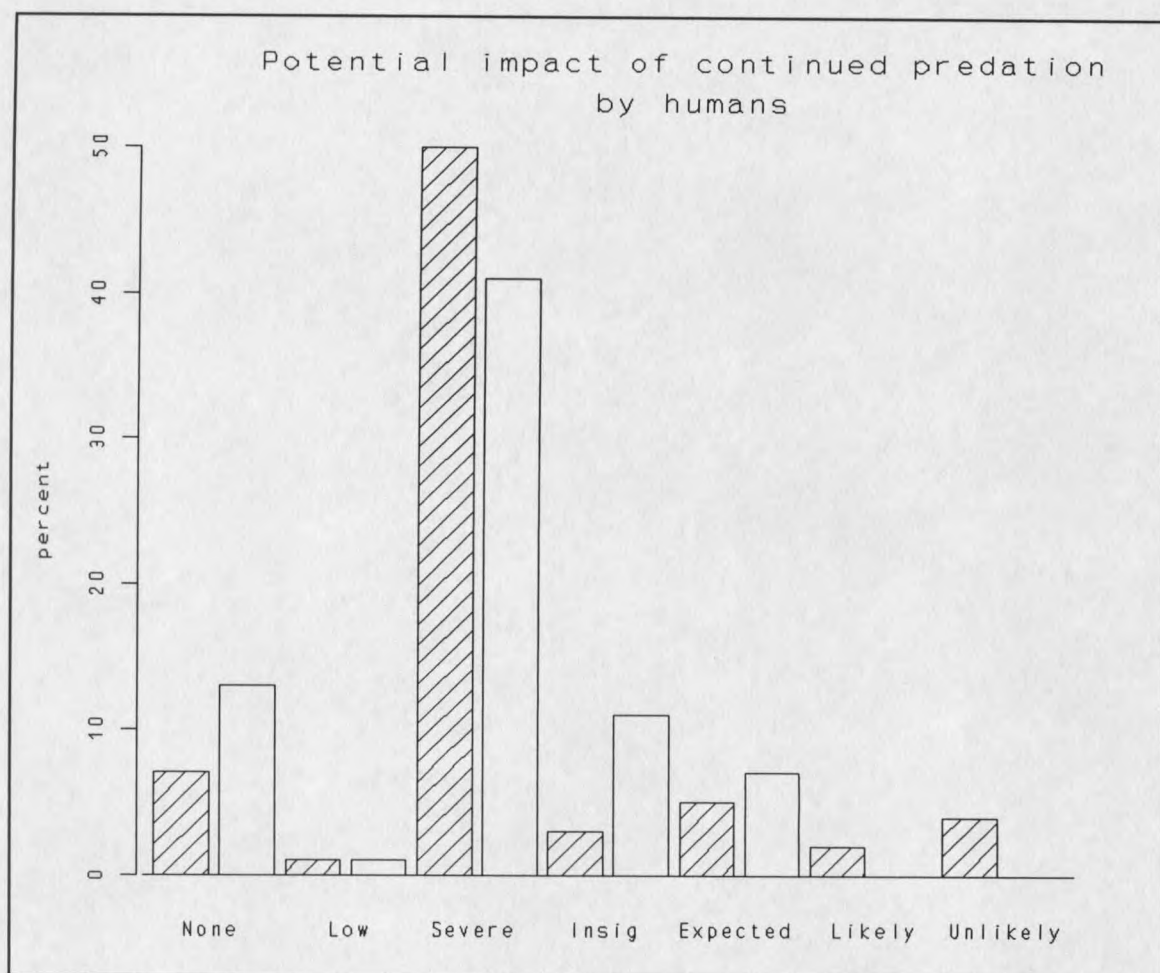


Figure 30. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable potential impact of continued predation by humans. Missing values for endangered and threatened species are both 27%.

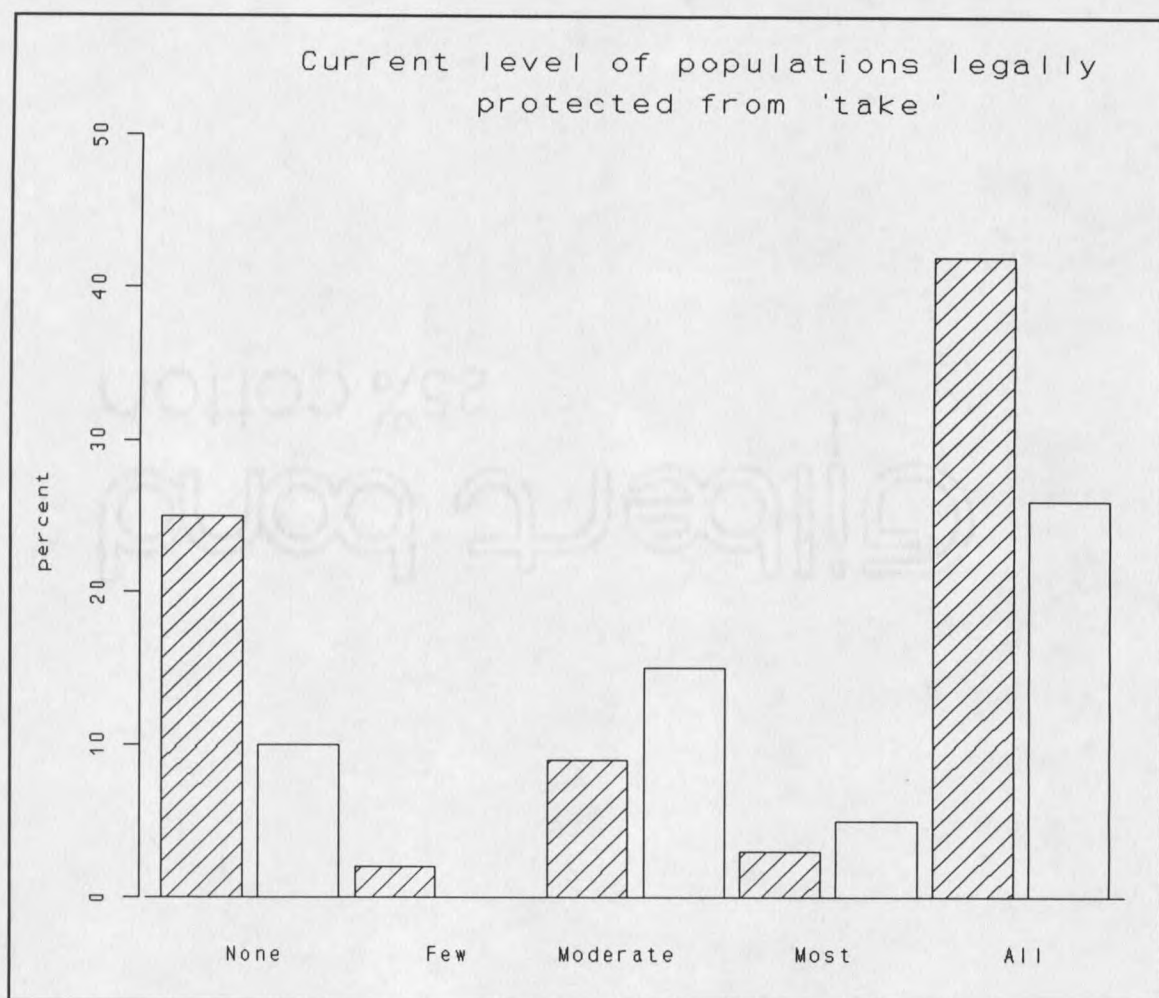


Figure 31. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable current level of legal protection from "take" at the time of listing. Missing values for endangered and threatened species is 19% for both.

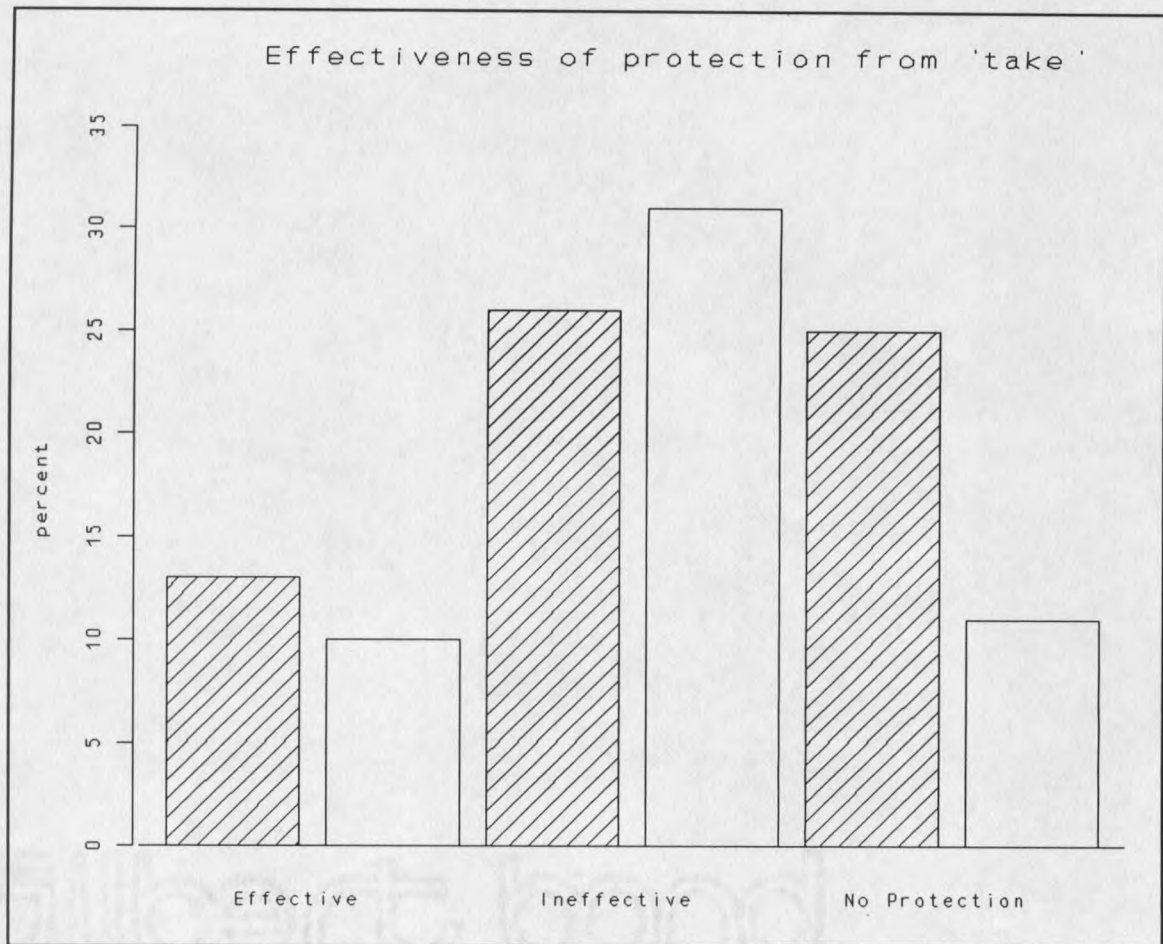


Figure 32. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable effectiveness of protection from "take" at the time of listing. Missing values for endangered and threatened species are 36% and 48% respectively.

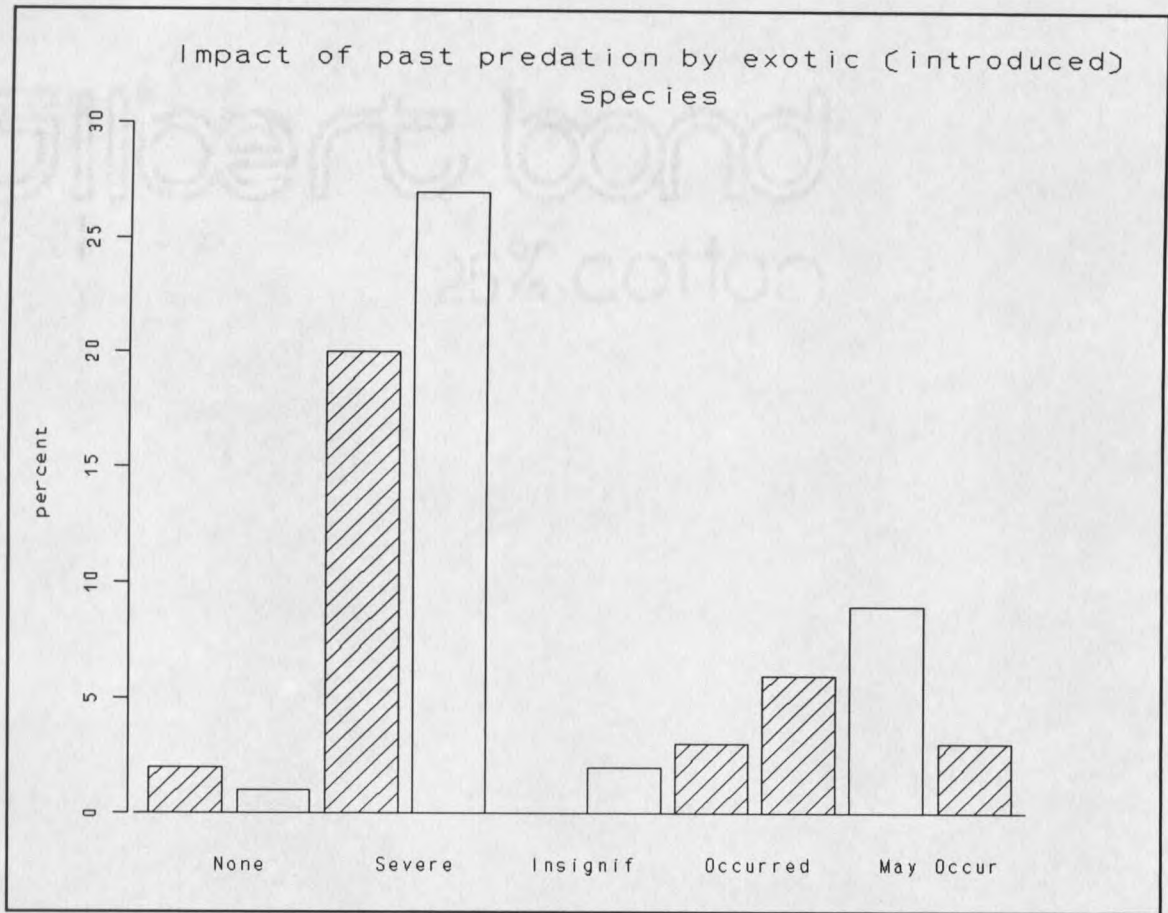


Figure 33. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable past impact of predation by exotic species. Missing values for endangered and threatened species are 66% and 60% respectively.

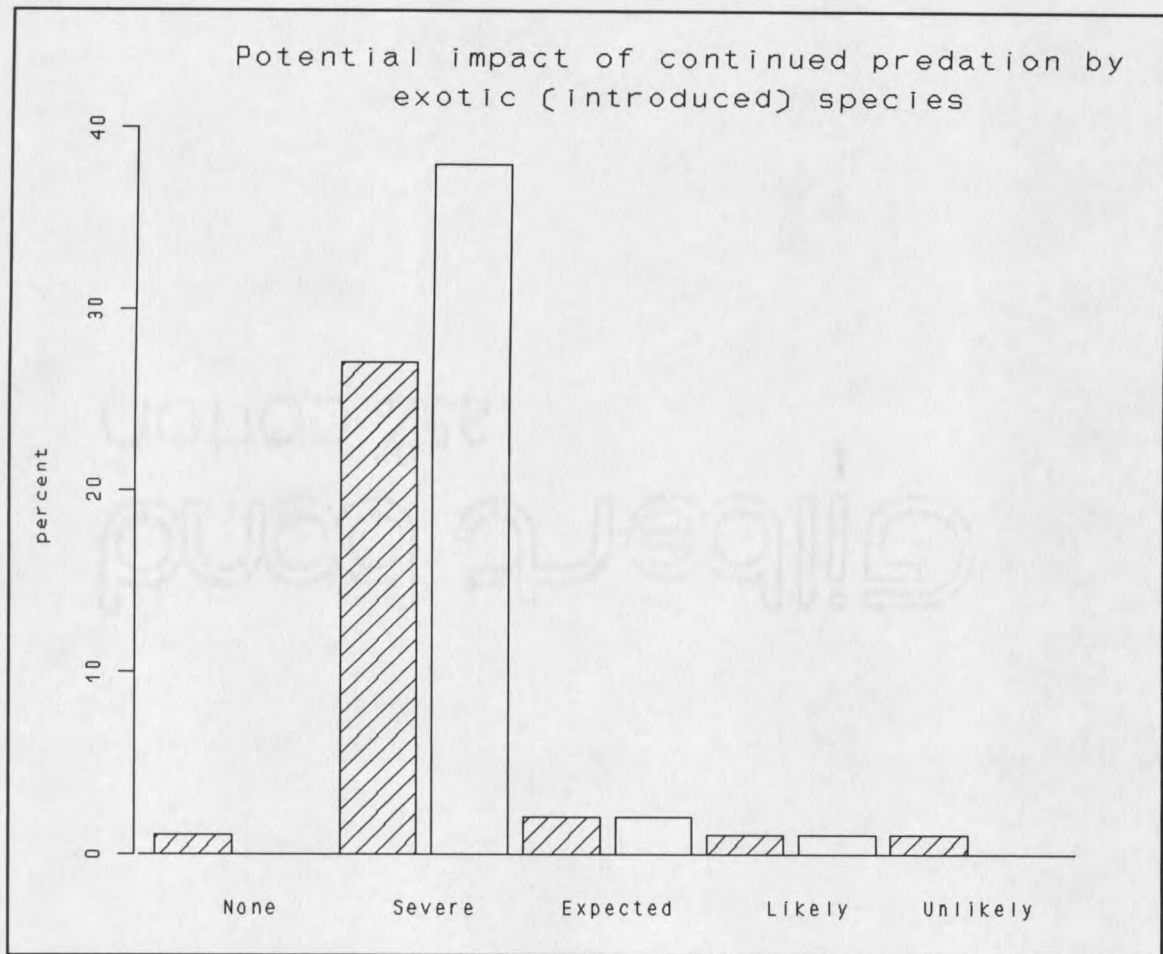


Figure 34. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable potential impact of continued predation by exotic species. Missing values for endangered and threatened species are 69% and 59% respectively.

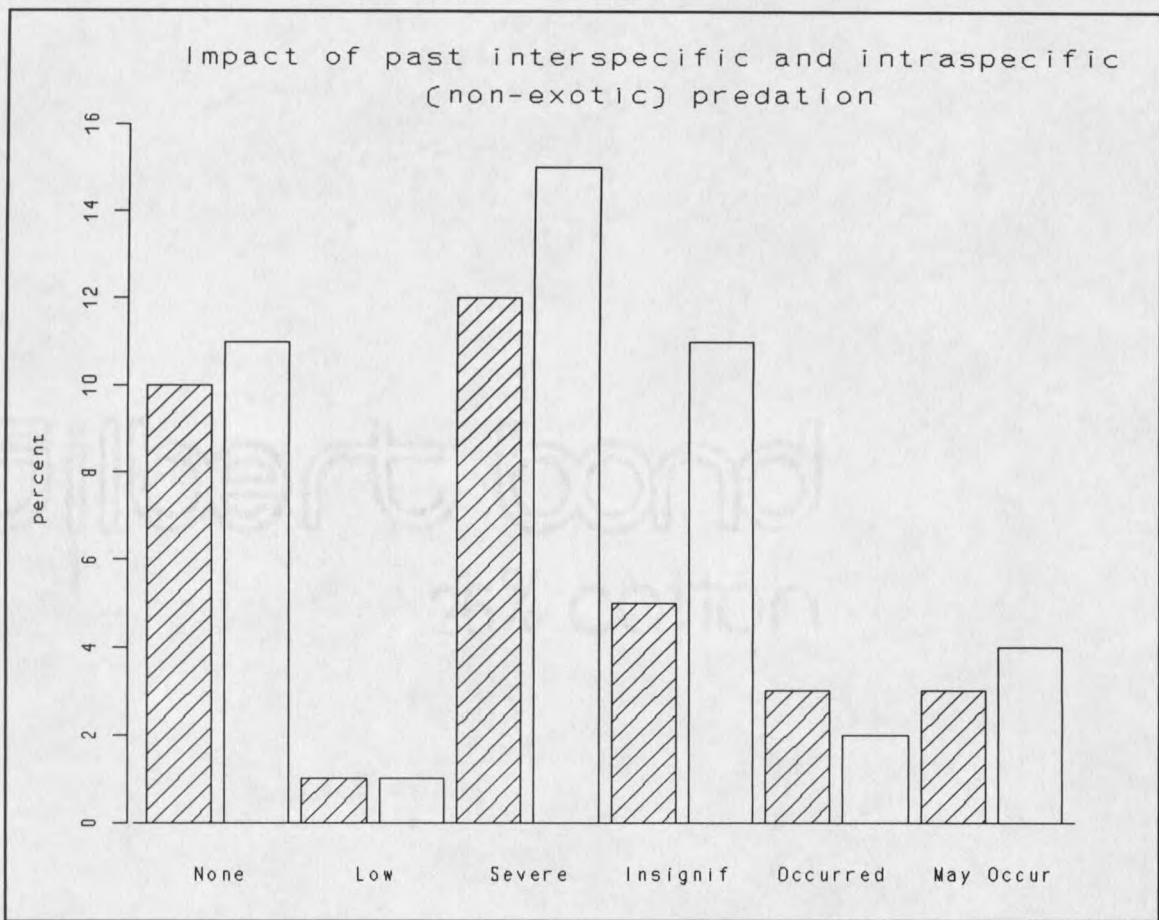


Figure 35. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable past impact of interspecific and intraspecific predation. Missing values for endangered and threatened species are 65% and 56% respectively.

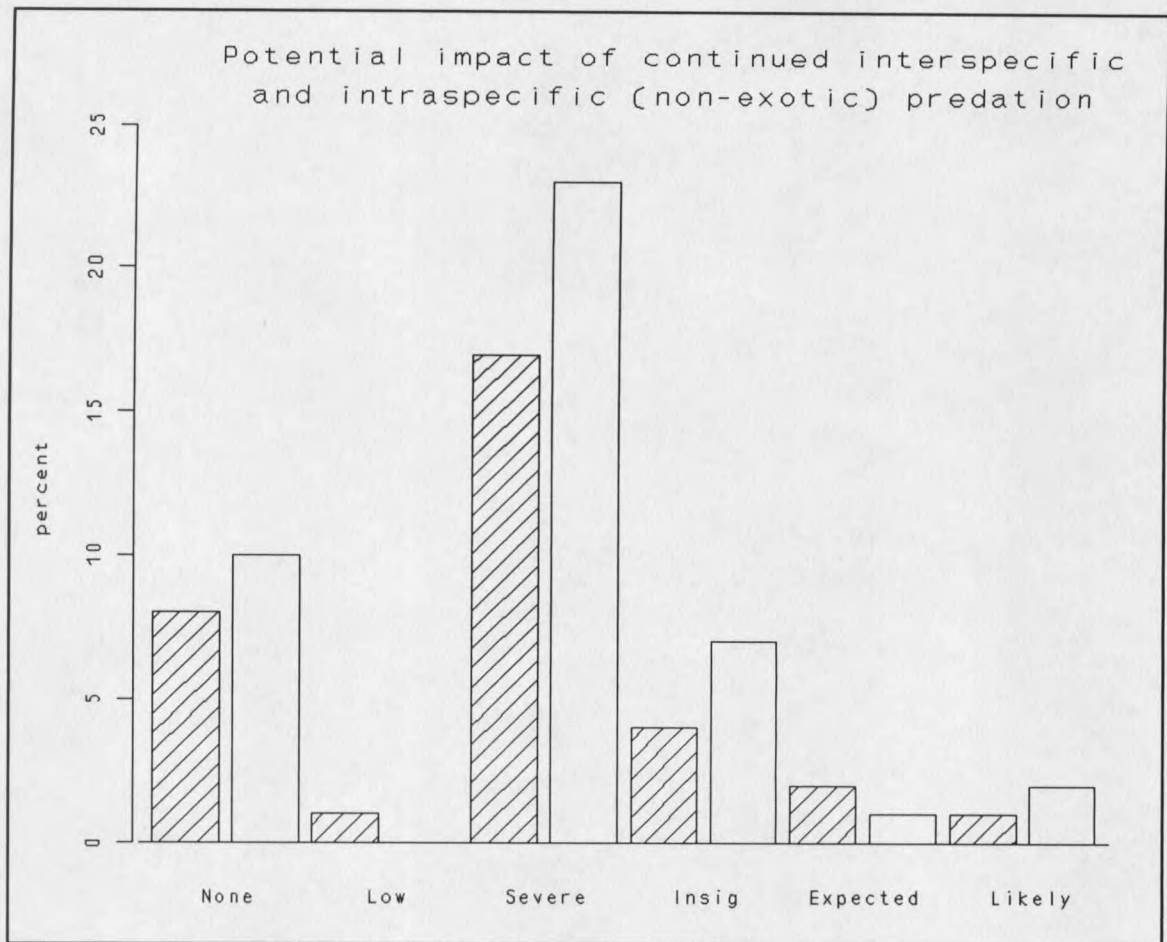


Figure 36. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable potential impact of continued interspecific and intraspecific predation. Missing values for endangered and threatened species are 68% and 57% respectively.

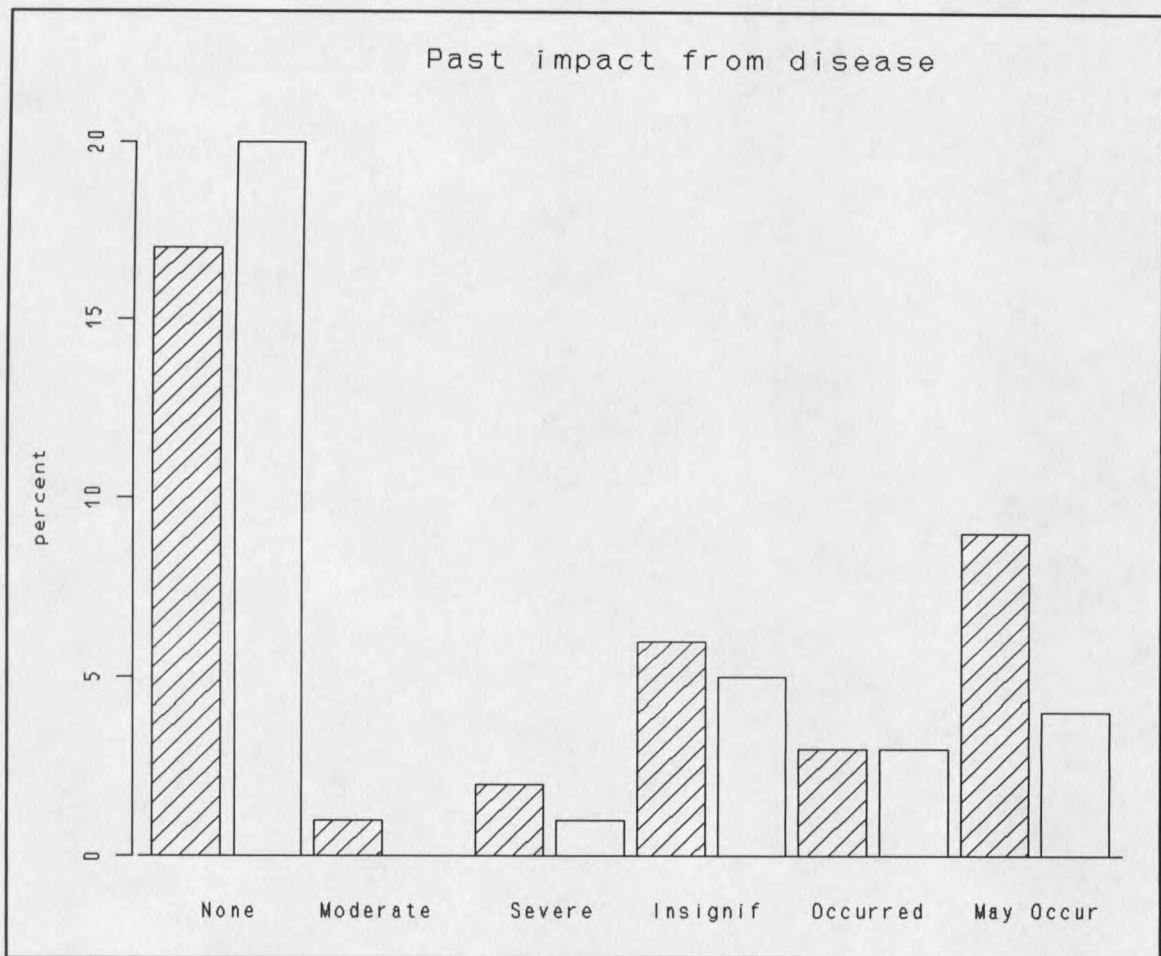


Figure 37. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable past impact from disease and parasites. Missing values for endangered and threatened species are 62% and 65% respectively.

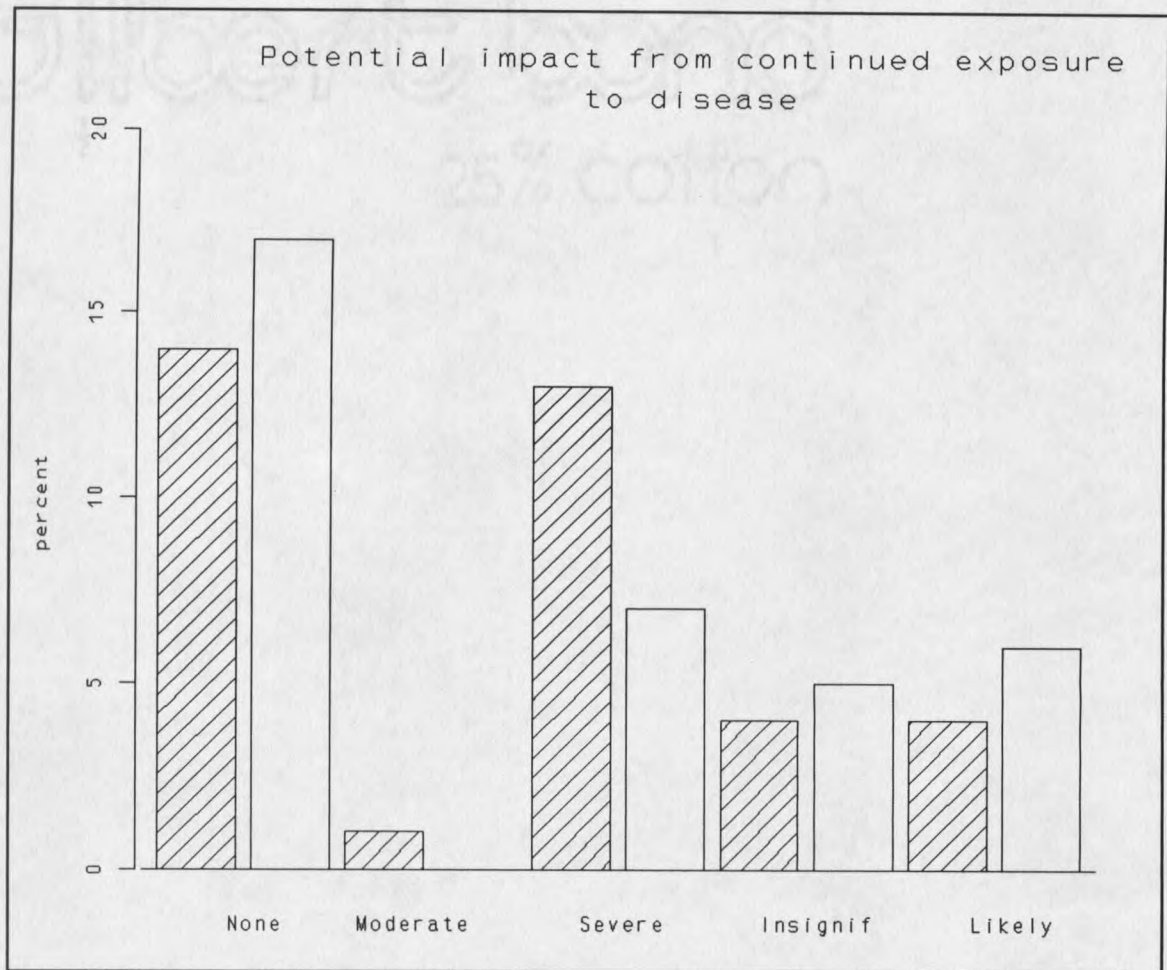


Figure 38. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable potential impact of continued exposure to disease and parasites. Missing values for endangered and threatened species are 65% and 63% respectively.

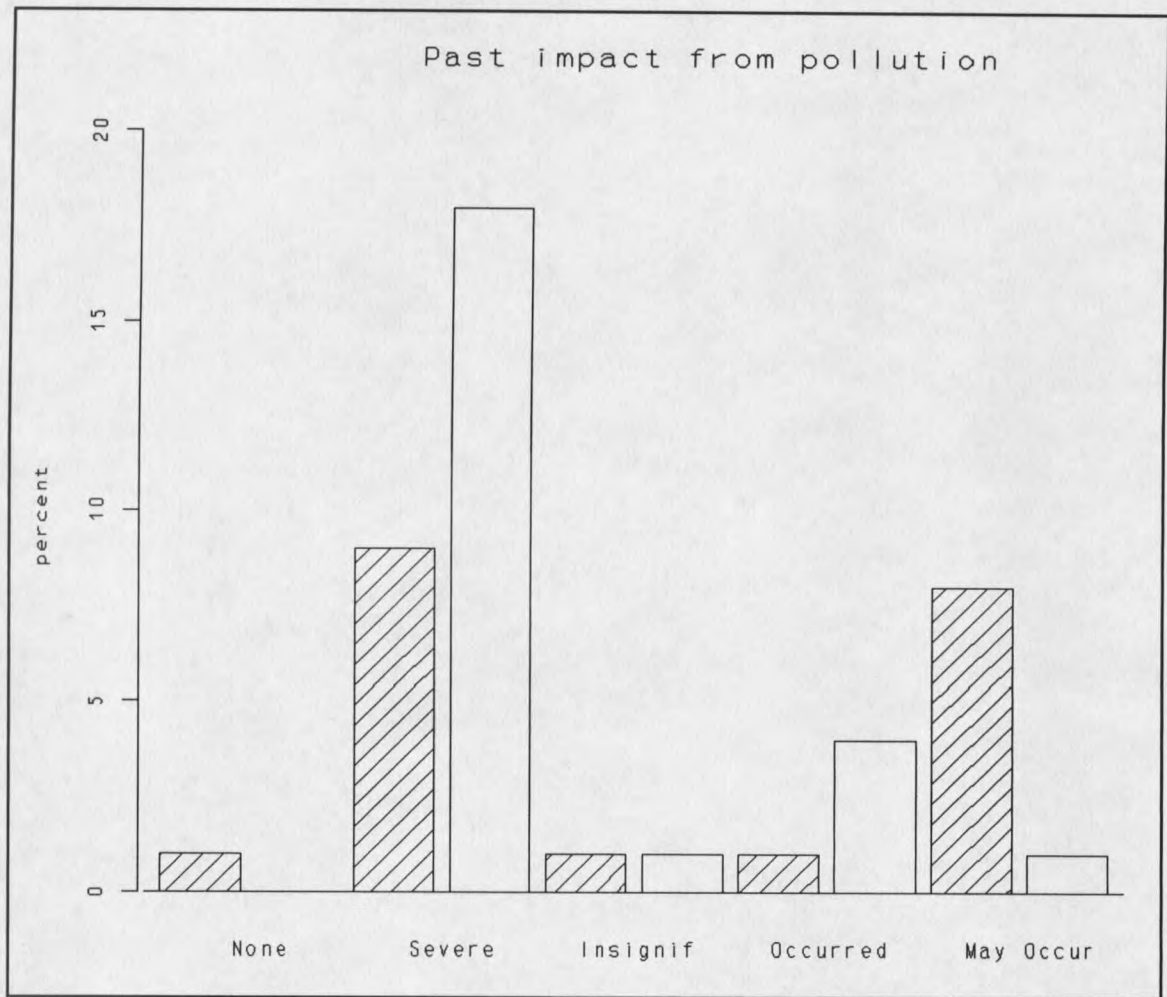


Figure 39. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable past impact from pollution. Missing values for endangered and threatened species are 80% and 75% respectively.

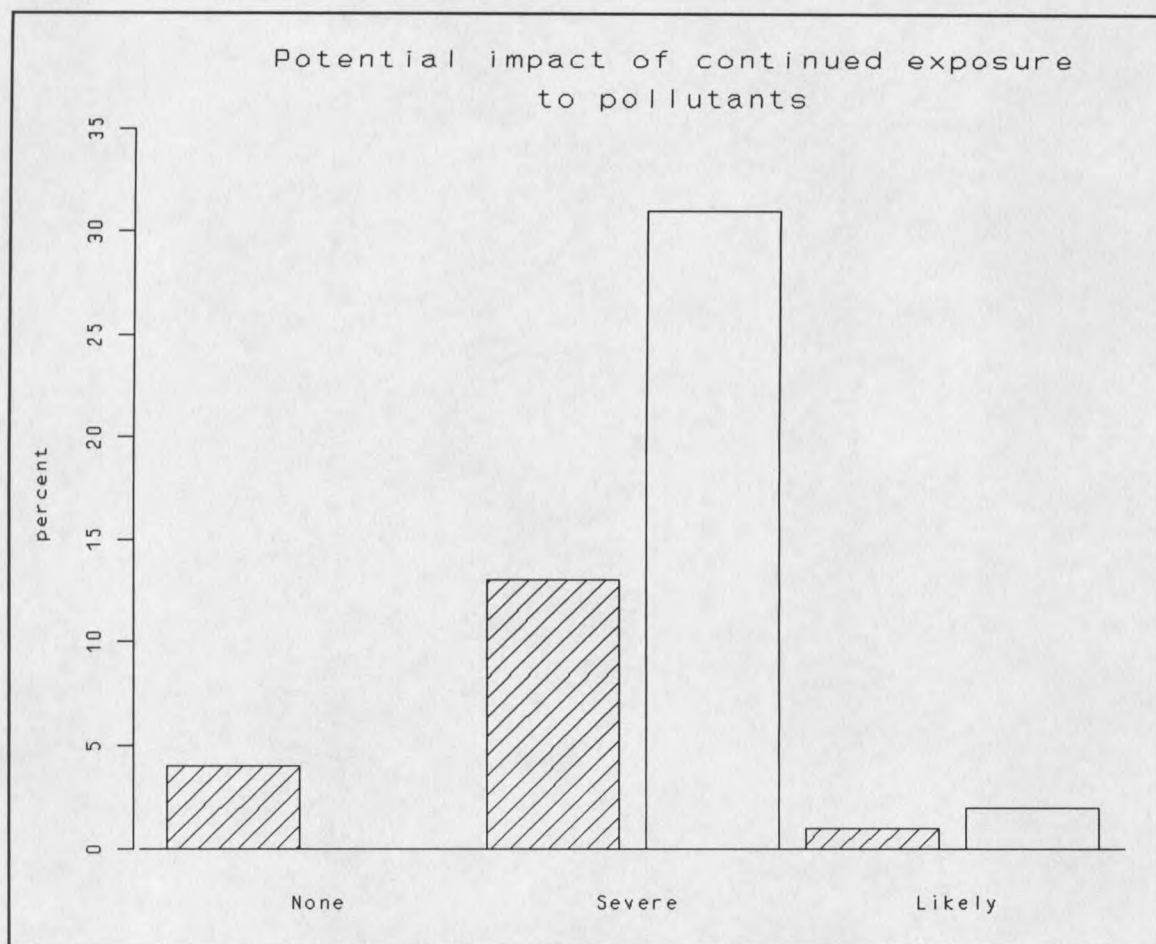


Figure 40. Comparison of the distribution of endangered species (////) with the distribution of threatened species (blank) for the qualitative variable potential impact of continued exposure to pollutants. Missing values for endangered and threatened species are 81% and 67% respectively.

APPENDIX E
CATEGORY 3A ANIMAL SPECIES

Appendix E. Category 3a animal species. Category 3a indicates domestic species which had been candidates for listing but are now thought to be extinct. Of the taxa delineated below, 7 were actually listed under the ESA and are so indicated by an E (endangered) or T (threatened) following their name.

VERTEBRATES

FISHES

Miller lake lamprey	Longjaw cisco E
Deepwater cisco	Blackfin cisco
Alvord cutthroat trout	Rio Grande bluntnose shiner
Independence valley tui chub	Tecopa pupfish E
Thicktail chub	Monkey springs pupfish
Phantom shiner	Whiteline topminnow
Blue pike E	Amistad gambusia E
Alvord chub	Maravillas red shiner
Clear lake splittail	

Total: 17 of 180 candidates for listing

AMPHIBIANS

Lowland leopard frog (San Felipe population)
Relict leopard frog

Total: 2 of 62 candidates for listing

REPTILES

Navassa Island iguana
Navassa curley-tailed lizard
St. Croix racer

Total: 3 of 73 candidates for listing

BIRDS

Texas Henslow's sparrow	Dusky seaside sparrow E
San Clemente Bewick's wren	Santa Barbara song sparrow E
Guam rufous-fronted fantail	Smyrna seaside sparrow

Total: 6 of 81 candidates for listing

MAMMALS

Insular long-tongued bat	Anastasia Island
Penasco least chipmunk	mouse
Sherman's southeastern pocket gopher	Chadwick Beach cotton
Goff's southeastern pocket gopher	mouse
Pallid oldfield beach mouse	Louisiana prairie vole
Woodland caribou (Montana population)	Texas margay

NOTE: The woodland caribou (MT population) was listed as 3A (extinct) in 50 CFR Part 17 January 6, 1989. However, was

listed as candidate category 2 in 50 CFR Part 17, on November 21, 1991. Total: 9 of 224 candidates for listing

INVERTEBRATES

SPONGES

Total: 0 of 5 candidates for listing

HYDROIDS

Total: 0 of 1 candidates for listing

FLATWORMS

Holsinger's groundwater planarian
Bigger's groundwater planarian

Total: 2 of 8 candidates for listing

EARTHWORMS

Total: 0 of 1 candidates for listing

OSTRACODS

Total: 0 of 3 candidates for listing

ISOPODS

Total: 0 of 11 candidates for listing

AMPHIPODS

Rubious Cave amphipod
Pickle springs amphipod

Total: 2 of 51 candidates for listing

FAIRY SHRIMPS

Total: 0 of 6 candidates for listing

CRAYFISHES & SHRIMPS

Total: 0 of 46 candidates for listing

SPIDERS

Total: 0 of 12 candidates for listing

PSEUDOSCORPIONS

Total: 0 of 16 candidates for listing

HARVESTMEN

Total: 0 of 7 candidates for listing

ROCKHOPPERS & BRISTLETAILS

Total: 0 of 2 candidates for listing

SPRINGTAILS

Total: 0 of 2 candidates for listing

MAYFLIES

Robust pentagenian burrowing mayfly
 Diverse isonychian mayfly
 Colorado burrowing mayfly

Total: 3 of 17 candidates for listing

DRAGONFLIES & DAMSELFLIES

Jugorum megalagrion damselfly
 Nesiotes megalagrion damselfly

Total: 2 of 39 candidates for listing

STONEFLIES

Robert's alloverlan stonefly

Total: 1 of 10 candidates for listing

COCKROACHES

Total: 0 of 1 candidates for listing

GRASSHOPPERS & ALLIES

Remote conehead katydid
 Antioch Dunes shieldback katydid

Total: 2 of 36 candidates for listing

ZORAPTERANS

Total: 0 of 1 candidates for listing

TRUE BUGS

Phyllostegian leaf bug

Total: 1 of 31 candidates for listing

CICADAS & ALLIES

Total: 0 of 17 candidates for listing

LACEWINGS & ALLIES

Total: 0 of 8 candidates for listing

BEETLES

Nickajack Cave beetle	Mono Lake diving beetle
Duck River Cave beetle	Tooth Cave blind rove
Fort Ross trigonoscute weevil	beetle
Yorba Linda trigonoscute weevil	

Total: 6 of 235 candidates for listing

SCORPIONFLIES & ALLIES

Total: 0 of 1 candidates for listing

FLIES

Valley mydas fly	Hawaiian chersodromian dance
Ko'olau spurwing long-legged fly	fly
Lanai pomace fly	El Segundo flower-loving fly
Volutine stonemyian tabanid fly	

Total: 6 of 19 candidates for listing

BUTTERFLIES & MOTHS

Chestnut ermine moth
 Chestnut casebearer moth
 Kona giant looper moth
 Ko'olau giant looper moth
 Hawaiian hopseed looper moth
 'Ola' a peppered looper moth
 Zerces blue butterfly
 Pheres blue butterfly
 American chestnut nepticulid moth
 'Poko' noctuid moth
 Midway agrotis noctuid moth
 Kerr's agrotis noctuid moth
 Laysan agrotis noctuid moth
 Procellaris agrotis noctuid moth
 Confused helioverpa noctuid moth
 Minute helioverpa noctuid moth
 Laysan dropseed noctuid moth
 Hilo hypenana noctuid moth
 Lovegrass noctuid moth
 Kaholuamano noctuid moth
 Sthenele wood nymph butterfly
 Atossa fritillary butterfly
 Willamette silverspot butterfly
 Strohbeen's parnassian butterfly
 Oahu swamp hedyleptan moth
 Laysan hedyleptan moth
 Telegraphic hedyleptan moth
 Blackburn's sphinx moth
 Chestnut leaf miner moth
 Kaholuamano noctuid moth

Total: 31 of 153 candidates for listing

CADDISFLIES

Athens long-horned caddisfly

Total: 1 of 79 candidates for listing

ANTS, BEES, & WASPS

Lanai yellow-faced bee (yfb)	Molokai yfb
Blackburn's yfb	Snowy yfb
Connected yfb	Pele yfb
Erythrodeme yfb	Perspicuan yfb

Hilaris yfb	Psammobian yfb
Finitiman yfb	Rugulose yfb
Monocolor yfb	Bristlefront yfb
Broadhead yfb	Maui yfb
Melanothrix yfb	Mutatan yfb

Total: 18 of 78 candidates for listing

MILLIPEDES

Total: 0 of 1 candidates for listing

SNAILS

Longstreet Spring snail
Fish Springs marshsnail
Greenfield rams-horn snail

Total: 3 of 295 candidates for listing

CLAMS & MUSSELS

Coosa elktoe (mussel)
Carolina elktoe
Sugarspoon (arc-form pearly mussel)
Angled riffleshell
Leafshell (arcuate pearly mussel)
Acornshell (acorn pearly mussel)
Narrow catspaw (Stones pearly mussel)
Forkshell (Lewis' pearly mussel)
Round combshell (fine-rayed pearly mussel)
Tennessee riffleshell (nearby pearly mussel)
Comberland leafshell (Steward's pearly mussel)
Sampson's pearly mussel E

Total: 12 of 84 candidates for listing

PLANTS

Total: 94 of 2219 candidates for listing

NOTE: 77 of the 94 designated 3A plant species are native to Hawaii. There are also an additional 87 plant species that are thought to be possibly extinct and 5 which are thought to be extinct in the wild but extant in cultivation.

Grand Total: 221 domestic taxa have been designated as 3a (thought to be extinct) by FWS of the 4122 domestic taxa that are candidates for listing (50 CFR Part 17, 1991 for animals and 50 CFR Part 17 February 21, 1990 for plants). The total of 221 designated 3A taxa does include the 7 listed species that are now thought to be extinct.

APPENDIX F
DATA CLASSIFICATION FORM

Appendix F. Data classification form: Endangered and threatened species. Variable types and categories derived from final listings.

Note 1: For unreported variables: -1 = not applicable; -2 = not mentioned; -3 = mentioned but unknown. The capitalized acronyms associated with each variable name are the column headings in the database (Appendix H).

Note 2: For those 12 variables that have both numeric and descriptive data values: If a numeric data value was not identified but a descriptive data value was, assign a -2 to the numeric variable (unless the Service states that the numeric data value is unknown). If a numeric data value is identified and a descriptive data value is not identified, assign a -1 to the descriptive variable. If neither a numeric nor a descriptive data value is identified, assign both variables a -2. If both numeric and descriptive data values are identified, both variables are assigned a data value.

Computer

Columns	Variable Name	Variable Code (Core Terms)
1-2	Species Type (capitalized abbreviations found after the variable name are what will be found in the data files) USFR	1=AEM=United States (US) Endangered Mammal 2=FEM=Foreign Endangered Mammal 3=BEM=Both US and Foreign Endangered Mammal 4-6=AEB, FEB, BEB (E Bird) 7-9=AEF, FEF, BEF (E Fish) 10-12=AER, FER, BER (E Reptile) 13-15=AEP, FEP, BEP (E Plant) 16-30=ATM=as above Threatened instead of Endangered
3-5	Species Number ID	#=001-999
6-8	Species Number (after removal of delistings and reclassifications) NEWID	#=001-999
9	Species Group GRP	1=mammals 2=birds 3=fish 4=reptiles 5=plants 6=marine mammal
10-41	Name NAME	Common or Scientific Name

42-43	USFWS Listed Classification FWS	1=populations 2=subspecies 3=species	4=polytypic species
44-45	Range and Numbers Listed RG	1=entire range and numbers 2=partial range and numbers	
46-53	Date of Initial Petition or Status Review (regarding current spp listing) DATEI	Month/Day/Year	
54-61	Date of Final Listing (in FR) DATEII	Month/Day/Year	
62-63	Year of Final Listing (in FR) DATE	Year (last two digits)	
64	Endangered or Threatened ET	1=Endangered 2=Threatened	3=reclass T to E 4=reclass E to T
65	Class and Degree of Threat ETGRP	M=E Mammal m=T Mammal B=E Bird b=T Bird	F=E Fish f=T Fish R=E Reptile r=T Reptile
66-72	Historic Numbers HSTNMN	Numeric value	
73-74	Historic Numbers HNC	Descriptive value 1=rare/small 3=abundant	2=common
75-81	Final Listing Estimate of Total E/T Individuals INDIVN	Numeric value Note: If given range of values assign midpoint.	
82-83	ditto IC	Descriptive value 1=possibly extinct/not discovered in recent surveys 2=extremely: rare/low/small/ scarce 3=rare/low/small/scarce 4=common/good/strong/viable/ moderate/sizeable/satisfactory 5=abundant/substantial	

- | | | |
|---------|---|---|
| 84-85 | Historic Geographic Distribution (Range)
Note: Breeding Range categories are specific to Birds & Fish
HSDIS | 1=widespread
2=restricted/limited
3=endemic/known only from
4=widespread (breeding range), migratory |
| 86-87 | Current Geographic Distribution of E/T Populations (Range)
CRDIS | 1=widespread
2=restricted/limited
3=relict (remnant from a once more widespread distribution)
4=relict (described in listing as also being disjunct and isolated)
5=endemic (native with limited distribution)
6=single, contiguous restricted area as a marsh or an island (movement within but not out of area)
7-10=as 1-4 (breeding range) with migratory status
13=captive populations only |
| 88-89 | Total Number of E/T Populations
POP | Numeric value |
| 90-91 | ditto
POPC | Descriptive value
1=rare/small/few
2=moderate/several
3=numerous/abundant
4=populations (no indication of numbers) |
| 92-93 | E/T Populations: Isolated or Contiguous
ISOL | 1=contiguous 5=small, fragmented
2=isolated (no indication of isolation)
3=both
4=one area
6=one area isolated from conspecifics |
| 94-99 | Smallest E/T Pop. (# of individuals)
SMPOP | Numeric value |
| 100-101 | ditto
SPC | Descriptive value as 82-83 above |

102-108	Largest E/T Pop. LGPOP	Numeric value
109-110	ditto LGC	Descriptive value as 82-83 above
111-116	Median E/T Pop. MDPOP	Numeric value
117-118	ditto MPC	Descriptive value as 82-83 above
119-120	E/T Population Trend (using most current measured decline, over any period of time, for a major portion or the entire E/T population) TRDN	Numeric value % decline Note: FWS often gives a percent decline but the time period over which the decline is measured is not constant across listings.
121-122	ditto TC	Descriptive value 1=stable 2=increase 3=decline 4=decline slight 5=decline significant 6=decline precipitous/greatly depleted 7=increase slight 8=increase significant
123-124	Historic Range Lost (by direct or indirect human disturbance) RGLSN	Numeric value (%) Note: The only case of range lost due to natural causes from 1976 to present (as delineated in the FR) is the Florida salt marsh vole.
125-126	ditto RLC	Descriptive value 0=has not occurred/none known 1=low 2=moderate 3=high/severe/most/major significant/substantial/ threatened/much/many 4=insignificant/not thought to be significant or a major problem 5=has occurred 6=may have occurred

127-128	Expectation of Continued Range Loss EXRGL	0=none 1=low 2=moderate	3=high 4=expected to occur
129-130	Habitat Specific HBSP	1=specialist 2=generalist	
131-132	Status of Occupied Habitat (geographic distribution/ contiguity) HBST	1=common & contiguous 2=common & patchy/fragmented 3=rare & contiguous 4=rare & patchy/tiny fragments 5=one area (island) & contiguous 6=one area(island) & patchy 7=rare & limited (fragmentation is not mentioned) 8=shift from prime to marginal habitat	
133-134	General Habitat Lost including nesting, denning, spawning, rookery habitat HBLSN	Numeric value (%)	
135-136	ditto HLC	Descriptive value as 125-126 above	
137-138	Expectation of Continued Habitat Loss EXHBL	Descriptive value as 127-128 above	
139-140	Forage/Prey/ Pollinator Specific PRYSP	1=specialist 2=generalist	
141-142	Status of Forage/Prey/ Pollinator (geo- graphic distri- bution/numbers) PRYST	1=common & abundant 2=common & rare 3=uncommon & locally abundant 4=uncommon & rare 5=reduced availability 6=not a limiting factor 7=forage is of poor quality 8=prey availability fluctuates 9=limiting factor	
143-144	Impact of Past Natural Catas- trophes CAT	Descriptive value as 125-126 above	

- 145-146 Potential Severity of Future Natural Catastrophe
IMPCT
- 0=no impact/none known
1=low impact
2=moderate impact
34=severe/high impact/significant impact/threatened (extirpation may be mentioned as a possibility)
5=insignificant impact
6=is expected to occur
7=may occur
8=not expected to occur
- 147-148 Impact of Past Predation by Humans (includes "incidental take" and mortality caused by disturbance of nesting sites, flooding of habitat etc. that resulted in direct mortality)
HMPRD
- Descriptive value as 125-126 above
- 149-150 Potential Impact of Continued Predation Reasons: Food, Fur, Ivory, Pet Trade, Biomedical and Medicinal, Pest
IMPH
- Descriptive value as 145-146 above
- 151-152 Impact of Past Interspecific (non-exotic/native) and Intraspecific Predation and/or Displacement and/or Genetic Swamping
SPPRD
- Descriptive value as 125-126 above
- 153-154 Potential Impact of Continued IS Predation
IMPS
- Descriptive value as 145-146 above
- 155-156 Past Impact From Exotic (Introduced) Species
EXOT
- Descriptive value as 125-126 above

157-158	Potential Severity of Continued Impact Includes: Predation, Genetic Swamping, Competition IMPE	Descriptive value as 145-146 above
159-160	Past Impact from Pollution (includes chemical spills, pesticides, siltation etc.) POLL	Descriptive value as 125-126 above
161-162	Potential Severity of Cont. Impact IMPP	Descriptive value as 145-146 above
163-164	Past Impact from Disease and/or Parasites DIS	Descriptive value as 125-126 above
165-166	Potential Severity of Continued Impact IMPD	Descriptive value as 145-146 above
167-168	Genetic Problems Inbreeding, Loss of Genetic Variability Note: Does not include hybridization that is built into Inter-specific and/or Exotic Predation/ Impact GEN	0=none 1=low/poor 2=moderate 3=high 4=potential low 5=potential moderate 6=potential high 7=potential for problems exists
169-170	Demographic Stochasticity (Problems Related to) DEM	Descriptive value as 167-168 above (7=potential for severe fluctuations exists)
171-172	Litter Number LTRN	Numeric value # of young produced per litter
173-174	Reproductive Rates (current) LTRC	Descriptive value as 167-168 above (8=reproductive rates are declining)

- 175-176 Infant Mortality: Numeric value (%)
likelihood that
individual will not
survive to a particular age within the E/T
population (mortality includes removal of infant from
population).
INMRT
- 177-178 ditto Descriptive value
IMC 1=low 4=significant
2=moderate 5=insignifi-
3=high cant
- 179-180 Persistence Time Numeric value (in years)
(estimated)
PRSN
- 181-182 ditto Descriptive value
PC 1=low/until end of century
2=moderate
3=high
- 183-184 Current Level of Descriptive value
Legal Protection 0=none protected/not adequate/
from "Take" uncontrolled hunting
(includes regulated 1=few populations
protection through protected from "take" by
license &/or state and/or national
permit legislation
2=moderate numbers of
Note: If poaching populations protected from
is mentioned as a "take" by state and/or
problem then by national legislation
definition 1 or 3=most populations protected
more populations from "take" by state and/or
must be technically national legislation
protected from 4=all populations protected
"take" assign a 2. from "take" by state and/or
LEGL national legislation
- 185-186 Protection from 1=Listed IUCN endangered
other Acts 2=Listed IUCN vulnerable
and/or Recognized 3=Listed CITES APP. I
by IUCN 4=Listed CITES APP. II
Note: All species 5=Listed IUCN E and CITES I
being reclassified 6=Listed IUCN V and CITES I
are currently 7=Listed IUCN E and CITES II
protected under 8=Listed IUCN V and CITES II
the ESA. 9=Listed MMPA
ACT 10=Listed IUCN, CITES & MMPA
11=No indicated protection
from other Acts
12=CITES and MMPA/MBTA

13=MBTA
 14=MBTA and BGEPA
 15=LACEY ACT

187-188	Effectiveness of Protection from "Take" EFF	1=effective 2=ineffective 3=no protection
189-190	Current Level of Habitat Protection HBPRN	Numeric value=% of habitat protected by state and/or national and/or private conservation groups
191-192	Current Level of Habitat Protection (protection by state and/or national and/or private groups) HPC	Descriptive value as 183-184 above (substituting "areas of habitat" for "numbers of populations" and "degradation" for "take")
193-194	Major Reason for Habitat Loss and/or Range Loss HBLS	1=urbanization and development 2=slash and burn agriculture 3=logging (includes accessibility into previously inaccessible habitat via logging roads) 4=logging and slash and burn agriculture (general deforestation) 5=agricultural development (other than slash & burn) 6=hydroelectric dams 7=water diversion projects 8=filling and/or draining of wetlands 9=transportation corridors 10=livestock grazing 11=human disturbance 12=military activity 13=pollution/siltation 14=mining/timber/agriculture 15=mining 16=mining &/or agriculture
195-196	Unique Habitat UHB	1=Yes 2=No
197-198	Ecological Association with other E/T species ETA	1=Yes

199-200	Number of Associated E/T or Candidate Species NME	Numeric value
201-202	Extinction EXT	1=once thought to be extinct, 2=never thought to be extinct/ not mentioned in FR
203-204	Emergency Listing EMR	1=has been emergency listed 2=has never received emergency listing/not mentioned in FR
205-208	Active Nests ACTNSN	Numeric value
209-210	Nesting/Spawning Success SUCN	Numeric value (%)
211-212	ditto SUCC	Descriptive value as 167-168 above
213-214	Primary Reason Nesting/Spawning Failure FAIL	1=nest predation by native &/or exotic species 2=eggshell thinning and/or effects of pesticides/pollution 3=humandisturbance (trampling of nests, separation of chicks from adults etc.) 4=loss of nesting/spawning habitat 5=human predation
215-216	Age at Maturity (Female) MAT	Numeric value
217-218	Occupied Drainages OCDR	Numeric value
219-220	Occupied Tributaries OCTRN	Numeric value
221-222	ditto OTC	Descriptive value 0=none 1=few 2=moderate 3=numerous 4=tributaries (no indication of numbers)

223-224	Populations Lost POPLS	Numeric value
225-226	Special Rules allowing "take" TAKE	1=yes 2=no or not mentioned in FR

APPENDIX G
DATA CODIFICATION FORM

Appendix G. Data codification form of descriptive variables and their discrete categories. This appendix presents the author's translation of the narrative biological information, found in the final listings, into specific descriptive variables and their discrete categories.

Note: The first term presented within each discrete category below is the "core" term. The following words or phrases separated by a backslash (/) are the additional words and/or phrases which also triggered assignment to that particular category. (Specific species may be mentioned in brackets). Definitions are provided in parentheses if they clarify distinctions between the discrete categories. The section (Notes) following each listing of the descriptive variable and its discrete categories will delineate, if necessary, any exceptions and/or interesting examples and/or any particular difficulties that the author found or had with that particular variable and its categories.

The Notes section will also, as applicable, discuss any special exceptions and/or explanations which are necessary for the discrete quantitative data values for that same variable (if there are such values).

This appendix can be used in conjunction with Appendix F (the data classification form). The capitalized acronyms associated with each variable name are the column headings in the database (Appendix H) and are also found in the data classification form (Appendix F).

Variable

Categories

Historic Numbers	1=rare/small/scarce/low
HNC	2=common/moderate/sizeable/viable/
	3=abundant/substantial/numerous

Note 1. The listing for the red-necked amazon parrot reports that historically there were "clouds of parrots... thousands". Author assigned a 3 (abundant).

Total E/T individuals	1=possibly extinct/not discovered
Remaining in wild	in recent surveys
IC	2=extremely: rare/low/small/scarce/ barely hanging on
	3=rare/low/small/scarce/severalhundred [Independence valley speckled dace]
	4=common/good/strong/viable/ moderate/sizeable/satisfactory/ few thousands [Newell's manx shear- water]/ not in immediate danger of extinction
	5=abundant/substantial/millions of individuals remaining [Waccamaw silverside]/numerous

Note 1. The numeric value used by the author, for the discrete quantitative variable number of individuals remaining (INDIVN), was the most recent and best estimate provided in the final listing. Population estimates from different localities were summed if necessary. If a range of values was provided for the variable, the range mid-point was used. For the Mariana gallinule a range (150-200 birds remaining) was given for the main population. In this case, the author used the upper limit of the range because the Service stated that there were three additional extremely small populations in existence. For the Formosan sika, the range estimate was given as 100-200 individuals in captivity. The numeric estimate for individuals remaining in the wild therefore is 0. For the bald eagle, the estimates for individuals remaining are based upon adults at active nest sites.

Historic	1=widespread/species has been
Geographic	extirpated from large areas or countries
Distribution	2=restricted/limited
(Range)	3=endemic/known only from
HSDIS	4=widespread (breeding range), migratory
Current	1=widespread
Geographic	2=restricted/limited/confined/localized/
Distribution	3=relict (remnant from a once more
(Range) of E/T	widespread distribution)/restricted to a
Populations	remnant of its former range/remnant/
CRDIS	currently confined to/extirpation in
	areas of range
	4=relict (as 3 above but also
	described as being disjunct/
	isolated/separate/relictual distribution
	in widely scattered areas...restricted to
	isolated areas separated by vast stretches
	of unsuitable habitat/insularization/
	confined to mangrove swamps on a few small
	islands... little or no gene flow between
	remaining populations [Cabrera's hutia]/
	potential for recolonization and dispersal
	to previously occupied areas remote
	5=endemic (native with limited
	distribution)/native/historically
	restricted or confined to/system of
	reserves [Japanese macaque]/found only in
	6=single, restricted area (marsh, key,
	cay, island, mangrove swamp... movement
	within but not out of area)/known only
	from one site/
	7-10=as 1-4 (breeding range) with
	migratory status
	13=captive populations only

Note 1. When one or more terms and/or phrases were used the term which was most definitive and accurate was assigned. Some categories superseded others by their more definitive nature.

Example: The distribution of the Lower keys rabbit is variously described as "restricted", "found only in", "limited", "occurs in small disjunct populations", "found only in Florida now only on a few Lower keys". The assignment to category 4 recognizes a distribution which is a remnant of what it used to be and recognizes the "disjunct" nature of that remaining distribution.

Example: The distribution of the Florida salt marsh vole was described as being both "relictual" and "known only from one site". Assignment was to category 6.

"Endemic" was used, if the Service used the term, and if no more definitive description was given.

"Restricted" was used, if the Service used the term, and if no more definitive description given. A description of historic range reduction triggered assignment to category 3 or 4 ("relict" distributions). If the term "restricted" was used and a description of a relict distribution was also given, assignment to category 3 or 4 ("relict" distribution) superseded assignment to category 2 ("restricted"). In other words, if the range was clearly relictual, from the narrative in the listing, the author assigned relict distribution to that species regardless of whether the term "restricted" was used.

Examples: Sichuan, Yunnan, and Guizhou snub-nosed monkeys are described as having a "restricted" distribution. However, the listing also states that the ranges for these monkeys have declined substantially. A description such as this triggered assignment to a "relict" distribution category. Such an assignment recognizes the more definitive range description.

Example: The Guadalupe fur seal is "largely restricted to a remnant of its former range" triggered assignment to a "relict" category.

Category 6 (current distribution is a single area) superseded every other category if it was used in conjunction with another "core" term.

Note 2: Areas abandoned because of human presence and not because of actual range loss (range has technically not been lost but is not being used) were assigned "restricted" and not "relict".

Examples: Caves abandoned by Virginia big-eared bats because of spelunkers. Species hunted to extirpation in some areas (Western giant eland).

Note 3. The author was careful to distinguish between range loss and habitat loss.

Example: The Atlantic marsh snake while retaining its range has lost vast amounts of habitat within that range.

Example: The Coachella valley fringe-toed lizard had a historical range of 324 square miles and a current range which had been reduced to 236 square miles with only 120 square miles of habitat remaining.

Total Number of E/T Populations Remaining POPC	1=few/rare/small 2=several/moderate 3=numerous/abundant 4=populations (no indication of numbers)
E/T Populations: Isolated or Contiguous ISOL	1=contiguous 2=isolated/disjunct/separate populations /extremely localized/potential for recolonization and dispersal to previously occupied areas is remote 3=both 4=one area 5=small, fragmented (no indication of isolation) 6=one area isolated from conspecifics

Note 1. Amber darter was assigned a 2 because a second isolated population is thought to exist.

Smallest E/T Pop. as IC above

(# of individuals)
SPC

Largest E/T Pop. as IC above
LGC

Median E/T Pop. as IC above
MPC

E/T Population Trend TC	1=stable 2=increase 3=decline/downward trend 4=decline slight 5=decline significant/substantial/ persistent/notable/populations are being significantly reduced 6=decline precipitous/populations are disappearing rapidly/drastic/dramatic/ populations are being decimated... have been decimated 7=increase slight 8=increase significant
-------------------------------	--

Note 1. African elephant was listed as having stable populations in 4 countries, a trend increase in 1 country, a declining trend in 18 countries, and a rapid decline in 5 countries. The author assigned a 5 = significant (overall) decline.

Historic Range	0=has not occurred/none known
Lost (by direct	1=low/minor
or indirect human	2=moderate
disturbance)	34=high/severe/most/major
RLC	significant/substantial/ threatened/much/many/extensive loss/ widespread loss/serious/detrimental/ contributed to decline/has been adverse to survival/chief cause of decline/ decreased greatly/has caused reduced numbers/main cause/excessive/ adversely affecting reproduction/ resulting in heavy mortality
	5=insignificant/not thought to be significant or a major problem/minimal
	6=has occurred/downward trend
	7=may have occurred/suspected

Note 1. The Goodenough Gambusia has apparently lost all of its original range. The Owens tui chub has less than 1% of its range remaining. Author assigned both a 99% range loss for the discrete quantitative variable.

Note 2. For the discrete quantitative variable, a numeric estimate of range lost (RGLSN) was used if provided. A numeric value for range loss was computed, by the author, if the necessary values were provided.

Example the final listing for the Concho water snake reported that the historical range was equivalent to 276 miles of waterway and that 77 miles at the upper end of the range had been lost. This is equivalent to a loss of 27 percent of the original range.

Expectation	0=none
of Continued	1=low
Range Loss	2=moderate
EXRGL	3=high/many/much
	4=expected to occur

Habitat Specific	1=specialist/mentions species specific
HBSP	requirements
	2=generalist/able to occupy and/or utilize a wide variety of habitats

Status of
Occupied Habitat
(geographic
distribution/
contiguity)

HBST

1=common & contiguous
2=common & patchy/fragmented
3=rare & contiguous
4=rare & patchy/tiny fragments/
restricted & fragmented
5=one area (island) & contiguous
6=one area(island) & patchy
7=rare/limited (fragmentation
is not mentioned)
8=shift from prime to marginal
habitat

General Habitat
Lost including
nesting, denning,
spawning, rookery
habitat

HLC

as RLC above

Expectation of
Continued Habitat
Loss

EXHBL

as EXRGL above

Forage/Prey/
Pollinator
Specific

PRYSP

1=specialist
2=generalist

Status of
Forage/Prey/
Pollinator (geo-
graphic distri-
bution/numbers)

PRYST

1=common & abundant
2=common & rare
3=uncommon & locally abundant
4=uncommon & rare
5=reduced availability
6=not a limiting factor
7=forage is of poor quality
8=prey availability fluctuates
9=limiting factor

Impact of Past
Natural Catas-
trophes

CAT

as RLC above

Potential Severity
of Future Natural
Catastrophe

IMPCT

0=if occurs... no impact/none known
1=low impact
2=moderate impact
34=severe/high impact/significant
impact/threatened/extirpation of
1 or more populations may be
mentioned as a possibility/
particularly vulnerable/serious

5=insignificant impact
 6=is expected to occur
 7=may occur
 8=not expected to occur

Impact of Past as RLC above
 Predation by
 Humans (includes
 "incidental take" and
 mortality caused by disturbance of nesting sites, flooding of
 habitat etc. that resulted in direct mortality)
 HMPRD

Potential Impact as IMPCT above
 of Continued Pred-
 ation (reasons include:
 take for food, fur, ivory,
 pet trade, biomedical, and medicinal and pest)
 IMPH

Impact of Past as RLC above
 Interspecific
 (non-exotic/native)
 and Intraspecific
 Predation and/or
 Displacement and/or
 Genetic Swamping
 SPPRD

Potential Impact as IMPCT above
 of Continued IS
 Predation
 IMPS

Past Impact From as RLC above
 Exotic (Introduced)
 Species
 EXOT

Potential Severity as IMPCT
 of Continued
 Impact Includes:
 Predation, Genetic
 Swamping, Competition
 IMPE

Past Impact as RLC above
 from Pollution
 (includes chemical
 spills, pesticides,
 siltation etc.)
 POLL

Potential Severity as IMPCT above
of Continued Impact
IMPP

Past Impact from as RLC above
Disease and/or
Parasites
DIS

Potential Severity as IMPCT above
of Continued Impact
IMPD

Genetic Problems	0=none
Inbreeding, Loss	1=low/few/lack of/marginal
of Genetic	2=moderate
Variability	3=high
Note: Does not	4=potential low
include hybrid-	5=potential moderate
ization that is	6=potential high
built into Inter-	7=potential for
specific and/or	problems exists/is a threat
Exotic Predation/ Impact	
GEN	

Demographic	as GEN above
Stochasticity	(7=potential for severe fluctuations
(Problems	exists)
Related to)	
DEM	

Successful	0=none/no evidence of recruitment
Recruitment/	1=low frequency/poor/few/lack/marginal/
Reproductive	few eggs per year/recruitment
Success/	significantly reduced/recruitment is
Reproductive	low/eggers are major cause of decline/
Rates	reproduce slowly/absence of recruitment
LTRC	at several sites/severe reduction in
	reproductive success/most adults are not
	breeding/few eggs per life-span
	2=moderate/good
	3=high
	4=potential low/poor/marginal
	5=potential moderate/good
	6=potential high/high reproductive success
	with the presence of humans (scare gulls
	away from nests)
	7= <u>potential</u> for problems exists/
	is a <u>threat/could</u> have negative effect/
	<u>indicates</u> problems with recruitment/

reproductive breeding level may be affected or reduced/breeding failure may have contributed to decline/displacement into marginal habitat may reduce breeding success

8=reproductive rates are declining/
productivity or recruitment declining/
recruitment loss is occurring/

Note 1. Listings for the Concho water snake, Hierro giant lizard and Chihuahua chub all stated that reproduction is occurring but that it is not known to what degree it is successful. The author gave all a -3 for mentioned but unknown.

Note 2. The Caraccra listing stated that the bird had low reproductive rates and that the bird is successfully reproducing. Author assigned low rates (category 1).

Note 2. The numeric value used by the author, for the discrete quantitative variable *litter number* (or number/clutch or number/nest) was the most recent estimate provided. The author

used the range mid-point for those few listings where a range was provided.

Infant Mortality:	1=low
mortality of	2=moderate/predation and collection
infants,	of young is occurring
juveniles,	3=high/low offspring survival/heavy
subadults	predation on turtles at nest sites/
(mortality	major/collection of juveniles has...
includes	led to serious population decline/
removal of	important cause of reduction/nearly
young from	complete/large "kills"/severe/main
population)	threat to continued survival/ shark
IMC	predation on pups reduces population
	levels/heavy loss/
	4=significant/threat/impacts/relatively/
	something is adverse to survival of
	juveniles (trampling, separation of young
	from adults)
	5=insignificant

Note 1. The listings for the pallid sturgeon and the bonytail chub report that if reproduction is occurring, survival of young is apparently not. Author assigned both a 99% infant mortality rate for the discrete quantitative variable. For the Northern spotted owl several infant mortality rates were provided for different geographic areas. Author took the mid-range value.

Note 2. Juvenile mortality thought by many to be significant, but not known, gets a -3 for mentioned but unknown.

Persistence Time
PC
1=low/until end of century
2=moderate
3=high

Current Level of
Legal Protection
from "Take"
(includes regulated protection
through license
&/or permit)
Note: If poaching
is mentioned as a
problem then by
definition 1 or
more populations
must be
technically
protected from
"take" assign
a 2.

0=none protected/not adequate/
uncontrolled hunting/poaching
1=few populations
protected from "take" by
state and/or national legislation
2=moderate/some numbers of
populations protected from "take"
by state and/or national
legislation
3=most populations protected from
"take" by state and/or national
legislation
4=all populations protected from
"take" by state and/or national
legislation

LEGL

Protection from
other Acts
and/or Recognized
by IUCN
Note: All species
being reclassified
are currently
protected under
the ESA.

1=Listed IUCN endangered
2=Listed IUCN vulnerable
3=Listed CITES APP. I
4=Listed CITES APP. II
5=Listed IUCN E and CITES I
6=Listed IUCN V and CITES I
7=Listed IUCN E and CITES II
8=Listed IUCN V and CITES II
9=Listed MMPA
10=Listed IUCN, CITES & MMPA
11=No indicated protection
from other Acts
12=CITES and MMPA/MBTA
13=MBTA
14=MBTA and BGEPA
15=LACEY ACT

ACT

Effectiveness
of Protection
from "Take"
EFF
1=effective
2=ineffective
3=no protection

Current Level of
Habitat Protection
(protection by
state and/or
as LEGL above (substituting
"areas of habitat" for "numbers
of populations" and "degradation"

national and/or
private groups)
HPC

for "take"

Major Reason for
Habitat Loss
and/or Range Loss
HBLS

1=urbanization and development
2=slash and burn agriculture
3=logging (includes accessibility
into previously inaccessible
habitat via logging roads)
4=logging and slash and burn
agriculture (general defores-
tation)
5=agricultural development (other
than slash & burn)
6=hydroelectric dams
7=water diversion projects
8=filling and/or draining of
wetlands
9=transportation corridors
10=livestock grazing
11=human disturbance
12=military activity
13=pollution/siltation
14=mining/timber/agriculture
15=mining
16=mining &/or agriculture

Unique Habitat
UHB

1=Yes
2=No

Ecological
Association
with other
E/T species
ETA

1=Yes

Extinction
EXT

1=once thought to be extinct,
2=never thought to be extinct/
not mentioned in FR

Emergency Listing
EMR

1=has been emergency listed
2=has never received emergency
listing/not mentioned in FR

Nesting/Breeding
Success
SUCC

as GEN above

Primary Reason
Nesting/Spawning
Failure
FAIL

1=nest predation by native &/or
exotic species
2=eggshell thinning and/or
effects of pesticides/pollution

3=human disturbance (trampling of nests, separation of chicks from adults etc.)
 4=loss of nesting/spawning habitat
 5=human predation

Occupied	0=none
Tributaries	1=few
OTC	2=moderate
	3=numerous
	4=tributaries (no indication of #)

Special Rules	1=yes
allowing "take"	2=no or not mentioned in FR
TAKE	

NOTES for "rare use" variables (reported in less than 5% of the final listings considered).

Fecundity: The term "fecundity" appeared in 3 of the 272 listings examined. Two of these listings simply stated that fecundity was low. In the listing for the Northern spotted owl, the Service estimates fecundity as being 0.376. They then define fecundity as: the number of young fledged/female of age x. This author would have used a stricter definition of fecundity: the number of eggs produced per female (often assessed by corpora lutea counts). This is quite different from a measure of successful fledged young per female of age x.

Age-class data: The listing for the Sacramento river winter run of the Chinook salmon presented age-class data for various year classes. Other listings which mentioned age-classes simply presented a breakdown (either by percent or description) of juveniles versus adults. The listing for the Chihuahua chub did mention that chub of various ages had been found.

Declining physical fitness: Lower weights and smaller girths were reported for the Stellar sea lion and mean shorter carapace lengths for the desert tortoise.

Museum specimens and/or confirmed sightings: This variable gives a descriptive and/or numeric estimate for the number of museum specimens found and/or the number of confirmed sightings reported over decades. There is no measurement of effort for these values.

Individuals per trap effort: This variable gave a numeric value for the number of individuals trapped. This estimate

did incorporate some measurement of effort.

Basking and/or observation surveys: This variable gave a numeric and/or descriptive value for number of individuals encountered in an observational and/or basking survey. These surveys did not involve trapping. These surveys did incorporate measurements of survey effort.

APPENDIX H
DATABASE

RECORD#	USFR	ID	NEWID	GRP	NAME	FWS	RG	DATEI	DATEII	DATE	ET	ETGRP	HSTNMN	HNC	INDIVN	IC	HSDIS	CRDIS	POP
1	01	001	1	m	silverriceratlowerkeypop	01	02	12-Mar-80	30-Apr-91	91	e	M	-2	-2	-2	3	2	4	8
2	01	002	2	m	floridasaltmarshvole	02	01	18-Sep-85	14-Jan-91	91	e	M	-2	-2	-2	2	1	6	1
3	02	003	3	m	indusriverdolphin	03	01	01-Apr-87	11-Dec-90	90	e	S	-2	-2	500	-1	1	4	6
4	18	004	4	m	stellarsealion	03	01	21-Nov-89	05-Apr-90	90	t	s	290000	-1	66000	-1	1	1	-3
5	02	005	5	m	sichuansnubnosedmonkey	03	01	11-Nov-11	27-Sep-90	90	e	M	-2	-2	12500	3	1	3	-2
6	02	006	6	m	yunnansnubnosedmonkey	03	01	11-Nov-11	27-Sep-90	90	e	M	-2	-2	700	3	1	3	-2
7	02	007	7	m	guizhousnubnosedmonkey	03	01	11-Nov-11	27-Sep-90	90	e	M	-2	-2	435	3	1	3	-2
8	01	009	8	m	lowerkeysrabbit	02	01	17-Apr-85	21-Jun-90	90	e	M	-2	2	300	3	3	4	13
9	02	012	9	m	chineseriverdolphin	03	01	03-Dec-86	30-May-89	89	e	S	-2	-2	-2	-2	1	1	-2
10	01	013	10	m	anastasiaislandbeachmouse	02	01	11-Nov-11	12-May-89	89	e	M	-2	-2	-2	3	3	4	-2
11	16	014	11	m	southeasternbeachmouse	02	01	11-Nov-11	12-May-89	89	t	m	-2	3	-2	-2	3	4	5
12	02	015	12	m	mexicanlongnosedbat	03	01	30-Dec-82	30-Sep-88	88	e	M	-2	3	1600	-1	4	8	16
13	02	016	13	m	sanbornslongnosedbat	03	01	18-Sep-85	30-Sep-88	88	e	M	-2	3	15800	-1	4	8	6
14	01	017	14	m	stephenskangaroorat	03	01	30-Dec-82	30-Sep-88	88	e	M	-2	-2	-2	3	3	4	-2
15	02	018	15	m	visayandeer	03	01	11-Nov-11	01-Sep-88	88	e	M	-2	-2	-2	3	2	4	14
16	01	019	16	m	tiptonkangaroorat	02	01	18-Sep-85	08-Jul-88	88	e	M	-2	-2	-2	3	3	4	-2
17	01	020	17	m	hualapeivole	02	01	30-Dec-82	01-Oct-87	87	e	M	-2	-2	-2	2	3	4	4
18	01	021	18	m	mountrgrahamredsquirrel	02	01	30-Dec-82	03-Jun-87	87	e	M	-2	2	280	-1	2	6	16
19	01	022	19	m	giantkangaroorat	03	01	30-Dec-82	05-Jan-87	87	e	M	-2	3	-2	-2	3	4	-2
20	16	023	20	m	dismalswampssoutheasternshrew	02	01	30-Dec-82	26-Sep-86	86	t	m	-2	-2	-2	-2	2	6	-2
21	02	024	21	m	leadbetterpossum	03	01	11-Nov-11	16-May-86	86	e	M	-2	-2	-2	3	2	6	1
22	02	025	22	m	buffyтуftedearedmarmoset	02	01	11-Nov-11	16-May-86	86	e	M	-2	-2	-2	3	2	2	1
23	02	026	23	m	southernbeardedaki	02	01	11-Nov-11	16-May-86	86	e	M	-2	-2	-2	3	2	2	-2
24	02	027	24	m	largeearedhutia	03	01	11-Nov-11	16-May-86	86	e	M	-2	-2	-2	2	2	6	1
25	02	028	25	m	littleearthhutia	03	01	11-Nov-11	16-May-86	86	e	M	-2	-2	-2	1	2	6	1
26	02	029	26	m	dwarfhutia	03	01	11-Nov-11	16-May-86	86	e	M	-2	-2	-2	3	1	6	1
27	02	030	27	m	cabrerashtutia	03	01	11-Nov-11	16-May-86	86	e	M	-2	-2	-2	1	2	4	-2
28	02	031	28	m	baluchistanbear	02	01	11-Nov-11	16-May-86	86	e	M	-2	-2	200	3	1	6	1
29	03	032	29	m	guadalupefurseal	03	01	01-Jan-66	16-Dec-85	85	e	S	30000	-1	1600	3	1	3	1
30	01	033	30	m	carolinanorthernflyingsquirrel	02	01	30-Dec-82	01-Jul-85	85	e	M	-2	-2	-2	2	-2	4	8
31	01	034	31	m	virginianorthernflyingsquirrel	02	01	30-Dec-82	01-Jul-85	85	e	M	-2	-2	-2	2	-2	4	8
32	01	035	32	m	alabamabeachmouse	02	01	07-Jun-79	06-Jun-85	85	e	M	-2	-2	875	-1	3	4	-2
33	01	036	33	m	perdidokeybeachmouse	02	01	07-Jun-79	06-Jun-85	85	e	M	-2	-2	26	-1	3	6	1
34	01	037	34	m	choctawhatcheebeachmouse	02	01	09-Jun-82	06-Jun-85	85	e	M	-2	3	515	-1	3	4	3
35	01	038	35	m	fresnokangaroorat	02	01	30-Dec-82	30-Jan-85	85	e	M	-2	-2	-2	3	2	3	-2
36	02	039	36	m	cochito	03	01	05-Sep-78	09-Jan-85	85	e	S	-3	-3	-3	1	-3	6	1
37	01	040	37	m	amargosavole	02	01	18-Jun-80	15-Nov-84	84	e	M	-2	-2	-2	-2	2	6	-2
38	01	041	38	m	keylargowoodrat	02	01	19-May-80	31-Aug-84	84	e	M	-2	-2	739	3	3	3	2
39	01	042	39	m	keylargocottonmouse	02	01	19-May-80	31-Aug-84	84	e	M	-2	-2	-2	3	3	3	1
40	03	044	40	m	woodlandcariboupops	02	02	09-Feb-81	29-Feb-84	84	e	M	-2	3	30	3	1	3	1
41	02	045	41	m	rodriguesflyingfoxfruitbat	03	01	11-Nov-11	23-Jan-84	84	e	M	-2	-2	400	-1	2	6	1
42	02	046	42	m	bulmersflyingfoxfruitbat	03	01	11-Nov-11	23-Jan-84	84	e	M	-2	-2	-2	1	2	2	1
43	02	047	43	m	singaporeroundleafhorseseshoebat	03	01	11-Nov-11	23-Jan-84	84	e	M	-2	-2	50	-1	2	4	1
44	02	048	44	m	bumblebeebat	03	01	11-Nov-11	23-Jan-84	84	e	M	-2	-2	160	-1	2	2	-2
45	02	049	45	m	buffheadedmarmoset	03	01	11-Nov-11	23-Jan-84	84	e	M	-2	-2	-3	2	1	3	-2
46	02	050	46	m	preussredcolobusmonkey	02	01	11-Nov-11	23-Jan-84	84	e	M	-2	-2	8000	-1	1	6	-2
47	02	051	47	m	vancouverislandmarmot	03	01	11-Nov-11	23-Jan-84	84	e	M	-2	-2	125	-1	2	2	4
48	02	052	48	m	africanwilddog	03	01	11-Nov-11	23-Jan-84	84	e	M	-2	3	7000	-1	1	3	-2
49	02	053	49	m	pakistansandcat	02	01	11-Nov-11	23-Jan-84	84	e	M	-2	1	-2	3	2	2	-2
50	02	054	50	m	giantpanda	03	01	11-Nov-11	23-Jan-84	84	e	M	-2	-2	1000	-1	1	4	-2
51	01	055	51	m	ocelotuspop	01	01	11-Nov-11	21-Jul-82	82	e	M	-2	-2	36	3	1	3	1

RECORD#	POPC	ISOL	SMPOPN	SPC	LGPOPN	LPC	MDPOPN	MPC	TRDN	TC	RGLSN	RLC	EXRGL	HBSP	HBST	HBLSN	HLC	EXHBL	PRYSP	PRYST	CAT	IMPCT	HMPRD	IMPH	SPPRD
1	-1	2	-2	3	-2	5	-4	3	-2	-2	-2	34	4	1	4	-2	34	3	2	-2	-2	7	6	34	7
2	-1	6	-1	-1	-1	-1	-1	-1	97	3	-2	34	-2	1	5	-2	-2	-2	-2	-2	6	34	-1	-1	-1
3	-1	2	2	-1	429	-1	41	-1	-2	3	-2	34	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	34	34	-3
4	-3	1	3000	-1	53000	-1	5000	-1	63	5	-2	0	0	2	1	0	0	0	1	5	-2	-2	34	5	5
5	4	-2	-2	-2	-2	-2	-4	-4	-2	5	-2	34	-2	-2	-2	-2	34	4	-2	-2	-2	-2	34	6	0
6	4	-2	-2	-2	-2	-2	-4	-4	-2	5	-2	34	-2	-2	-2	-2	34	4	-2	-2	-2	-2	34	6	0
7	4	-2	-2	-2	-2	-2	-4	-4	-2	5	-2	34	-2	-2	-2	-2	34	4	-2	-2	-2	-2	34	6	0
8	-1	2	-2	3	-2	3	-4	3	-2	-2	-2	34	-2	1	4	-2	34	3	-2	-2	-2	-2	34	6	0
9	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	-2	-2	-2	34	-3	1	5	-2	-2	34	6	-2
10	4	2	-2	3	-2	3	-4	3	-2	-2	-2	34	3	1	4	-2	34	3	1	1	-2	-2	34	34	0
11	-1	2	-2	3	-2	5	-4	3	-2	-2	-2	34	3	1	4	-2	34	3	1	1	-2	-2	-1	-1	7
12	-1	2	1	-1	1000	-1	40	3	90	6	-2	-2	-2	1	4	-2	34	4	1	5	-2	-2	6	34	0
13	-1	2	1	-1	15000	-1	300	3	-2	6	-2	-2	-2	1	4	-2	34	4	1	5	-2	-2	6	34	-2
14	4	2	-2	3	-2	4	-4	3	-2	-2	-2	34	3	1	4	60	34	3	-2	-2	-2	34	-1	-1	-1
15	-1	2	-2	3	-2	-2	-4	3	-2	6	-2	34	4	-2	4	90	34	4	-2	-2	-2	-2	34	34	0
16	4	2	-2	3	-2	4	-4	3	-2	6	96	34	4	1	4	-2	34	4	1	-2	-2	34	-1	-1	5
17	-1	2	-2	2	-2	3	-4	3	-2	5	-2	-2	-2	1	4	-2	34	4	-2	5	6	34	0	34	7
18	-1	6	-2	3	-2	4	18	2	-2	3	-2	6	4	1	2	-2	34	4	1	5	-2	-2	6	5	6
19	4	2	-2	3	-2	4	-4	3	-2	6	60	34	4	1	4	80	34	4	1	-2	-2	34	-1	-1	6
20	-2	4	-2	-2	-2	-2	-4	-4	-2	-2	85	-1	-2	2	5	85	34	4	-2	-2	-2	-2	0	0	34
21	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	34	3	1	6	-2	34	4	-2	-2	-2	-2	0	0	0
22	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	1	4	-2	34	-2	-2	-2	-2	-2	0	0	0
23	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	3	1	-2	-2	34	4	-2	-2	-2	-2	6	-2	-2
24	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	1	5	-2	-2	-2	-2	-2	-2	-2	6	-2	-2
25	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	1	5	-2	-2	-2	-2	-2	-2	-2	6	-2	-2
26	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	34	4	1	5	-2	34	3	-2	-2	-2	-2	6	-2	-2
27	-1	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	1	4	-2	-2	-2	-2	-2	-2	-2	6	-2	-2
28	-1	4	-1	-1	-1	-1	-1	-1	-2	6	-2	34	-2	2	5	-2	34	-2	-2	-2	-2	-2	34	34	-2
29	-1	1	-1	-1	-1	-1	-1	-1	-2	7	-2	5	3	-2	-2	-2	5	3	-2	-2	-2	-2	34	6	-3
30	-1	2	-2	-2	-2	-2	-4	2	-2	3	-2	34	4	1	4	-2	34	3	-2	-2	-2	-2	0	34	0
31	-1	2	-2	-2	-2	-2	-4	2	-2	3	-2	34	4	1	4	-2	34	3	-2	-2	-2	-2	0	34	0
32	4	2	-2	-2	-2	-2	-4	3	-2	6	80	34	3	1	4	-2	34	3	-2	-2	-2	-2	0	34	0
33	-1	4	-1	-1	-1	-1	-1	-1	-2	6	80	34	3	1	5	-2	34	3	-2	-2	34	34	-1	-1	-2
34	-1	2	-2	-2	-2	-2	-4	3	-2	6	80	34	3	1	4	-2	34	3	-2	-2	34	34	-1	-1	-2
35	4	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	34	4	1	-2	94	34	3	1	-2	7	34	-1	-1	-2
36	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	5	-2	7	4	-3	5	-2	-2	34	34	-3
37	4	6	-2	-2	-2	-2	-4	3	-2	3	-2	-2	-2	1	6	-2	34	3	-2	-2	-2	-2	0	0	0
38	-1	6	85	-1	654	-1	-1	-1	-2	-2	-2	34	-2	1	4	-2	34	3	2	-2	-2	-2	-1	-1	-1
39	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	34	-2	1	4	-2	34	3	-2	-2	-2	-2	-1	-1	-1
40	-1	6	-1	-1	-1	-1	-1	-1	70	3	-2	34	-2	2	5	-2	34	3	1	6	34	-2	34	34	6
41	-1	4	-1	-1	-1	-1	-1	-1	88	3	98	-1	-1	1	5	98	34	-2	1	5	34	-2	34	34	-1
42	-1	-3	-1	-1	-1	-1	-1	-1	-2	3	-1	-1	-1	-2	-2	-2	-1	-1	-2	-2	-1	-1	34	34	-1
43	-1	2	-1	-1	-1	-1	-1	-1	-2	3	-2	34	-2	1	4	-2	34	-2	-2	-2	-1	-1	-1	-1	-1
44	4	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	1	7	-2	34	-2	-2	-2	-1	-1	-1	-1	-1
45	4	5	-2	-2	-2	-2	-4	-4	-2	3	-2	34	-2	-2	4	-2	34	3	-2	-2	-1	-1	34	8	-1
46	-1	4	-2	1	-2	-2	-4	-4	-2	3	-2	34	-2	1	6	-2	34	3	-2	-2	-1	-1	34	34	-1
47	-1	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	6	4	1	6	-2	34	3	-2	-2	-1	-1	34	34	-1
48	4	-2	-2	1	-2	-2	-4	-4	-2	3	-1	34	-1	-2	-2	-2	-1	-1	-2	-1	-1	-1	34	34	-1
49	-2	-2	-2	-2	-2	-2	-4	-4	-2	6	-1	-1	-1	-2	5	-2	-1	-1	-2	-1	-1	-1	34	34	-1
50	4	2	-2	3	-2	3	-4	3	-2	3	-2	34	3	1	4	-2	34	3	1	4	34	-1	-1	-1	-1
51	-1	-2	-1	-1	-1	-1	-1	-1	-2	3	-2	34	4	1	7	-2	34	4	-2	-2	-2	-2	34	6	-2

RECORD#	IMPS	EXOT	IMPE	POLL	IMPP	DIS	IMPD	GEN	DEM	LTRN	LTRC	INMRT	IMC	PRSN	PC	LEGL	ACT	EFF	HBPRN	HPC	HBL5	UHB	ETA	NME	EXT	EMR	ACTNSN	SUCN	SUCC
1	6	6	6	-2	-2	-2	-2	6	-2	-2	-2	-2	-2	-2	-2	4	11	1	0	0	1	1	-2	-2	2	2	0	0	0
2	-1	-1	-1	-2	-2	-1	-1	7	7	-2	-2	-2	-2	-2	-2	-3	11	-2	-2	-2	-2	1	-2	-2	2	2	0	0	0
3	-3	-3	-3	0	0	-3	-3	-2	-2	-2	-2	-2	-2	-2	35	-1	1	5	2	-2	-2	67	-2	-2	2	2	0	0	0
4	34	-2	-2	-2	-2	7	5	-2	-2	-2	-2	-2	-2	-2	-2	4	9	-2	-2	-2	-2	-2	-2	2	1	0	0	0	
5	34	-2	-2	-2	-2	0	34	-2	-2	-2	-2	-2	-2	-2	-2	2	6	2	-2	0	2	-2	1	1	2	2	0	0	0
6	34	-2	-2	-2	-2	0	34	-2	-2	-2	-2	-2	-2	-2	-2	2	5	2	-2	0	2	-2	1	1	2	2	0	0	0
7	34	-2	-2	-2	-2	0	34	-2	-2	-2	-2	-2	-2	-2	-2	2	5	2	-2	0	2	-2	-2	-2	2	2	0	0	0
8	-2	6	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	46	-1	8	1	1	1	2	2	0	0	0
9	0	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	35	-1	-3	11	-3	-3	67	-2	-2	-2	2	2	0	0	0
10	34	7	34	-2	-2	-2	-2	7	-2	4	-2	80	-1	-2	-2	0	11	3	0	0	1	1	-2	-2	2	2	0	0	0
11	0	7	34	-2	-2	-2	-2	-2	-2	4	-2	80	-1	-2	-2	0	11	3	0	0	1	1	-2	-2	2	2	0	0	0
12	-2	-2	-2	-2	-2	6	34	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	1	11	1	-2	-2	2	2	0	0	0
13	-2	-2	-2	-2	-2	6	34	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	1	11	1	-2	-2	2	2	0	0	0
14	-1	-1	6	7	-2	-1	-1	7	7	-2	-2	-2	-2	-2	-2	4	11	1	6	1	1	1	-2	-2	2	2	0	0	0
15	0	0	0	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	2	4	-2	-2	2	2	0	0	0	0
16	34	-2	-2	-2	34	5	34	7	7	-2	-2	-2	-2	-2	-2	-2	11	2	10	-1	5	1	1	1	2	2	0	0	0
17	7	7	7	-2	-2	-3	-3	7	-2	-2	7	-2	-2	-2	-2	0	11	2	-2	-2	10	1	-2	-2	2	2	0	0	0
18	5	7	34	-2	-2	-3	-3	7	7	-2	7	-2	-2	-2	-2	4	11	1	0	0	3	2	-2	-2	1	2	0	0	0
19	34	-2	-2	-2	34	7	34	7	-2	-2	-2	-2	-2	-2	-2	4	11	3	-2	-2	5	1	-2	-2	2	2	0	0	0
20	34	-2	-2	-2	-2	0	0	6	-2	-2	-2	-2	-2	-2	-2	3	11	1	-2	-2	67	1	-2	-2	2	2	0	0	0
21	0	-2	-2	-2	-2	0	0	7	-2	-2	-2	-2	-2	-2	-2	4	1	-2	-2	2	4	1	-2	-2	1	2	0	0	0
22	0	-2	-2	-2	-2	6	34	7	-2	-2	-2	-2	-2	-2	-2	1	1	-2	-2	1	1	1	-2	-2	2	2	0	0	0
23	-2	-2	-2	-2	-2	0	0	7	-2	-2	-2	-2	-2	-2	-2	1	1	-2	-2	1	-2	1	-2	-2	2	2	0	0	0
24	-2	-2	-2	-2	-2	0	0	7	-2	-2	-2	-2	-2	-2	-2	4	1	2	-2	-2	-2	1	-2	-2	2	2	0	0	0
25	-2	-2	-2	-2	-2	0	0	7	-2	-2	-2	-2	-2	-2	-2	4	1	2	-2	-2	-2	1	-2	-2	2	2	0	0	0
26	-2	-2	-2	-2	-2	0	0	7	-2	-2	-2	-2	-2	-2	-2	4	1	2	-2	-2	5	1	-2	-2	2	2	0	0	0
27	-2	-2	-2	-2	-2	0	0	7	-2	-2	-2	-2	-2	-2	-2	4	1	2	-2	-2	-2	1	-2	-2	2	2	0	0	0
28	-2	-2	-2	-2	-2	0	0	7	-2	-2	-2	-2	-2	-2	-2	0	1	3	-2	-2	-2	1	-2	-2	2	2	0	0	0
29	-3	-2	-2	-2	-2	-3	-3	7	-2	1	7	-2	-2	-2	-2	4	10	1	-2	-2	-1	2	-2	-2	1	2	0	0	0
30	0	34	34	-2	-2	7	34	-2	-2	-2	7	-2	-2	-2	-2	4	-1	-2	-2	-2	3	1	-2	-2	2	2	0	0	0
31	0	34	34	-2	-2	7	34	-2	-2	-2	7	-2	-2	-2	-2	4	-1	-2	-2	-2	3	1	-2	-2	2	2	0	0	0
32	-2	7	34	-2	-2	-2	-2	7	-2	-2	-2	-2	-2	-2	-2	0	11	3	0	0	1	1	-2	-2	2	2	0	0	0
33	-2	7	34	-2	-2	-2	-2	7	-2	-2	-2	-2	-2	-2	-2	0	11	3	0	0	1	1	1	-2	2	2	0	0	0
34	-2	7	34	-2	-2	-2	-2	7	-2	-2	-2	-2	-2	-2	-2	0	11	3	0	0	1	1	1	-2	2	2	0	0	0
35	34	-1	-1	-2	-2	0	34	-2	-2	-2	-2	-2	-2	-2	-2	4	11	1	-2	-2	5	1	-2	-2	1	2	0	0	0
36	-3	-2	-2	-2	-3	-3	-3	-3	-2	-2	-2	-2	-2	-2	-2	-2	10	2	-2	-2	67	-3	-2	-2	2	2	0	0	0
37	0	7	34	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	1	-2	1	8	1	1	-3	1	2	0	0	0
38	-1	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	1	1	1	1	10	2	1	0	0	0
39	-1	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	1	1	1	1	10	2	1	0	0	0
40	5	-2	-2	-2	-2	5	0	3	-2	-2	-2	-2	-2	3	-2	1	4	11	2	-2	-2	3	2	-2	2	1	0	0	0
41	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	0	0	-2	1	-2	-2	2	2	0	0	0
42	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-2	-2	-2	-2	-2	-2	2	2	0	0	0
43	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-2	-2	3	1	-2	-2	2	2	0	0	0
44	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	-1	-2	-2	-2	3	1	-2	-2	2	2	0	0	0
45	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	-2	-2	-2	-2	2	2	0	0	0	0
46	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	-2	3	1	-2	-2	2	2	0	0	0
47	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-2	-2	-2	1	1	-2	-2	2	2	0	0	0
48	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	1	11	-2	-2	-2	-2	-2	-2	2	2	0	0	0	0
49	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	4	-2	-2	-2	-2	-2	-2	2	2	0	0	0	0
50	-1	-2	-2	-1	-1	-1	-1	-2	-2	-2	1	-2	-2	-2	-2	3	11	-2	-2	3	-2	1	-2	-2	2	2	0	0	0
51	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	11	-2	40	-1	5	1	-2	-2	2	2	0	0	0

RECORD#	FAIL	MAT	OCDR	OCTR	OTC	POPLS	TAKE
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0

RECORD#	USFR	ID	NEWID	GRP	NAME	FWS	RG	DATEI	DATEI1	DATE	ET	ETGRP	HSTNMN	HNC	INDIVN	IC	HSDIS	CRDIS	POP
52	02	058	52	m	blackrhinoceros	03	01	11-Aug-77	14-Jul-80	80	e	M	-2	-2	15000	-1	1	3	-2
53	01	059	53	m	virginiabigearredbat	02	01	15-Oct-76	30-Nov-79	79	e	M	-2	-2	3500	-1	2	2	3
54	01	060	54	m	ozarkbigearredbat	02	01	15-Oct-76	30-Nov-79	79	e	M	-2	-2	100	-1	2	2	1
55	17	061	55	m	grevyszebra	03	01	11-Nov-11	21-Aug-79	79	t	m	-2	-2	13718	-1	1	3	-2
56	17	062	56	m	hartmannsmountainzebra	02	01	11-Nov-11	21-Aug-79	79	t	m	62500	-1	7000	.2	1	3	-2
57	17	063	57	m	westafricanmanatee	03	01	18-Nov-77	20-Jul-79	79	t	s	-3	-3	-3	-3	1	1	-3
58	02	064	58	m	ryukyurabbit	03	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	700	-1	3	2	-2
59	02	065	59	m	simienfox	03	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	462	-1	3	5	-2
60	02	066	60	m	malabarlargespottedcivet	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	1	3	5	-2
61	02	067	61	m	iriomotecat	03	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	350	-1	3	5	-2
62	02	068	62	m	feasmuntjac	03	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	-2	1	2	-2
63	02	069	63	m	formosansika	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	0	-1	3	13	-2
64	02	070	64	m	ryukyusika	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	30	-1	3	6	1
65	02	071	65	m	northchinasika	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	-2	1	3	-2
66	02	072	66	m	shansisika	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-3	1	1	-3	-2
67	02	073	67	m	southchinasika	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	1	1	-3	-2
68	02	074	68	m	corsicanreddeer	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	300	-1	3	4	-2
69	02	075	69	m	barbarydeer	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	400	-1	1	6	1
70	02	076	70	m	yarkanddeer	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	1	1	3	-2
71	02	077	71	m	bactriandeer	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	500	-1	1	3	-2
72	02	078	72	m	westerngianteland	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	180	-1	1	2	3
73	02	079	73	m	jentinksdruiker	03	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	300	-1	1	3	-2
74	02	080	74	m	torahartebeest	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	250	-1	1	1	-2
75	02	081	75	m	swayneshartebeest	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	700	-1	1	4	4
76	02	082	76	m	zanzibarsuni	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	1	3	3	-2
77	02	083	77	m	sandgazelle	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	-2	1	3	-2
78	02	084	78	m	saudiarabiangazelle	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	500	-1	1	2	-2
79	02	085	79	m	pelzelns gazelle	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	-2	1	3	-2
80	02	086	80	m	arabiangazelle	02	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	-2	1	3	-2
81	02	087	81	m	arabiantahr	03	01	11-Nov-11	25-Jun-79	79	e	M	-2	-2	-2	-2	1	4	-2
82	03	088	82	m	caribbeanmonkseal	03	01	11-Nov-11	10-Apr-79	79	e	S	-2	-2	-2	1	1	-3	-3
83	17	089	83	m	africanelephant	03	01	01-Jan-73	12-May-78	78	t	m	-2	-2	1300000	-1	1	3	-2
84	03	091	84	m	graywolfmexicoandunitedstates	03	01	11-Nov-11	09-Mar-78	78	e	M	-2	-2	200	2	1	3	4
85	18	092	85	m	southernseaotter	02	01	22-May-75	14-Jan-77	77	t	s	16000	-2	1500	-1	1	3	1
86	01	093	86	m	hawaiianmonkseal	03	01	11-Nov-11	22-Nov-76	76	e	S	-2	-2	-2	3	3	3	-2
87	02	094	87	m	cottontopmaromset	04	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	2	2	-2
88	02	095	88	m	pieltamarin	03	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	3	3	-2
89	02	096	89	m	yellowtailedwoollymonkey	03	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	3	2	-2
90	02	097	90	m	dianamonkey	04	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	1	3	-2
91	02	098	91	m	redearednosespottedmonkey	03	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	2	2	-2
92	02	099	92	m	redbelliedmonkey	03	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	1	2	2	-2
93	02	100	93	m	lhoestsmonkey	04	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	1	4	2
94	02	101	94	m	whitecollaredmangabey	04	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	1	4	-2
95	02	102	95	m	blackcolobus	03	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	1	1	-2
96	02	103	96	m	mandrill	03	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	1	3	-2
97	02	104	97	m	drill	03	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	-2	-2	3	-2
98	02	105	98	m	francoisleafmonkey	03	01	01-Jan-73	19-Oct-76	76	e	M	-2	-2	-2	1	-2	2	-2
99	17	106	99	m	lesserslowloris	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	2	2	-2
100	17	107	100	m	philippinetarsier	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	2	2	-2
101	17	108	101	m	whitefootedtamarin	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	2	4	-2
102	17	109	102	m	blackhowlermonkey	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	1	-2	-2

RECORD#	POPC	ISOL	SMPOP	SPC	LGPOP	LPC	MDPOP	MPC	TRDN	TC	RGLSN	RLC	EXRGL	HBSP	HBST	HBLSN	HLC	EXHBL	PRYSP	PRYST	CAT	IMPCT	HMPRD	IMPH	SPPRD
52	4	-2	7	-1	-2	-2	-4	-4	95	5	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
53	-1	2	500	-1	2500	-1	-4	-4	-2	6	-2	-2	-2	1	4	-2	34	3	-2	-2	-2	-2	6	-2	-1
54	-1	2	-1	-1	-1	-1	-1	-1	-2	6	-2	-2	-2	1	4	-2	34	3	-2	-2	-2	-2	6	-2	-1
55	-2	-2	-2	-2	-2	-2	-4	-4	65	5	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	-2	-2
56	-2	-2	-2	-2	-2	-2	-4	-4	-2	1	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
57	-3	-3	-3	-3	-3	-3	-4	-4	-2	3	0	0	0	-2	-2	-2	6	3	-2	-2	-2	-2	34	34	-2
58	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	7	-2	34	3	-2	-2	-2	-2	-2	-2	34
59	-1	2	50	-1	412	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
60	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	34	34	-2
61	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
62	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
63	-2	-2	-2	-2	-2	-2	-4	-4	99	3	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
64	-1	4	-1	-1	-1	-1	-1	-1	90	3	-2	34	-2	-2	8	-2	-2	-2	1	7	34	34	34	34	-2
65	4	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	34	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	34	34	-2
66	4	2	-3	-3	-3	-3	-4	-4	-2	3	-3	-3	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	34	34	-2
67	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
68	3	2	-2	-2	-2	-2	-4	-4	-2	-2	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
69	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	34	-2	-2	5	-2	34	-2	-2	-2	-2	-2	34	34	-2
70	-2	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	34	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
71	4	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	6	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
72	-1	-2	30	-1	100	-1	50	-1	-2	3	-2	34	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	34	34	-2
73	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	34	-2	-2	-2	-2	34	-3	-2	-2	-2	-2	34	34	-2
74	-2	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	5	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
75	-1	2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
76	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	34	-2	-2
77	-2	-2	-2	-2	-2	4	-4	-4	-2	6	-2	34	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	34	-2	34
78	-2	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
79	-2	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	-2	5	-2	34	3	-2	-2	-2	-2	34	34	-2
80	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	34	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
81	4	2	-2	-2	-2	-2	-4	-4	-2	-2	-2	6	-2	1	4	-2	34	3	-2	-2	-2	-2	34	34	-2
82	-3	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	34	-2	5
83	4	3	-2	3	-2	5	-4	-4	-2	5	-2	34	3	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	5
84	4	3	-2	-2	-2	-2	-4	-4	-2	-2	-2	34	-2	2	4	-2	34	-2	1	5	-2	-2	34	34	-1
85	-1	1	-1	-1	-1	-1	-1	-1	-2	-2	90	34	-2	-2	-2	-2	6	4	-2	-2	-2	-2	34	5	5
86	4	1	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	1	8	-2	34	-2	-2	-2	-2	-2	-1	-1	34
87	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	-2	-2
88	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	2	3	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
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90	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	6	-2	1	-2	-2	34	3	-2	-2	-2	-2	6	6	-2
91	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	1	7	-2	34	3	-2	-2	-2	-2	34	34	-2
92	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
93	-2	2	-2	-2	-2	-2	-1	-1	-2	3	-2	-2	-2	1	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
94	4	2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	1	7	82	-2	3	-2	-2	-2	-2	34	34	-2
95	4	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	1	-2	-2	34	3	-2	-2	-2	-2	34	34	-2
96	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	34	-2	1	7	-2	34	3	-2	-2	-2	-2	34	34	-2
97	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	34	-2	2	7	-2	34	3	-2	-2	-2	-2	34	34	-2
98	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	-2	-2	-2
99	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	7	-2	34	-2	-2	-2	-2	-2	-2	-2	-2
100	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	-2	-2	-2
101	4	2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	4	-2	34	3	-2	-2	-2	-2	-2	-2	-2
102	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	6	4	-2	-2	-2	-2	-2	-2	34

RECORD#	IMPS	EXOT	IMPE	POLL	IMPP	DIS	IMPD	GEN	DEM	LTRN	LTRC	INMRT	IMC	PRSN	PC	LEGL	ACT	EFF	HBPRN	HPC	HBL5	UHB	ETA	NME	EXT	EMR	ACTNSN	SUCN	SUCC	
52	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	-2	-2	10	-1	4	3	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
53	-1	-2	-2	-2	-2	-1	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	-2	-2	11	1	-2	-2	2	2	0	0	0
54	-1	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	-2	-2	11	1	-2	-2	2	2	0	0	0
55	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	3	-2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
56	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	3	4	-2	-2	2	2	-2	-2	-2	-2	2	2	0	0	0
57	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	10	2	-2	2	2	67	-2	-2	-2	2	2	0	0	0
58	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	1	-2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
59	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	1	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
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61	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	1	2	-2	-2	-2	5	-2	-2	-2	2	2	0	0	0
62	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	1	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
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66	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	1	3	-2	-2	-2	5	-2	-2	-2	1	2	0	0	0
67	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	1	3	-2	-2	-2	-2	-2	-2	1	2	0	0	0	
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75	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	1	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
76	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	1	3	-2	-2	-2	-2	-2	-2	1	2	0	0	0	
77	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	1	3	-2	-2	-2	10	-2	-2	-2	2	2	0	0	0
78	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	1	3	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
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81	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	1	3	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
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83	5	-2	-2	-2	-2	5	5	-2	-2	-2	-2	-2	-2	-2	-2	2	4	2	-2	-2	-2	5	-2	-2	-2	2	2	0	0	0
84	-1	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	3	11	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
85	5	-2	-2	-2	-2	7	5	-2	-2	-2	-2	-2	-2	-2	-2	4	12	1	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
86	34	34	8	-2	-2	5	5	-2	-2	-2	1	-2	-2	3	-2	4	9	1	-2	-2	-2	11	-2	-2	-2	2	2	0	0	0
87	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	11	-2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
88	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	-2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
89	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	11	-2	-2	-2	-2	-2	-2	-2	2	2	0	0	0	
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91	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	2	1	-2	-2	2	2	0	0	0
92	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	4	1	-2	-2	2	2	0	0	0
93	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	3	1	-2	-2	2	2	0	0	0
94	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	3	1	-2	-2	2	2	0	0	0
95	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	3	1	-2	-2	2	2	0	0	0
96	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	11	-2	-2	-2	-2	4	1	-2	-2	2	2	0	0	0
97	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	4	1	-2	-2	2	2	0	0	0
98	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	12	-2	-2	-2	1	2	0	0	0
99	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	12	-2	-2	-2	2	2	0	0	0
100	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	4	-2	-2	-2	2	2	0	0	0
101	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	-2	4	-2	-2	-2	2	2	0	0	0
102	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	11	-2	-2	-2	-2	4	-2	-2	-2	2	2	0	0	0

RECORD#	FAIL	MAT	OCDR	OCTRN	OTC	POPLS	TAKE
52	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0

RECORD#	USFR	ID	NEWID	GRP	NAME	FWS	RG	DATEI	DATEII	DATE	ET	ETGRP	HSTNMN	HNC	INDIVN	IC	HSDIS	CRDIS	POP
103	17	110	103	m	stumptailmacaque	04	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	1	-2	-2
104	17	111	104	m	geladababoon	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	2	-2	-2
105	17	112	105	m	formosanrockmacaque	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	2	-4	-2
106	17	113	106	m	japanesemacaque	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	3	4	-2
107	17	114	107	m	toquemacaque	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	2	2	-2
108	17	115	108	m	longtailedlangur	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	3	2	2	-2
109	17	116	109	m	purplefacedlangur	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	2	2	-2
110	17	117	110	m	tonkinsnubnosedmonkey	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	2	2	-2
111	17	118	111	m	pygmychimpanzee	03	01	01-Jan-73	19-Oct-76	76	t	m	-3	-3	-3	3	3	3	-3
112	17	119	112	m	chimpanzee	03	01	01-Jan-73	19-Oct-76	76	t	m	-2	-2	-2	-2	-2	-2	-2
113	01	120	113	m	graybat	03	01	11-Nov-11	28-Apr-76	76	e	M	-2	-2	-2	3	1	3	5
114	03	121	114	m	mexicanwolf	02	01	11-Nov-11	28-Apr-76	76	e	M	-2	2	200	3	1	3	-2
115	01	122	115	m	cedrosislandmuledeer	02	01	11-Nov-11	24-Sep-75	75	e	M	-2	-2	12	-1	3	6	1
116	01	123	116	m	peninsularpronghornantelope	02	01	11-Nov-11	24-Sep-75	75	e	M	-2	-2	-2	3	3	4	2
117	01	124	117	m	grizzlybearlowerfortyeight	02	02	14-Feb-74	28-Jul-75	75	t	m	-2	-2	-3	-3	1	4	3
118	01	125	118	m	littlemarianafruitbat	03	01	28-Aug-78	27-Aug-84	84	e	M	-2	-2	100	2	3	6	1
119	01	126	119	m	marianafruitbat	02	02	28-Aug-78	27-Aug-84	84	e	M	-2	-2	500	-1	3	2	1
120	06	127	120	b	whiteneckedcrow	03	01	25-Jul-86	03-Apr-91	91	e	B	-2	2	-2	3	2	4	2
121	04	128	121	b	goldencheekedwarbler	03	01	30-Dec-82	27-Dec-90	90	e	B	-2	-2	16000	-1	3	10	-2
122	05	130	122	b	northernbaldibis	03	01	24-Nov-80	28-Sep-90	90	e	B	-3	3	180	-1	1	3	13
123	05	131	123	b	whitewingedguan	03	01	24-Nov-80	28-Sep-90	90	e	B	-2	2	300	-1	3	2	1
124	05	132	124	b	cheerpheasant	03	01	24-Nov-80	28-Sep-90	90	e	B	-2	-2	-2	2	2	3	-2
125	05	133	125	b	redtailedparrot	03	01	24-Nov-80	28-Sep-90	90	e	B	-2	-2	4000	-1	2	2	1
126	05	134	126	b	norfolkislandparakeet	02	01	24-Nov-80	28-Sep-90	90	e	B	-2	2	30	-1	3	2	-2
127	05	135	127	b	madagascarredowl	03	01	24-Nov-80	28-Sep-90	90	e	B	-2	-2	-2	1	2	2	-2
128	19	136	128	b	northernspottedowl	02	01	28-Jan-87	26-Jun-90	90	t	b	-3	-3	4000	-1	1	3	-2
129	04	137	129	b	roseateaternnortheastuspop	01	02	30-Dec-82	02-Nov-87	87	e	B	17000	-1	5742	3	4	8	17
130	21	138	130	b	roseateaterncaribbeanpop	01	02	30-Dec-82	02-Nov-87	87	t	b	-2	-2	8152	4	4	9	-2
131	04	139	131	b	blackcappedvireo	03	01	30-Dec-82	06-Oct-87	87	e	B	-2	-2	341	-1	4	9	-2
132	19	140	132	b	inyobrowntowhee	02	01	30-Dec-82	03-Aug-87	87	t	b	-2	-2	159	-1	2	2	1
133	19	141	133	b	audubonscrestedcaraccraflapop	01	02	11-Nov-11	06-Jul-87	87	t	b	-2	2	400	-1	1	3	1
134	19	142	134	b	floridascrubjay	02	01	16-Mar-84	03-Jun-87	87	t	b	37000	-1	18500	-1	2	3	-2
135	04	144	135	b	floridagrasshoppersparrow	02	01	11-Nov-11	31-Jul-86	86	e	B	-2	3	250	-1	3	3	9
136	06	145	136	b	leastbellsivireo	02	01	08-Nov-79	02-May-86	86	e	B	-2	3	582	3	4	10	46
137	06	146	137	b	northernaplomadofalcon	02	01	01-Jan-73	25-Feb-86	86	e	B	-2	-2	-2	-2	1	3	-2
138	06	147	138	b	pipinplovergreatlakespop	01	02	30-Dec-82	11-Dec-85	85	e	B	-3	2	34	-1	4	9	4
139	21	148	139	b	pipinplovernorthgreatplains	01	02	30-Dec-82	11-Dec-85	85	t	b	-3	2	2878	3	4	9	10
140	04	149	140	b	leastterninteriorpop	01	02	01-Jan-75	28-May-85	85	e	B	-3	2	1680	3	4	9	15
141	04	150	141	b	guambroadbill	03	01	27-Feb-79	27-Aug-84	84	e	B	-2	-2	100	2	3	6	1
142	04	151	142	b	marianacrow	03	01	27-Feb-79	27-Aug-84	84	e	B	-2	-2	1475	-1	3	5	2
143	04	152	143	b	marianagallinule	02	01	28-Aug-78	27-Aug-84	84	e	B	-2	-2	200	-1	3	3	4
144	04	153	144	b	micronesiankingfisher	02	01	27-Feb-79	27-Aug-84	84	e	B	-2	2	3000	-1	3	3	-2
145	04	154	145	b	guamrail	03	01	28-Aug-78	27-Aug-84	84	e	B	-2	-2	100	2	3	4	-2
146	04	155	146	b	vanikoroswiftlet	02	01	28-Aug-78	27-Aug-84	84	e	B	-2	-2	-2	-2	3	3	3
147	04	156	147	b	bridledwhiteeye	02	01	27-Feb-78	27-Aug-84	84	e	B	-2	-2	50	2	3	6	1
148	04	158	148	b	woodstorkbreedingpopus	01	02	16-Feb-82	28-Feb-84	84	e	B	40000	-1	10000	-1	-2	4	9
149	19	159	149	b	baldeaglepopswaorwimmi	01	02	11-Nov-11	14-Feb-78	78	t	b	-2	2	964	-1	4	7	-2
150	04	160	150	b	baldeagleallremainingpops	01	02	11-Nov-11	14-Feb-78	78	e	B	-2	2	614	-1	4	7	-2
151	04	161	151	b	sanclementelloggerheadshrike	02	01	11-Nov-11	11-Aug-77	77	e	B	-2	-2	50	-1	3	6	1
152	19	162	152	b	sanclementesagesparrow	02	01	11-Nov-11	11-Aug-77	77	t	b	-2	-2	600	-1	3	6	1
153	04	163	153	b	marianasmallard	03	01	28-May-75	02-Jun-77	77	e	B	-2	-2	14	2	3	6	1

RECORD#	POPC	ISOL	SMPOPN	SPC	LGPOPN	LPC	MDPOPN	MPC	TRDN	TC	RGLSN	RLC	EXRGL	HBSP	HBST	HBLSN	HLC	EXHBL	PRYSP	PRYST	CAT	IMPCT	HMPRD	IMPH	SPPRD
103	-2	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	6	4	-2	-2	-2	-2	34	34	-2
104	4	-2	-2	-2	-2	-2	-2	-4	-4	-2	5	-2	-2	-2	-2	8	-2	34	3	-2	-2	-2	34	34	-2
105	4	2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	6	-2	-2	4	-2	34	-2	-2	-2	-2	34	34	-2
106	4	2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	1	-2	-2	34	3	-2	-2	-2	-2	-2	-2
107	-2	5	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	4	-2	-2	34	3	-2	-2	-2	-2	-2	-2
108	-2	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	1	-2	-2	6	4	-2	-2	-2	34	34	-2
109	-2	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	1	-2	-2	34	3	1	-2	-2	-2	-2	-2
110	-2	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	-2	-2
111	-3	-2	-3	-3	-3	-3	-3	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	-2	-2
112	-2	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	34	34	-2
113	-2	-2	-2	-2	-2	-2	5	-4	-4	-2	6	-2	-2	-2	1	4	-2	34	3	-2	-2	-2	34	34	-2
114	4	-2	-2	-2	-2	-2	-2	-4	-4	-2	5	-2	34	-2	-2	-2	-2	34	3	-2	-2	-2	34	34	5
115	-2	4	-1	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	-2	6	-2	-2	-2	-2	-2	-2	34	34	-2
116	-1	2	-2	-2	-2	-2	-2	-1	-1	-2	3	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-1
117	-1	2	-3	-3	-3	-3	-3	-4	-4	-3	-3	-2	34	-2	-2	-3	-2	-2	-2	-2	-2	-2	34	34	-1
118	-2	4	-1	-1	-1	-1	-1	-1	-1	-2	6	-2	34	-2	-2	7	-2	34	-2	-2	-2	-2	34	34	-2
119	-2	-2	-1	-1	-1	-1	-1	-1	-1	-2	6	-2	34	-2	-2	-2	-2	34	-2	-2	-2	-2	34	34	-2
120	-1	2	-2	-2	-2	-2	5	-1	-1	-2	6	-2	34	3	1	7	85	-1	3	-2	-2	-2	34	6	5
121	4	3	-2	-2	-2	-2	-2	-4	-4	70	3	-2	34	3	1	4	50	34	-4	-2	-2	6	6	0	8
122	-1	-2	30	-1	-2	-2	-2	-4	-4	91	6	-2	6	4	2	4	-2	34	4	-2	-2	34	34	34	34
123	-2	-2	-1	-1	-1	-1	-1	-1	-1	-2	5	-2	-2	-2	2	-2	-2	34	3	-2	-2	-2	34	34	-2
124	4	5	18	2	18	2	18	2	2	-2	3	0	0	-2	2	-2	-2	34	4	-2	-2	-2	34	34	-2
125	-1	-2	-1	-1	-1	-1	-1	-1	-1	-2	5	-2	-2	-2	1	-2	-2	34	3	-2	-2	-2	34	34	-2
126	-2	-2	-2	-2	-2	-2	-2	-4	-4	-2	5	-2	-2	-2	1	-2	-2	34	4	-2	-2	-2	-2	-2	-2
127	-2	-2	-2	-2	-2	-2	-2	-4	-4	-2	5	-2	-2	-2	1	-2	-2	34	4	-2	-2	-2	-2	-2	-2
128	4	3	-2	3	-2	-2	-2	-4	-4	90	6	0	0	1	1	4	60	34	3	1	8	34	34	6	34
129	-1	5	6	-1	3445	-1	-4	-4	66	6	-2	-2	-2	-2	1	8	-2	34	3	1	1	-2	34	-2	34
130	4	5	72	-1	-2	-2	-2	-4	-4	-3	6	-2	-2	-2	1	8	-2	34	3	1	1	-2	34	34	34
131	4	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	34	-2	1	-2	-2	34	3	2	-2	34	34	34	34
132	-1	6	-1	-1	-1	-1	-1	-1	-1	-3	-3	-2	-2	-2	1	4	-2	34	4	2	-2	-2	0	0	-1
133	-1	6	-1	-1	-1	-1	-1	-1	-1	-2	6	-2	34	4	1	4	3	34	3	2	-2	-2	34	6	-1
134	4	6	-2	3	-2	-2	-2	-4	-4	50	3	-2	-2	-2	1	4	40	34	3	2	-2	-2	34	34	0
135	-1	6	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	34	-2	1	-2	-2	34	3	-2	-2	-2	0	34	6
136	-1	2	8	-1	170	-1	10	-1	70	6	-2	34	-2	1	4	95	34	3	2	-2	-2	-2	-2	-2	34
137	4	-2	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	34	-2	1	7	-2	34	-2	2	-2	-2	34	5	0
138	4	-2	2	-1	26	-1	4	-1	97	5	-2	34	-2	1	7	-2	34	3	-2	-2	-2	-2	34	34	34
139	4	-2	2	-2	1424	-1	94	-1	80	5	-2	34	3	1	7	55	34	3	-2	-2	-2	-2	34	34	34
140	4	-2	10	-1	400	-1	100	-1	-3	-3	-2	34	-2	1	7	-2	34	3	1	-2	-2	-2	1	1	34
141	-1	4	-1	-1	-1	-1	-1	-1	-1	-2	3	66	34	-2	1	5	-2	34	1	-2	-2	-2	5	8	-1
142	-1	3	175	-1	1300	-1	-1	-1	-2	3	-2	34	-2	2	-2	-2	-2	34	1	2	-2	-2	6	7	-1
143	-1	5	-2	3	150	-1	-4	3	-2	3	-2	34	-2	1	4	-2	-2	34	1	-2	-2	-2	5	8	-1
144	-2	4	-2	-2	-2	-2	-2	-4	-4	-2	3	75	34	-2	1	-2	-2	34	1	2	-2	-2	5	8	-1
145	4	2	-2	-2	-2	-2	-2	-4	3	-2	3	-2	34	-2	1	6	-2	34	3	-2	-2	-2	6	8	-1
146	-1	-2	50	-1	-2	-2	-2	-4	-4	-2	3	-2	34	-2	1	-2	-2	34	1	-2	-2	-2	5	8	-1
147	-1	4	-1	-1	-1	-1	-1	-1	-1	-2	3	-2	34	-2	1	5	-2	34	1	-2	-2	-2	5	8	-1
148	4	-2	-2	-2	-2	-2	-2	-4	-4	75	-1	-2	-2	-2	1	-2	35	-1	3	1	5	34	-1	-1	34
149	4	1	126	2	-3	5	-4	-4	-2	3	-2	34	-2	1	-2	-2	-2	34	4	-2	-2	-2	34	34	-1
150	4	3	2	2	300	5	52	-1	-2	3	-2	34	-2	1	-2	-2	-2	34	4	-2	-2	-2	34	34	-1
151	-2	4	-1	-1	-1	-1	-1	-1	-1	60	-2	-2	-2	1	-2	-2	-2	34	4	-2	-2	-2	-1	-1	-2
152	-2	4	-1	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	6	4	-2	-2	-2	-2	-1	-1	-2
153	-2	4	-1	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	1	-2	-2	34	3	-2	-2	-2	6	34	-2

RECORD#	IMPS	EXOT	IMPE	POLL	IMPP	DIS	IMPD	GEN	DEM	LTRN	LTRC	INMRT	IMC	PRSN	PC	LEGL	ACT	EFF	HBPRN	HPC	HBL5	UHB	ETA	NME	EXT	EMR	ACTNSN	SUCH	SUCC
103	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	4	-2	-2	-2	2	2	0	0	0
104	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	-2	5	-2	-2	-2	2	2	0	0	0
105	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	5	-2	-2	-2	2	2	0	0	0
106	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	2	11	2	-2	-2	3	1	-2	-2	2	2	0	0	0
107	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	2	11	2	-2	-2	4	1	-2	-2	2	2	0	0	0
108	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	3	1	-2	-2	2	2	0	0	0
109	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	11	2	-2	-2	3	1	-2	-2	2	2	0	0	0
110	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	11	2	-2	-2	12	1	-2	-2	2	2	0	0	0
111	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	-2	4	1	-2	-2	2	2	0	0	0
112	-2	-2	-2	-2	6	34	6	34	-2	-2	-2	-2	-2	-2	-2	2	11	2	0	0	4	-2	-2	-2	2	2	0	0	0
113	34	-2	-2	-2	-2	5	34	-2	6	-2	-2	-2	-2	-2	-2	4	11	2	-2	-2	11	1	-2	-2	2	2	0	0	0
114	-1	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	3	11	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0
115	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0
116	-1	34	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0
117	-1	-2	-2	-2	-2	-1	-1	7	-2	-3	-3	-3	-3	-2	-2	2	11	2	-2	-2	3	-2	-2	-2	2	2	0	0	0
118	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0
119	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	-2	-2	-2	-2	-2	2	2	0	0	0
120	5	-2	-2	-2	-2	5	5	-2	-2	-2	-2	-2	-2	-2	-2	-2	11	2	0	0	2	1	-2	-2	2	2	-2	-2	-2
121	34	34	34	-2	-2	-2	-2	-2	-2	4	-2	-2	3	-2	-2	4	13	1	0	0	5	1	-2	-2	2	1	-2	37	-1
122	34	-2	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	3	2	0	0	5	2	-2	-2	2	2	-2	-2	7
123	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	2	3	2	0	0	4	2	-2	-2	2	2	-2	-2	-2
124	-2	-2	-2	-2	-2	7	7	-2	-2	-2	-2	-2	-2	-2	-2	4	3	2	0	0	5	2	-2	-2	2	2	-2	-2	-2
125	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	3	3	0	0	4	1	-2	-2	2	2	-2	-2	-2
126	-2	34	34	-2	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	4	3	-2	0	0	4	1	-2	-2	2	2	-2	-2	-2
127	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	3	-2	0	0	2	1	-2	-2	2	2	-2	-2	-2
128	34	-2	-2	-2	-2	7	34	7	7	2	1	83	3	75	1	4	12	2	15	2	3	1	-2	-2	2	2	-2	60	-1
129	34	6	6	-2	-2	5	7	-2	-2	-2	6	-2	-2	-2	-2	3	13	1	-2	3	1	1	-2	-2	2	2	-3	-2	7
130	34	34	34	-2	-2	5	7	-2	-2	-2	1	-2	-2	-2	-2	3	13	2	-2	3	11	1	-2	-2	2	2	-3	-2	7
131	34	-2	-2	-2	-2	5	5	-2	-2	-2	-2	-3	3	-2	-2	4	13	1	0	0	10	1	-2	-2	2	2	164	20	-1
132	-1	-2	-2	-2	-2	-1	-1	7	-2	-2	-2	-2	-2	-2	-2	4	13	1	0	0	10	1	-2	-2	2	2	-2	-2	-2
133	-1	-2	-2	-2	34	-1	-1	7	-2	2	1	-2	-2	-2	-2	4	13	2	0	0	5	1	1	1	2	2	150	-2	-2
134	0	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	13	2	0	0	1	1	-2	-2	2	2	-2	-2	-2
135	6	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	13	1	-2	1	5	1	1	1	2	2	-2	-2	-2
136	34	7	34	-2	-2	-2	-2	-2	-2	4	8	-2	-2	-2	-2	4	13	1	0	0	67	1	-2	-2	2	2	-2	56	-1
137	0	-2	-2	34	34	-3	-3	-2	-2	-2	7	-2	-2	-2	-2	2	12	1	0	0	10	1	-2	-2	2	2	-2	-2	7
138	34	34	34	-2	-2	0	0	-2	-2	4	1	-2	4	-2	-2	4	13	1	0	0	1	1	-2	-2	2	2	17	-2	1
139	34	34	34	-2	-2	0	0	-2	-2	4	1	-2	4	-2	-2	4	13	1	0	0	67	1	1	1	2	2	1439	-2	1
140	34	34	34	-2	-2	0	0	-2	-2	3	1	-2	3	-2	-2	4	13	1	0	0	67	1	-2	-2	2	2	-2	-2	1
141	-1	7	34	7	0	7	34	-2	-2	-2	-2	-2	3	-2	-2	4	11	1	-2	-2	2	1	1	6	2	2	-2	-2	4
142	-1	7	34	7	0	7	34	-2	-2	-2	-2	-2	3	-2	-2	4	11	1	-2	-2	-2	1	1	6	2	2	-2	-2	4
143	-1	7	34	7	0	7	34	-2	-2	-2	-2	-2	3	-2	-2	4	11	1	-2	-2	8	1	1	6	2	2	-2	-2	4
144	-1	7	34	7	0	7	34	-2	-2	-2	-2	-2	3	-2	-2	4	11	1	-2	-2	4	1	1	6	2	2	-2	-2	4
145	-1	7	34	7	0	7	34	-2	-2	-2	-2	-2	3	-2	-2	4	11	1	-2	-2	-2	1	1	6	2	1	-2	-2	4
146	-1	7	34	7	0	7	34	-2	-2	-2	-2	-2	3	-2	-2	4	11	1	-2	-2	-2	1	1	6	2	2	-2	-2	4
147	-1	7	34	7	0	7	34	-2	-2	-2	-2	-2	3	-2	-2	4	11	1	-2	-2	-2	1	1	6	2	2	-2	-2	4
148	34	-2	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	16	1	3	13	1	0	0	8	1	-2	-2	2	2	-2	-2	1
149	-1	-2	-2	34	34	-1	-1	-2	-2	-2	2	-2	-2	-2	-2	4	14	2	-2	-2	1	-2	-2	-2	2	2	482	-2	2
150	-1	-2	-2	34	34	-1	-1	-2	-2	-3	1	-2	-2	-2	-2	4	14	2	-2	-2	1	-2	-2	-2	2	2	307	-2	1
151	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-2	-2	10	1	1	6	2	2	-2	-2	-2
152	-2	7	7	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-2	-2	10	1	1	6	2	2	-2	-2	-2
153	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	3	2	-2	-2	8	-2	-2	-2	2	2	-2	-2	-2

RECORD#	FAIL	MAT	OCDR	OCTRN	OTC	POPLS	TAKE
103	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0
120	-2	0	0	0	0	0	0
121	1	0	0	0	0	0	0
122	1	0	0	0	0	0	0
123	-2	0	0	0	0	0	0
124	-2	0	0	0	0	0	0
125	-2	0	0	0	0	0	0
126	-2	0	0	0	0	0	0
127	-2	0	0	0	0	0	0
128	4	0	0	0	0	0	0
129	1	0	0	0	0	0	0
130	1	0	0	0	0	0	0
131	1	0	0	0	0	0	0
132	-2	0	0	0	0	0	0
133	-2	0	0	0	0	0	0
134	-2	0	0	0	0	0	0
135	-2	0	0	0	0	0	0
136	1	0	0	0	0	0	0
137	2	0	0	0	0	0	0
138	3	0	0	0	0	0	0
139	3	0	0	0	0	0	0
140	3	0	0	0	0	0	0
141	1	0	0	0	0	0	0
142	1	0	0	0	0	0	0
143	1	0	0	0	0	0	0
144	1	0	0	0	0	0	0
145	1	0	0	0	0	0	0
146	1	0	0	0	0	0	0
147	1	0	0	0	0	0	0
148	4	0	0	0	0	0	0
149	4	0	0	0	0	0	0
150	2	0	0	0	0	0	0
151	-2	0	0	0	0	0	0
152	-2	0	0	0	0	0	0
153	-2	0	0	0	0	0	0

RECORD#	USFR	ID	NEWID	GRP	NAME	FWS	RG	DATEI	DATEII	DATE	ET	ETGRP	HSTNMN	HNC	INDIVN	IC	HSDIS	CRDIS	POPN
154	06	164	154	b	yellowshoulderedblackbird	03	01	11-Nov-11	19-Nov-76	76	e	B	-2	-2	-2	-2	3	5	-2
155	05	165	155	b	redneckedamazonparrot	03	01	11-Nov-11	25-Jun-79	79	e	B	-2	3	350	-1	1	3	-2
156	04	166	156	b	hawaiicreeper	02	01	11-Nov-11	24-Sep-75	75	e	B	-2	2	-2	2	3	6	1
157	04	167	157	b	poouli	03	01	11-Nov-11	24-Sep-75	75	e	B	-2	-2	-2	-2	-3	6	1
158	19	168	158	b	newellsmxnshsheatwater	02	01	11-Nov-11	24-Sep-75	75	t	b	-2	-2	-2	4	1	9	1
159	25	169	159	r	yellowblotchedmapturtle	03	01	30-Dec-82	14-Jan-91	91	t	r	-3	-3	6324	-1	3	2	-2
160	25	170	160	r	deserttortoisemojavepop	01	02	14-Sep-84	02-Apr-90	90	t	r	-2	-2	-2	-2	1	1	-2
161	25	172	161	r	sandskink	03	01	30-Dec-82	06-Nov-87	87	t	r	-2	-2	-2	-2	3	2	31
162	25	173	162	r	bluetailedmoleskink	02	01	30-Dec-82	06-Nov-87	87	t	r	-2	-2	-2	-2	3	2	20
163	25	174	163	r	gophertortoise	01	02	30-Dec-82	07-Jul-87	87	t	r	-2	-2	-2	-2	1	3	-2
164	10	176	164	r	alabamaredbelliedturtle	03	01	06-Jun-77	16-Jun-87	87	e	R	-2	-2	-2	3	3	2	-2
165	25	177	165	r	flattenedmuskturtle	03	02	06-Jun-77	11-Jun-87	87	t	r	-2	-2	-2	-2	2	2	-2
166	25	178	166	r	ringedsawbackturtle	03	01	06-Jun-77	23-Dec-86	86	t	r	-2	-2	-2	-2	2	2	-2
167	25	179	167	r	conchowatersnake	02	01	30-Dec-82	03-Sep-86	86	t	r	-3	-3	-3	3	3	4	-2
168	11	180	168	r	hierrogiantlizard	02	01	15-Aug-80	29-Feb-84	84	e	R	-2	-2	200	-1	3	6	1
169	26	181	169	r	ibizawalllizard	03	01	11-Nov-11	29-Feb-84	84	t	r	-2	-2	-2	-2	3	4	43
170	26	182	170	r	serpentislandgecko	03	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	4050	-1	3	2	3
171	26	183	171	r	acklinsgroundiguana	02	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	1000	-1	3	2	2
172	26	184	172	r	allenscayiguana	02	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	-2	-2	3	2	-2
173	26	185	173	r	andrusislandgroundiguana	02	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	-2	-2	3	2	-2
174	26	186	174	r	caymanbracgroundiguana	02	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	-2	-2	3	2	-2
175	26	187	175	r	cubangroundiguana	02	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	-2	-2	3	2	-2
176	26	188	176	r	exumaistlandiguana	02	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	-2	-2	3	2	4
177	11	189	177	r	grandcaymangroundiguana	02	01	15-Aug-80	22-Jun-83	83	e	R	-2	-2	50	-1	3	6	1
178	11	190	178	r	jamaicaniguana	03	01	15-Aug-80	22-Jun-83	83	e	R	-2	-2	-2	2	3	6	1
179	26	191	179	r	mayaguanaiguana	02	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	-2	-2	3	6	1
180	26	192	180	r	turksandcaicosgroundiguana	02	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	-2	-2	3	2	-2
181	11	193	181	r	watlingislandgroundiguana	02	01	15-Aug-80	22-Jun-83	83	e	R	-2	-2	-2	-2	3	2	5
182	26	194	182	r	whitecaygroundiguana	02	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	1000	-1	3	6	1
183	26	195	183	r	roundislandskink	03	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	4500	-1	3	6	1
184	11	196	184	r	centralamericanriverturtle	03	01	15-Aug-80	22-Jun-83	83	e	R	-2	-2	-2	-2	3	3	-2
185	26	197	185	r	arubaislandrattlesnake	03	01	15-Aug-80	22-Jun-83	83	t	r	-2	-2	-2	-2	3	2	-2
186	11	198	186	r	larvalleyviper	03	01	15-Aug-80	22-Jun-83	83	e	R	-2	-2	-2	-2	3	2	-2
187	10	199	187	r	monitogecko	03	01	11-Nov-11	15-Oct-82	82	e	R	-3	-3	-3	3	3	5	2
188	25	200	188	r	coachellavalleyfringetoedlizr	03	01	03-Nov-77	25-Sep-80	80	t	r	-3	-3	-3	-3	3	3	-2
189	25	201	189	r	deserttortoisebeaverdamslope	01	02	08-Aug-77	20-Aug-80	80	t	r	2000	-1	350	-1	2	6	1
190	10	202	190	r	plymouthredbelliedturtlema	02	01	06-Jun-77	02-Apr-80	80	e	R	-2	-2	50	2	3	2	11
191	11	203	191	r	fijiislandbandediguana	03	01	11-Nov-11	20-Mar-80	80	e	R	-2	3	-2	3	3	2	-2
192	11	204	192	r	fijicrestediguana	03	01	11-Nov-11	20-Mar-80	80	e	R	-2	-2	-2	-2	3	6	1
193	11	205	193	r	sanestebanislandchuckwalla	03	01	26-Feb-79	20-Mar-80	80	e	R	-2	-2	4500	3	3	6	-2
194	11	206	194	r	roundislandboasbolyerimultoccr	03	01	11-Nov-11	20-Mar-80	80	e	R	-2	-2	-3	1	3	5	-3
195	11	207	195	r	roundislandboasacasareadussumie	03	01	11-Nov-11	20-Mar-80	80	e	R	-2	-2	75	-1	3	5	-2
196	12	208	196	r	americancrocodile	03	01	23-May-75	18-Dec-79	79	e	R	-2	-2	-2	-2	1	1	-2
197	12	209	197	r	saltwatercrocodileexclnewguine	03	02	11-Nov-11	18-Dec-79	79	e	R	-2	-2	-2	-2	1	1	-2
198	11	210	198	r	bolsontortoise	03	01	15-Jun-78	17-Apr-79	79	e	R	-2	-2	-2	-2	1	3	-2
199	27	211	199	r	newmexicanridgenosedrattlesnak	02	01	11-Nov-11	04-Aug-78	78	t	r	-2	3	-2	3	1	2	4
200	27	212	200	r	loggerheadseaturtles	03	01	23-Apr-74	28-Jul-78	78	t	r	-3	-3	-3	-3	4	7	-2
201	27	213	201	r	greenseaturtles	04	01	23-Apr-74	28-Jul-78	78	t	r	-3	-3	-3	-3	4	7	-2
202	12	214	202	r	greenseaturtleflamexbreedpops	01	01	23-Apr-74	28-Jul-78	78	e	R	-3	3	100	-1	4	9	1
203	27	215	203	r	olivepacificridleyseaturtle	03	01	23-Apr-74	28-Jul-78	78	t	r	-3	-3	-3	-3	4	7	-2
204	12	216	204	r	oliveridleyseaturtle mexpacific	01	01	23-Apr-74	28-Jul-78	78	e	R	-3	3	-3	-3	4	9	-2

RECORD#	POPC	ISOL	SMPOPN	SPC	LGPOPN	LPC	MDPOPN	MPC	TRDN	TC	RGLSN	RLC	EXRGL	HBSP	HBST	HBLSN	HLC	EXHBL	PRYSP	PRYST	CAT	IMPCT	HMPRD	IMPH	SPPRD
154	-2	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	1	-2	-2	34	3	-2	-2	-2	-2	-1	-1	34
155	-2	5	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
156	-1	4	-1	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	-1	-1	-2
157	-1	4	-1	-1	-1	-1	-1	-1	-1	3	-2	-2	-2	-2	-2	-2	7	-2	-2	-2	-2	-2	-1	-1	-2
158	-1	4	-1	-1	-1	-1	-1	-1	-1	-2	-2	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
159	4	1	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	1	-2	-2	34	3	2	5	-2	-2	34	34
160	4	3	-2	-2	-2	-2	-2	-4	-4	50	5	-2	-2	-2	1	4	-2	34	3	1	7	34	34	34	34
161	-1	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	1	7	-2	34	3	1	-2	-2	-2	5	5	0
162	-1	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	1	7	64	-1	3	1	-2	-2	-2	5	5	0
163	4	3	-2	-2	-2	-2	-2	-4	-4	79	-1	80	-1	-2	1	4	82	-1	3	-2	-2	-2	34	34	34
164	-2	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	6	-2	1	-2	-2	-2	-3	-3	6	34	34	34	34
165	-2	5	-2	-2	-2	-2	-2	-4	-4	-2	3	27	-1	-2	1	3	-2	6	3	1	5	-2	-2	34	-2
166	4	-2	-2	2	-2	5	-4	-4	-2	1	-2	-2	-2	1	8	-2	2	3	1	5	-2	-2	34	34	5
167	4	3	-2	3	-2	-2	-4	3	-3	-3	27	6	-2	1	4	-2	34	3	1	5	-2	34	34	0	0
168	-1	4	-1	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	1	5	-2	-2	3	1	-2	-2	-2	34	7
169	-1	2	-2	-2	-2	5	-4	-4	-2	-2	-2	-2	-2	-2	4	-2	6	3	-2	-2	-2	-2	34	6	6
170	-1	2	-2	-2	-2	3	-4	3	-2	3	-2	-2	-2	1	7	-2	34	-2	-2	-2	-2	-2	-2	34	34
171	-1	2	-2	-2	-2	-2	-1	-1	-2	3	-2	-2	-2	-2	-2	-2	34	-2	1	5	-2	-2	34	34	-2
172	4	2	87	-1	87	-1	87	-1	-2	3	-2	-2	-2	-2	-2	-2	34	-2	1	5	-2	-2	34	34	-2
173	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	-2	-2	-2	34	-2	1	5	-2	-2	34	34	-2
174	4	2	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	-2	-2	-2	34	-2	1	5	-2	-2	6	6	-2
175	4	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	-2	-2	-2	34	4	1	5	-2	-2	6	6	-2
176	-1	2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	-2	-2	-2	34	3	1	5	-2	-2	34	34	-2
177	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	-2	-2	-2	34	-2	1	5	-2	-2	6	6	-2
178	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	34	-2	1	5	-2	-2	3	-2	-2	-2	-2	6	34	-2
179	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	-2	-2	-2	34	-2	1	5	-2	-2	6	6	-2
180	4	2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	-2	-2	-2	34	-2	1	5	-2	-2	6	6	-2
181	-1	2	-2	-2	-2	-2	-4	-4	-2	3	-2	34	-2	-2	-2	-2	34	-2	1	5	-2	-2	6	6	-2
182	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	-2	-2	-2	34	-2	1	5	-2	-2	6	34	-2
183	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	34	-2	1	7	-2	34	-2	-2	-2	-2	-2	-2	-2	-2
184	-2	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	34	34	-2
185	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	6	4	-2	-2	-2	-2	6	6	-2
186	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	-2	3	-2	-2	-2	-2	-2	-2	-2
187	-1	2	-3	-3	-3	-3	-1	-1	-3	-3	-2	-2	-2	-2	1	6	0	0	-2	-2	-2	-2	0	34	-2
188	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	27	-1	-2	1	-2	51	-1	3	-2	-2	-2	-2	7	34	-1
189	-1	6	-1	-1	-1	-1	-1	-1	83	6	-2	-2	-2	1	-2	-2	34	3	1	5	7	34	34	7	7
190	-1	3	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	1	4	-2	6	3	1	-2	-2	-2	6	34	7
191	4	2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	1	2	-2	34	3	-2	-2	-2	-2	34	34	-2
192	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	1	5	-2	34	3	-2	-2	-2	-2	7	34	-2
193	-2	6	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	1	5	-2	2	-2	1	8	-2	-2	5	34	1
194	-3	-3	-3	-3	-3	-3	-4	-4	-2	-2	-2	-2	-2	1	7	-2	34	3	-2	-2	-2	-2	6	7	-2
195	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	1	7	-2	34	3	-2	-2	-2	-2	6	7	-2
196	4	-2	-2	2	2000	-1	-4	-4	-2	6	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	34	5
197	4	-2	-2	2	-2	-2	-4	-4	-2	6	-2	-2	-2	3	-2	-2	34	3	-2	-2	-2	-2	34	34	5
198	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	1	5	-2	-2	34	34	1
199	-1	2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	34	1	5
200	4	-2	-3	-3	-3	-3	-4	-4	-3	6	-2	-2	-2	-2	1	4	-2	34	-2	-2	-2	-2	34	34	34
201	4	-2	-3	-3	-3	-3	-4	-4	-3	6	-2	-2	-2	1	4	-2	34	-2	2	-2	-2	-2	34	34	34
202	-1	1	-1	-1	-1	-1	-1	-1	-3	6	-2	-2	-2	1	4	-2	34	-2	2	-2	-2	-2	34	34	34
203	4	-2	-3	-3	-3	-3	-4	-4	-3	6	-2	-2	-2	1	2	-2	5	-2	2	-2	-2	-2	34	34	34
204	4	-2	-3	-3	-3	-3	-4	-4	-3	6	-2	-2	-2	1	2	-2	5	-2	2	-2	-2	-2	34	34	34

RECORD#	IMPS	EXOT	IMPE	POLL	IMPP	DIS	IMPD	GEN	DEM	LTRN	LTRC	INMRT	IMC	PRSN	PC	LEGL	ACT	EFF	HBPRN	HPC	HBLB	UHB	ETA	NME	EXT	EMR	ACTNSN	SUCN	SUCC
154	34	34	34	6	34	2	2	-2	-2	-2	1	90	3	-2	1	0	11	3	-2	-2	1	1	-2	-2	2	2	-2	31	-1
155	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	1	3	-2	-2	-2	-2	-2	2	2	-2	-2	-2	
156	-2	34	-2	-2	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-2	-2	-2	-2	-2	2	2	-2	-2	-2	
157	-2	34	-2	-2	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-2	-2	-2	-2	-2	2	2	-2	-2	-2	
158	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-2	-2	-2	-2	-2	2	2	-2	-2	-2	
159	34	-2	-2	6	34	0	0	-2	-2	-2	5	7	-2	-2	-2	4	15	2	-2	-2	67	2	-2	-2	2	2	-2	-2	-2
160	34	6	6	6	34	34	34	-2	6	-2	1	-2	4	-2	-2	2	11	2	-2	2	1	1	-2	-2	2	1	-2	10	7
161	0	-2	-2	-2	-2	6	7	-2	-2	-2	-2	-2	-2	-2	-2	4	11	1	-2	2	5	1	1	13	2	2	-2	-2	-2
162	0	-2	-2	-2	-2	0	0	-2	-2	-2	5	-2	-2	-2	-2	4	11	1	-2	1	5	1	1	13	2	2	-2	-2	-2
163	34	-2	-2	-2	-2	-2	-2	-2	-2	6	1	97	3	-2	-2	3	15	1	-2	-2	1	2	-2	-2	2	2	-2	-2	-2
164	34	6	7	-2	-2	0	0	-2	-2	6	1	-2	3	-2	-2	0	11	3	0	0	11	2	-2	-2	2	2	-2	14	0
165	-2	-2	-2	34	34	6	7	-2	-2	-2	1	-2	3	-2	-2	4	11	2	-2	-2	13	1	-2	-2	2	2	-2	-2	-2
166	5	-2	-2	34	34	0	0	-2	-2	-2	-2	-2	-2	-2	-2	2	15	2	-2	-2	67	1	-2	-2	2	2	-2	-2	-2
167	0	-2	-2	7	7	0	0	7	-2	-3	-3	-2	-2	-2	-2	4	11	-2	0	0	67	2	-2	-2	2	2	-2	-2	-2
168	7	6	34	-2	-2	-2	-2	-2	-2	-2	-3	-2	-3	-2	-2	4	15	-3	0	0	1	1	-2	-2	1	2	-2	-2	-2
169	6	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	15	-3	0	0	1	-2	-2	-2	1	2	-2	-2	-2
170	34	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	4	-2	1	1	-2	2	2	-2	-2	-2
171	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	2	2	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
172	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	2	2	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
173	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	2	2	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
174	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	2	2	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
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176	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	2	2	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
177	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	2	2	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
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179	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	2	3	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
180	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	2	2	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
181	-2	34	34	-2	-2	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	4	2	2	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
182	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	2	2	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
183	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	4	-2	1	1	-2	2	2	-2	-2	-2
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185	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	2	11	-2	-2	-2	-2	1	-2	-2	2	2	-2	-2	-2
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189	34	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-3	-2	-2	4	11	2	-2	-2	10	1	-2	-2	2	2	-2	-2	-2
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191	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	-2	4	1	-2	-2	2	2	-2	-2	-2
192	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	-2	4	1	-2	-2	2	2	-2	-2	-2
193	1	-2	-2	-2	-2	-2	-2	-2	-2	-2	1	-2	-2	-2	-2	2	11	2	0	0	11	1	-2	-2	2	2	-2	-2	-2
194	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	-2	-2	1	-2	-2	2	2	-2	-2	-2
195	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	-2	-2	1	-2	-2	2	2	-2	-2	-2
196	5	-2	-2	-2	-2	5	5	-2	-2	-2	-2	-2	-2	-2	-2	2	4	2	-2	-2	11	2	-2	-2	2	2	-2	-2	-2
197	5	-2	-2	-2	-2	-2	5	-2	-2	-2	-2	-2	-2	-2	-2	2	3	2	-2	-2	11	2	-2	-2	2	2	-2	-2	-2
198	1	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	4	3	-2	-2	5	-2	-2	-2	2	2	-2	-2	-2
199	5	-2	-2	-2	-2	5	5	-2	-2	-2	-2	-2	-2	-2	-2	3	11	1	-2	-2	-2	-2	-2	2	2	-2	-2	-2	
200	34	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	2	3	-2	-2	-2	1	-2	-2	-2	2	2	-2	-2	-2
201	34	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	2	3	-2	-2	-2	1	-2	-2	-2	2	2	-2	-2	-2
202	34	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	2	3	-2	-2	-2	1	-2	-2	-2	2	2	-2	-2	-2
203	34	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	2	3	-2	-2	-2	-2	-2	-2	-2	2	2	-2	-2	-2
204	34	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	2	3	-2	-2	-2	-2	-2	-2	-2	2	2	-2	-2	-2

RECORD#	FAIL	MAT	OCDR	OCTRN	OTC	POPLS	TAKE
154	1	0	0	0	0	0	0
155	-2	0	0	0	0	0	0
156	-2	0	0	0	0	0	0
157	-2	0	0	0	0	0	0
158	-2	0	0	0	0	0	0
159	1	8	0	0	0	0	0
160	3	13	0	0	0	0	0
161	-2	-2	0	0	0	0	0
162	-2	1	0	0	0	0	0
163	-2	17	0	0	0	0	0
164	1	-2	0	0	0	0	0
165	-2	7	0	0	0	0	0
166	-2	-2	0	0	0	0	0
167	-2	-2	0	0	0	0	0
168	-2	-2	0	0	0	0	0
169	-2	-2	0	0	0	0	0
170	-2	-2	0	0	0	0	0
171	1	-2	0	0	0	0	0
172	1	-2	0	0	0	0	0
173	1	-2	0	0	0	0	0
174	1	-2	0	0	0	0	0
175	1	-2	0	0	0	0	0
176	1	-2	0	0	0	0	0
177	1	-2	0	0	0	0	0
178	-2	-2	0	0	0	0	0
179	1	-2	0	0	0	0	0
180	1	-2	0	0	0	0	0
181	1	-2	0	0	0	0	0
182	1	-2	0	0	0	0	0
183	-2	-2	0	0	0	0	0
184	-2	-2	0	0	0	0	0
185	-2	-2	0	0	0	0	0
186	-2	-2	0	0	0	0	0
187	1	-2	0	0	0	0	0
188	-2	-2	0	0	0	0	0
189	1	-2	0	0	0	0	0
190	-2	-2	0	0	0	0	0
191	-2	-2	0	0	0	0	0
192	-2	-2	0	0	0	0	0
193	-2	5	0	0	0	0	0
194	-2	-2	0	0	0	0	0
195	-2	-2	0	0	0	0	0
196	3	-2	0	0	0	0	0
197	3	-2	0	0	0	0	0
198	-2	-2	0	0	0	0	0
199	-2	-2	0	0	0	0	0
200	1	-2	0	0	0	0	0
201	1	-2	0	0	0	0	0
202	1	-2	0	0	0	0	0
203	1	-2	0	0	0	0	0
204	1	-2	0	0	0	0	0

RECORD#	USFR	ID	NEWID	GRP	NAME	FWS	RG	DATEI	DATEII	DATE	ET	ETGRP	HSTNMN	HNC	INDIVN	IC	HSDIS	CRDIS	POPN
205	25	217	205	r	monaboa	02	01	11-Nov-11	03-Feb-78	78	t	r	-2	-2	-2	-2	3	6	1
206	25	218	206	r	monagroundiguana	03	01	11-Nov-11	03-Feb-78	78	t	r	-2	-2	-2	-2	3	6	1
207	25	219	207	r	easternindigosnake	02	01	11-Nov-11	31-Jan-78	78	t	r	-2	-2	-2	-2	1	3	-2
208	25	220	208	r	atlanticsaltmarshsnake	02	01	11-Nov-11	29-Nov-77	77	t	r	-2	-2	-2	-2	2	2	-2
209	25	221	209	r	sanclementeislandnightlizard	03	01	11-Nov-11	11-Aug-77	77	t	r	-2	-2	-2	-2	3	2	3
210	10	222	210	r	giantanole	03	01	11-Nov-11	21-Jul-77	77	e	R	-2	-2	-2	-2	3	6	1
211	25	223	211	r	stcroixgroundlizard	03	01	11-Nov-11	03-Jun-77	77	e	R	-2	-2	300	3	3	2	2
212	10	225	212	r	americancrocodile	01	02	11-Nov-11	24-Sep-75	75	e	R	-2	2	30	-1	1	3	1
213	22	226	213	f	chinooksalmonsacramentowinter	01	02	07-Nov-85	05-Nov-90	90	t	f	86509	-1	441	-1	4	9	1
214	07	227	214	f	cahabashiner	03	01	29-Nov-77	25-Oct-90	90	e	F	-2	-2	-2	3	3	4	-2
215	07	228	215	f	pallidsturgeon	03	01	17-Apr-78	06-Sep-90	90	e	F	-2	2	-2	3	1	1	-2
216	22	229	216	f	neoshamadtom	03	01	30-Dec-82	22-May-90	90	t	f	-2	2	-2	-2	1	4	3
217	07	230	217	f	independencevalleyspeckleddace	02	01	30-Dec-82	10-Oct-89	89	e	F	-2	3	-2	3	3	6	1
218	07	231	218	f	clovervalleyspeckleddace	02	01	30-Dec-82	10-Oct-89	89	e	F	-2	3	-2	3	3	2	3
219	22	232	219	f	pygmysculpin	03	01	18-Mar-75	28-Sep-89	89	t	f	-2	-2	-2	2	3	6	1
220	07	233	220	f	virginriverchub	02	01	23-Aug-78	24-Aug-89	89	e	F	-2	3	-2	3	3	3	1
221	07	234	221	f	roanokeogperch	03	01	13-May-80	18-Aug-89	89	e	F	-2	-2	-2	3	4	4	4
222	07	236	222	f	boulderdarter	03	01	18-Sep-85	01-Sep-88	88	e	F	-2	-2	-2	3	1	4	-2
223	07	237	223	f	shortnosesucker	03	01	30-Dec-82	18-Jul-88	88	e	F	-2	3	-2	2	2	4	-2
224	07	238	224	f	lostriversucker	03	01	30-Dec-82	18-Jul-88	88	e	F	-2	3	-2	3	2	4	-2
225	22	239	225	f	littlecoloradospinedace	03	01	30-Dec-82	16-Sep-87	87	t	f	-3	-3	-3	-3	3	4	5
226	22	240	226	f	blacksidedace	03	01	30-Dec-82	12-Jun-87	87	t	f	-3	-3	-2	-2	3	4	30
227	22	241	227	f	waccamawsilverside	03	01	18-Mar-75	08-Apr-87	87	t	f	-2	3	-3	5	3	6	1
228	22	242	228	f	pecosbluntnoseshiner	02	01	30-Dec-82	20-Feb-87	87	t	f	-2	-2	-3	-3	3	3	-2
229	22	243	229	f	loachminnow	03	01	30-Dec-82	28-Oct-86	86	t	f	-2	2	-2	-2	3	3	8
230	22	244	230	f	spikedace	03	01	30-Dec-82	01-Jul-86	86	t	f	-2	2	-2	-2	3	3	4
231	24	245	231	f	sonorachub	03	01	30-Dec-82	30-Apr-86	86	t	f	-2	-2	-2	3	3	2	-2
232	07	246	232	f	desertpupfish	03	01	30-Dec-82	31-Mar-86	86	e	F	-2	2	-2	3	1	3	-2
233	07	247	233	f	junesucker	03	01	30-Dec-82	31-Mar-86	86	e	F	-3	3	1000	3	3	5	1
234	22	248	234	f	railroadvalleyspringfish	03	01	30-Dec-82	31-Mar-86	86	t	f	-2	-2	-2	-2	3	4	9
235	22	249	235	f	desertdace	03	01	30-Dec-82	10-Dec-85	85	t	f	-2	-2	-2	3	3	4	8
236	22	250	236	f	warnersucker	03	01	30-Dec-82	27-Sep-85	85	t	f	-2	3	-2	3	3	3	-2
237	07	251	237	f	whiteriverspringfish	02	01	30-Dec-82	27-Sep-85	85	e	F	-2	-2	-2	3	3	6	1
238	07	252	238	f	hikowhiteriverspringfish	02	01	30-Dec-82	27-Sep-85	85	e	F	-2	-2	100	2	3	6	1
239	07	253	239	f	whiteriverspinedace	03	01	30-Dec-82	12-Sep-85	85	e	F	-2	3	-2	3	2	4	2
240	07	254	240	f	amberdarter	03	01	30-Dec-82	05-Aug-85	85	e	F	-2	-2	-2	-2	3	6	2
241	07	255	241	f	conasaugalogperch	03	01	30-Dec-82	05-Aug-85	85	e	F	-2	-2	-2	-2	3	6	1
242	07	256	242	f	owenstuichub	02	01	30-Dec-82	05-Aug-85	85	e	F	-2	2	-2	3	3	3	2
243	22	257	243	f	nianguadarter	03	01	10-Dec-80	12-Jun-85	85	t	f	-3	-3	-2	3	3	3	7
244	07	258	244	f	modocsucker	03	01	30-Dec-82	11-Jun-85	85	e	F	-2	1	1300	-1	2	3	-2
245	22	259	245	f	bigspringspinedace	02	01	30-Dec-82	28-Mar-85	85	t	f	-2	-2	-2	-2	2	6	1
246	22	260	246	f	huttontuichub	02	01	30-Dec-82	28-Mar-85	85	t	f	-2	-2	450	3	3	2	2
247	22	261	247	f	foskettsspeckleddace	02	01	30-Dec-82	28-Mar-85	85	t	f	-2	-2	1500	3	3	6	1
248	22	262	248	f	ozarkcavefish	03	01	09-Sep-82	01-Nov-84	84	t	f	-2	-2	-2	3	3	2	14
249	07	263	249	f	smokymadtom	03	01	22-Jun-82	26-Oct-84	84	e	F	-2	-2	67	-1	2	6	1
250	09	264	250	f	yaquichub	03	01	01-Jan-66	31-Aug-84	84	e	F	-2	-2	-2	-2	1	3	-2
251	23	265	251	f	beautifulshiner	03	01	30-Dec-82	31-Aug-84	84	t	f	-2	-2	-2	-2	1	3	-2
252	23	266	252	f	yaquicatifish	03	01	30-Dec-82	31-Aug-84	84	t	f	-2	-2	-2	-2	1	3	-2
253	23	268	253	f	chihuahuachub	03	01	11-Nov-11	11-Oct-83	83	t	f	-2	3	-2	-2	1	1	-2
254	07	269	254	f	ashmeadowsspeckleddace	02	01	10-May-82	02-Sep-83	83	e	F	-2	-2	-2	-2	3	3	4
255	07	270	255	f	ashmeadowsamargosapupfish	02	01	10-May-82	02-Sep-83	83	e	F	-2	-2	-2	-2	3	3	12

RECORD#	POPC	ISOL	SMPOPN	SPC	LGPOPN	LPC	MDPOPN	MPC	TRDN	TC	RGLSN	RLC	EXRGL	HBSP	HBST	HBLSN	HLC	EXHBL	PRYSP	PRYST	CAT	IMPCT	HMPRD	IMPH	SPPRD
205	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-2	3	-2	-2	-2	-2	1	5	-2
206	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-2	3	1	5	-2	-2	1	5	-2
207	4	1	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	1	-2	-2	34	3	-2	-2	-2	-2	34	34	0
208	-2	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	1	-2	1	7	-2	34	3	-2	-2	-2	-2	-1	-1	34
209	-1	2	-2	3	-2	5	-4	3	-2	-2	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	-1	-1	-2
210	-1	4	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	1	7	-2	34	3	-2	-2	-2	-2	-1	-1	0
211	-1	2	100	-1	200	-1	-1	-1	-2	3	-2	-2	-2	-2	-2	-2	34	-2	-2	-2	-2	-2	-1	-1	-2
212	-1	1	-1	-1	-1	-1	-1	-1	-2	-2	-2	34	3	1	7	-2	34	3	-2	-2	-2	34	34	34	34
213	-1	1	-1	-1	-1	-1	-1	-1	99	5	-2	6	0	1	7	-2	34	4	-2	-2	34	34	34	34	34
214	3	2	-2	-2	-2	-2	-4	-4	-2	3	20	-1	3	1	4	-2	34	3	2	-2	34	34	5	34	0
215	4	-2	-2	-2	-2	-2	-4	-4	-2	3	-2	-2	-2	1	8	-2	34	3	2	5	-2	-2	34	34	34
216	-1	2	-2	-2	-2	5	-4	-4	-2	6	33	34	4	1	4	-2	34	3	1	-2	34	-2	0	0	7
217	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	2	5	-2	34	4	1	-2	-2	-2	-2	34	-2
218	-1	2	-2	3	555	-1	-4	-4	-2	3	-2	-2	-2	2	4	-2	34	4	1	-2	-2	-2	-2	34	-2
219	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	0	0	-2	1	5	-2	0	3	-2	-2	-2	-2	5	5	5
220	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	34	-2	1	7	56	34	3	2	-2	-2	34	34	5	-2
221	-1	2	-2	2	-2	-2	-4	3	-2	6	-2	-2	-2	1	4	-2	34	4	1	-2	-2	-2	5	34	5
222	-2	2	-2	-2	-2	-2	-4	-4	-2	3	-2	34	1	1	4	-2	34	3	-2	-2	-2	-2	34	7	5
223	4	2	-2	2	-2	5	-4	-4	95	6	95	34	-2	1	4	95	34	3	-2	-2	34	34	34	34	34
224	4	2	-2	2	-2	-2	-4	-4	95	6	95	34	-2	1	4	95	34	3	-2	-2	34	34	34	34	34
225	-1	2	-3	-3	-3	-3	-4	-4	-2	3	-2	34	-2	1	4	-2	34	3	-2	-2	34	-2	5	5	5
226	-1	2	-2	-2	-2	4	-4	-4	-2	5	-3	34	-2	1	4	-2	34	3	2	-2	-2	-2	5	34	0
227	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	1	5	-2	6	3	1	-2	-2	-2	5	5	5
228	4	-2	-3	-3	-3	-3	-4	-4	-2	6	-2	34	-2	1	4	-2	34	3	-2	-2	-2	-2	0	0	1
229	-1	5	-2	-2	-2	-2	-4	-4	-2	3	85	-1	3	1	4	85	-1	3	-2	-2	-2	-2	0	0	5
230	-1	5	-2	2	-2	-2	-4	5	-2	6	94	34	-2	1	4	-2	34	3	-2	-2	-2	-2	0	0	5
231	4	-2	-2	-2	-2	5	-4	-4	-2	1	0	0	-2	-3	-3	-3	-3	3	-2	-2	-2	34	0	0	7
232	4	-2	-2	2	-2	-2	-4	-4	-2	6	-2	34	-2	1	7	-2	34	3	-2	-2	34	-2	5	5	34
233	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	1	5	-2	34	3	-2	-2	34	-2	34	34	-2
234	-1	2	-2	2	-2	4	-4	-4	-2	3	-2	6	-2	1	6	-2	34	3	-2	-2	-2	-2	0	0	-2
235	-1	2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	1	6	-2	34	3	-2	-2	-2	-2	-1	-1	0
236	4	-2	-2	-2	-2	-2	-4	-4	-2	4	-2	34	-2	1	7	-2	34	3	-2	-2	34	34	0	0	-2
237	-1	4	-1	-1	-1	-1	-1	-1	-2	7	-2	6	-2	1	5	-2	34	3	1	5	-2	-2	0	0	-2
238	-1	4	-1	-1	-1	-1	-1	-1	-2	6	-2	6	-2	1	5	-2	34	3	1	5	-2	-2	0	0	-2
239	-1	2	-2	3	-2	3	-1	-1	-2	3	-2	-2	-2	1	4	-2	6	3	-2	-2	-2	-2	0	0	-2
240	-1	2	-2	2	-2	-2	-1	-1	-2	-2	0	-2	-2	1	7	-2	34	3	1	-2	-2	34	0	0	0
241	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	0	0	-2	1	7	-2	-2	3	1	-2	-2	34	0	0	0
242	-1	-2	-2	3	-2	-2	-1	-1	-2	6	99	34	-2	2	4	-2	34	3	-2	-2	-2	-2	0	0	34
243	-1	3	-2	-2	-2	-2	-4	-4	-2	3	-2	34	-2	1	-2	-2	34	3	1	-2	-2	-2	0	0	-2
244	-2	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	34	-2	1	4	-2	34	2	1	-2	-2	-2	0	0	34
245	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	1	6	-2	34	2	-2	-2	-2	34	-1	-1	-1
246	-1	2	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	1	6	-2	-2	3	-2	-2	-2	-2	0	34	0
247	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	1	5	-2	-2	3	-2	-2	-2	-2	0	34	0
248	-1	-2	-2	2	-2	3	-4	3	-2	3	40	-1	-2	1	4	-2	34	3	1	9	-2	-2	34	34	6
249	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	34	-2	1	5	-2	34	3	1	-2	-2	34	0	0	0
250	4	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	34	-2	1	7	-2	34	3	-2	-2	-2	-2	0	0	-2
251	4	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	34	-2	2	7	-2	34	3	-2	-2	-2	-2	0	0	-2
252	4	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	34	-2	1	7	-2	34	3	-2	-2	-2	-2	0	0	-2
253	2	-2	100	-1	-2	-2	-4	-4	-2	5	-2	-2	-2	1	7	-2	34	3	-3	-2	-2	-2	5	5	7
254	-1	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	34	-2	1	6	-2	34	3	-2	-2	-2	-2	6	34	-2
255	-1	-2	1	-1	-2	-2	-4	-4	-2	6	-2	34	-2	1	6	-2	34	3	-2	-2	-2	-2	6	34	-2

RECORD#	IMPS	EXOT	IMPE	POLL	IMPP	DIS	IMPD	GEN	DEM	LTRN	LTRC	INMRT	IMC	PRSN	PC	LEGL	ACT	EFF	HBPRN	HPC	HBLS	UHB	ETA	NME	EXT	EMR	ACTNSN	SUCN	SUCC
205	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	-2	-2	4	11	-2	-2	-2	-2	1	1	1	2	2	-2	-2	7
206	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	-2	-2	0	11	3	-2	-2	-2	1	1	1	2	2	-2	-2	4
207	0	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	15	2	-2	-2	1	-2	-2	-2	2	2	-2	-2	-2
208	34	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	-2	8	1	-2	-2	2	2	-2	-2	-2
209	-2	6	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	10	1	1	7	2	2	-2	-2	-2
210	0	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	4	1	-2	-2	2	2	-2	-2	-2
211	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	-2	-2	1	1	-2	-2	2	2	-2	-2	-2
212	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	3	-2	-2	4	11	2	-2	2	1	1	1	-2	2	2	15	-2	-2
213	34	-2	-2	34	34	-2	-2	7	-2	-2	8	60	3	-2	-2	4	11	2	0	0	67	2	-1	-1	2	1	-1	-1	1
214	34	-2	-2	34	34	0	34	7	-2	-2	7	-2	-2	-2	-2	4	11	2	0	0	1	2	-1	-1	2	2	-1	-2	-2
215	34	-2	-2	34	34	0	0	-2	-2	-2	0	99	-1	-2	-2	2	11	2	-2	-2	67	2	-1	-1	2	2	-1	-2	0
216	7	6	6	34	34	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	2	-2	1	67	2	-1	-1	2	2	-1	-2	-1
217	-2	34	34	-2	-2	0	5	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	0	0	67	1	-2	-2	2	2	-1	-2	-1
218	-2	34	34	-2	-2	0	5	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	0	0	67	1	-2	-2	2	2	-1	-2	-1
219	5	-2	-2	34	34	5	5	-2	-2	-2	-2	-2	-2	-2	-2	4	11	3	0	0	13	1	-2	-2	2	2	-1	-2	-1
220	-2	7	34	6	34	6	34	-2	7	-2	1	-2	-2	-2	-2	4	11	-2	0	0	67	1	-2	-2	2	2	-1	-2	-1
221	34	-2	-2	34	34	0	0	-2	-2	-2	2	-2	4	-2	-2	4	11	-2	0	0	13	1	-2	-2	2	2	-1	-2	-1
222	5	-2	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	2	-1	-1	2	2	-1	-2	-1
223	34	34	34	34	34	7	7	7	-2	-2	0	-2	3	-2	-2	4	11	-2	0	0	67	2	-1	-1	2	2	-1	0	0
224	34	34	34	34	34	7	7	7	-2	-2	0	-2	3	-2	-2	4	11	-2	0	0	67	2	-1	-1	2	2	-1	0	0
225	5	34	34	34	34	7	7	-2	7	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	2	-1	-1	2	2	-1	-2	-2
226	0	34	-2	34	34	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	13	2	-1	-1	2	2	-1	-2	-2
227	5	-2	-2	34	34	0	0	-2	6	-2	7	-2	-2	-2	-2	4	11	-2	0	0	13	1	-2	-2	2	2	-1	-2	-2
228	34	6	34	34	34	-2	-2	-2	7	-2	-2	-2	-2	-2	-2	4	11	-2	-2	2	67	2	-1	-1	1	2	-1	-2	-2
229	34	5	34	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	2	2	-2	-2	2	67	1	1	-2	2	2	-1	-2	-2
230	34	5	34	34	34	-2	-2	-2	7	-2	6	-2	-2	-2	-2	2	2	-2	-2	2	67	1	1	-2	2	2	-1	-2	-2
231	34	-3	34	-2	34	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	2	11	-2	0	0	13	1	1	1	2	2	-1	-2	-2
232	-2	34	34	34	34	6	-2	-2	-2	-2	7	-2	-2	-2	1	2	11	-2	0	0	67	1	1	-2	2	2	-1	-2	-2
233	-2	34	34	7	-3	-3	-3	-2	-2	-2	0	-2	3	-2	-2	4	11	-2	0	0	67	2	-2	-2	2	2	-1	0	0
234	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	1	1	-2	2	2	-1	-2	-2
235	-2	0	34	-2	-2	0	7	-2	7	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	1	-2	-2	2	2	-1	-2	-2
236	-2	34	34	34	34	7	7	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	2	-1	-1	2	2	-1	-2	4
237	-2	34	34	-2	-2	7	7	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	1	1	-2	2	2	-1	-2	-2
238	-2	34	34	-2	-2	7	7	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	1	1	2	2	2	-1	-2	-2
239	-2	34	34	7	7	7	7	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	2	67	1	1	2	2	2	-1	-2	-2
240	0	0	34	-2	34	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	2	5	1	1	1	2	2	-1	-2	-2
241	0	0	34	-2	34	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	-2	2	5	1	1	1	2	2	-1	-2	-2
242	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	2	-1	-1	2	2	-1	-2	-2
243	-2	-2	34	34	34	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	2	-1	-1	2	2	-1	-2	-2
244	34	34	-2	34	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	10	2	-1	-1	2	2	-1	-2	-2
245	-1	34	34	-2	-2	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	11	1	0	0	67	1	-2	-2	1	2	-1	-2	-2
246	0	-2	34	-2	34	0	34	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	1	-2	-2	2	2	-1	-2	-2
247	0	-2	34	-2	-2	0	34	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	1	-2	-2	2	2	-1	-2	-2
248	34	-2	-2	34	34	-3	34	-2	-2	-2	1	-2	-2	-2	-2	4	11	2	-2	-2	13	1	1	1	2	2	-1	-2	-2
249	0	-2	-2	5	34	0	0	-2	-2	35	-2	-2	-2	-2	-2	4	11	-2	-2	2	13	2	-2	-2	1	2	-1	-2	-2
250	-2	6	34	-2	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	2	11	-2	0	0	67	2	1	4	2	2	-1	-2	-2
251	-2	6	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	2	11	-2	0	0	67	2	1	4	2	2	-1	-2	-2
252	-2	6	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	2	11	-2	0	0	67	2	1	4	2	2	-1	-2	-2
253	7	7	34	34	34	-2	-2	-2	-2	-2	-3	-2	-2	-2	-2	-2	11	-2	0	0	67	2	-1	-1	2	2	-1	-2	-2
254	-2	34	6	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	0	0	5	1	1	11	2	1	-1	-2	-2
255	-2	34	34	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	11	3	0	0	5	1	1	11	2	1	-1	-2	-2

RECORD#	FAIL	MAT	OCDR	OCTRN	OTC	POPLS	TAKE
205	1	-2	0	0	0	0	0
206	1	-2	0	0	0	0	0
207	-2	-2	0	0	0	0	0
208	-2	-2	0	0	0	0	0
209	-2	-2	0	0	0	0	0
210	-2	-2	0	0	0	0	0
211	-2	-2	0	0	0	0	0
212	4	-2	0	0	0	0	0
213	4	3	1	-2	-2	-2	2
214	4	-2	1	-2	-2	-2	2
215	4	-2	1	3	-1	-2	2
216	-1	-2	1	3	-1	-2	2
217	-1	-2	-1	-1	-1	-2	2
218	-1	-2	-1	-1	-1	-2	2
219	-1	-2	-1	-1	-1	-2	2
220	-1	-2	1	0	-1	-2	2
221	-1	4	2	10	-1	-2	2
222	-1	-2	1	2	-1	-3	2
223	4	-2	1	-2	4	2	2
224	4	-2	1	-2	4	3	2
225	-2	-2	1	5	-1	-2	1
226	-2	-2	1	30	-1	10	2
227	-2	1	1	0	0	-2	1
228	-2	-2	1	0	0	-2	1
229	-2	-2	1	8	-1	-2	1
230	-2	-2	1	4	-1	-2	1
231	-2	-2	-2	4	-1	-2	1
232	-2	-2	2	5	-1	-2	2
233	5	-2	1	-2	4	-2	2
234	4	-2	-1	-1	-1	-2	1
235	-2	-2	-1	-1	-1	-2	1
236	4	3	1	4	-1	-2	2
237	-2	-2	1	-1	-1	-2	2
238	-2	-2	1	-1	-1	1	2
239	-2	-2	1	-1	-1	5	2
240	-2	-2	1	1	-1	1	2
241	-2	-2	1	1	-1	0	2
242	-2	-2	1	1	-1	-2	2
243	-2	-2	1	-2	1	1	1
244	-2	-2	2	-2	1	-2	2
245	-2	-2	-1	-1	-1	1	1
246	-2	-2	-1	-1	-1	-2	1
247	-2	-2	-1	-1	-1	-2	1
248	-2	-2	-1	-1	-1	10	2
249	-2	-2	1	1	-1	1	2
250	-2	-2	1	-2	-2	-2	2
251	-2	-2	1	-2	-2	-2	1
252	-2	-2	1	-2	-2	-2	1
253	-2	-2	4	-2	-2	8	2
254	-2	-2	-1	-1	-1	9	2
255	-2	-2	-1	-1	-1	4	2

RECORD#	USFR	ID	NEWID	GRP	NAME	FWS	RG	DATEI	DATEII	DATE	ET	ETGRP	HSTNMN	HNC	INDIVN	IC	HSDIS	CRDIS	POP
256	07	271	256	f	boraxlakechub	03	01	28-May-80	05-Oct-82	82	e	F	-2	-2	-2	-2	3	2	-2
257	07	272	257	f	leonspringspupfish	03	01	11-Nov-11	15-Aug-80	80	e	F	-2	-2	-2	4	3	6	1
258	07	273	258	f	sarmarcosgambusia	03	01	11-Nov-11	14-Jul-80	80	e	F	1000	-1	1	1	3	2	1
259	07	274	259	f	goodenoughgambusia	03	01	11-Nov-11	30-Apr-80	80	e	F	-2	-2	-2	-2	3	13	2
260	07	275	260	f	bonytailchub	03	01	11-Nov-11	23-Apr-80	80	e	F	-2	-2	-2	2	1	3	1
261	09	276	261	f	totoaba	03	01	11-Nov-11	21-May-79	79	e	F	-2	3	-3	-3	2	8	-2
262	22	278	262	f	littlekerngoldentrout	02	01	11-Nov-11	13-Apr-78	78	t	f	-2	-2	-2	-2	3	5	-2
263	22	279	263	f	leoparddarter	03	01	18-Mar-75	27-Jan-78	78	t	f	-2	-2	-2	-2	1	3	5
264	22	280	264	f	alabamacavefish	03	01	11-Nov-11	09-Sep-77	77	t	f	-2	-2	-2	-2	3	6	1
265	22	281	265	f	slenderchub	03	01	11-Nov-11	09-Sep-77	77	t	f	-2	-2	-2	-2	-2	2	-2
266	22	282	266	f	spotfinchub	03	01	11-Nov-11	09-Sep-77	77	t	f	-2	-2	-2	-2	1	3	3
267	22	283	267	f	slackwaterdarter	03	01	11-Nov-11	09-Sep-77	77	t	f	-2	-2	-2	-2	-2	2	30
268	22	284	268	f	yellowfinmadtom	03	01	11-Nov-11	09-Sep-77	77	t	f	-2	-2	-2	-2	2	3	-2
269	07	285	269	f	snaildarter	03	01	20-Jan-75	09-Oct-75	75	e	F	-2	-2	-2	-2	3	6	1
270	07	286	270	f	sciotomadtom	03	01	11-Nov-11	21-Apr-75	75	e	F	-2	-2	-2	-2	3	6	1
271	22	287	271	f	bayoudarter	03	01	11-Nov-11	21-Apr-75	75	t	f	-2	-2	-2	-2	3	5	1
272	07	291	272	f	capefearshiner	03	01	18-Mar-75	25-Sep-87	87	e	F	-2	3	-2	3	3	4	3

RECORD#	POPC	ISOL	SMPOP	SPC	LGPOP	LPC	MDPOP	MPC	TRDN	TC	RGLSN	RLC	EXRGL	HBSP	HBST	HBLSN	HLC	EXHBL	PRYSP	PRYST	CAT	IMPCT	HMPRD	IMPH	SPPRD
256	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	1	7	-2	34	3	2	-2	-2	-2	0	0	0
257	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	34	-2	1	5	-2	34	3	2	-2	-2	-2	-1	-1	-1
258	-1	4	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	1	7	-2	34	3	-2	-2	34	34	-1	-1	0
259	-1	-1	-2	-2	-2	-2	-1	-1	-1	-1	99	-1	-1	1	-1	99	-1	-1	-2	-2	-1	-1	-1	-1	-1
260	-1	4	-2	-2	-2	-2	-4	-4	-2	3	-2	34	-2	2	5	-2	34	-2	-2	-2	-2	-2	-1	-1	-2
261	-2	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	1	-2	-2	34	-2	-2	-2	-2	-2	34	34	6
262	-2	-2	-2	-2	-2	-2	-4	-4	-2	-2	-2	-2	-2	-2	-2	-2	5	3	-2	-2	-2	-2	-1	-1	-1
263	-1	-2	-2	-2	-2	4	-4	-4	-2	6	-2	34	3	1	4	-2	34	3	-2	-2	-2	-2	-1	-1	-1
264	-1	4	-1	-1	-1	-1	-1	-1	-2	6	-2	-2	-2	1	5	-2	34	3	1	9	-2	-2	-1	-1	-1
265	4	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	-1	-1	-1
266	-1	-2	-2	-2	-2	5	-4	-4	-2	6	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	-1	-1	-1
267	-1	-2	-2	2	-2	-2	-4	-4	-2	6	-2	-2	-2	1	-2	-2	34	3	-2	-2	-2	-2	-1	-1	-1
268	4	-2	-2	-2	-2	-2	-4	-4	-2	6	-2	-2	-2	-2	-2	-2	34	3	-2	-2	-2	-2	-1	-1	-1
269	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	3	1	6	-2	-2	3	1	9	-2	-2	-1	-1	-1
270	-1	4	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	1	-2	-2	-2	3	-2	-2	-2	-2	-1	-1	-1
271	-1	1	-1	-1	-1	-1	-1	-1	-2	3	-2	-2	-2	1	7	-2	34	3	-2	-2	-2	-2	-1	-1	-1
272	-1	2	-2	2	-2	4	-4	2	-2	3	-2	6	-2	1	4	-2	34	3	1	-2	-2	34	5	5	5

RECORD#	IMPS	EXOT	IMPE	POLL	IMPP	DIS	IMPD	GEN	DEM	LTRN	LTRC	INMRT	IMC	PRSN	PC	LEGL	ACT	EFF	HBPRN	HPC	HBL5	UHB	ETA	NME	EXT	EMR	ACTNSN	SUCN	SUCC
256	0	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	1	-2	-2	2	1	-1	-2	-2
257	-1	34	34	34	34	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	4	11	-2	0	0	67	1	-2	-2	1	2	-1	-2	-2
258	0	-2	-2	-2	34	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	11	-1	-1	-1	-2	1	-2	-2	1	2	-1	-2	-2
259	-1	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-1	11	-1	-1	-1	67	-1	-1	-1	2	2	-1	-2	-2
260	-2	34	34	34	-2	-2	-2	-2	-2	0	0	99	3	-2	1	-1	11	-1	-1	-1	67	1	-2	-2	2	2	-1	0	0
261	6	-2	-2	7	-2	0	0	-2	-2	-2	8	-2	4	-2	-2	4	3	2	-2	2	67	2	-1	-1	2	2	-1	-2	-2
262	-1	34	-2	5	34	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	14	2	-1	-1	2	2	-1	-2	-2
263	-1	-2	-2	34	34	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	67	2	-1	-1	2	2	-1	-2	-2
264	-1	-2	-2	-2	34	-1	-1	-2	-2	-2	1	-2	-2	-2	-2	-1	-1	-1	-1	-1	67	1	-2	-2	2	2	-1	-2	-2
265	-1	-2	-2	6	34	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	15	2	-1	-1	2	2	-1	-2	-2
266	-1	-2	-2	-2	34	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	13	2	-1	-1	2	2	-1	-2	-2
267	-1	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	1	2	-1	-1	2	2	-1	-2	-2
268	-1	-2	-2	-2	34	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	16	2	-1	-1	2	2	-1	-2	-2
269	-1	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	-2	2	-1	-1	2	2	-1	-2	-2
270	-1	-2	-2	34	34	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	-2	1	-2	-2	2	2	-1	-2	-2
271	-1	-2	-2	-2	34	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	5	1	-2	-2	2	2	-1	-2	-2
272	5	-2	-2	34	34	-2	-2	-2	-2	-2	-3	-3	-3	-2	-2	4	11	-2	0	0	67	2	-1	-1	2	2	-1	-3	-3

RECORD#	FAIL	MAT	OCDR	OCTRN	OTC	POPLS	TAKE
256	-2	-2	-1	-1	-1	-2	2
257	-2	-2	-1	-1	-1	1	2
258	-2	-2	1	-1	-1	-2	2
259	-2	-2	0	0	-1	1	2
260	4	-2	1	-2	-2	-2	2
261	4	-2	-1	-1	-1	-2	2
262	-2	-2	1	-2	4	-2	2
263	-2	-2	1	3	-1	-2	2
264	-2	-2	-1	-1	-1	-2	2
265	-2	-2	2	-2	-2	-2	2
266	-2	-2	1	3	-1	9	2
267	-2	-2	5	30	-1	-2	2
268	-2	-2	2	-2	-2	3	2
269	-2	-2	1	0	0	-2	2
270	-2	-2	1	1	-1	-2	2
271	-2	-2	1	4	-1	-2	2
272	-2	-3	1	4	-1	3	2

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