CONABIO

Identifying Priority Species for Conservation in Mexico





On its 61st section, the General Wildlife Act (Ley General de Vida Silvestre, LGVS) establishes that:

The Secretariat of Environment and Natural Resources […] will develop the list of priority species and populations for conservation that will be published in the Official Federation Diary (DOF).

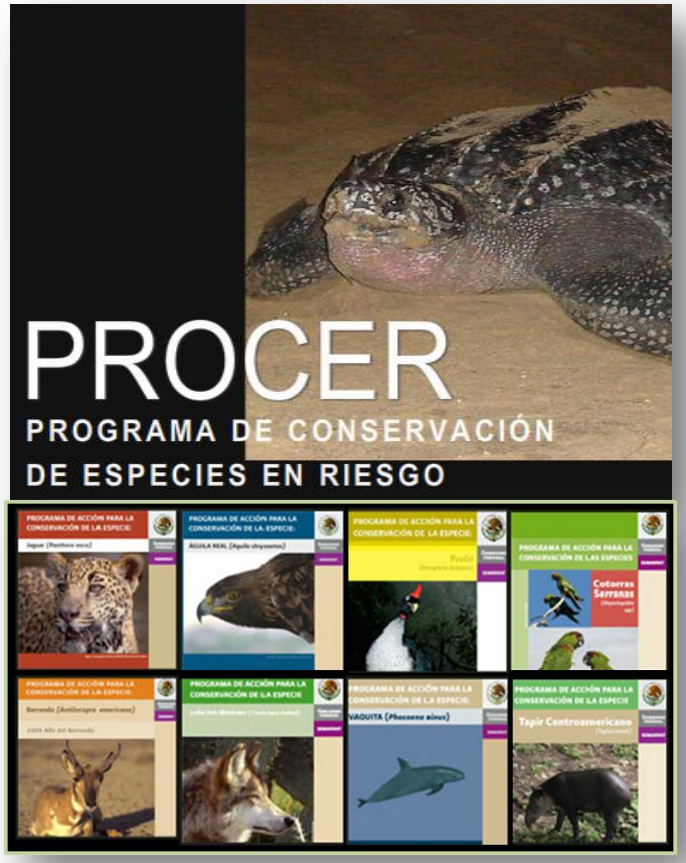
There are two complementary strategies in the international framework for biodiversity conservation:

1) Conservation of natural areas and ecosystems

2) Wildlife conservation

a) Determination of the extinction risk for wildlife species and populations: (MER) NOM-059-SEMARNAT-2010

b) Implementation of recovery and conservation programs



Why do we need a priority species list?

- The concept provides the opportunity to link the two conservation strategies.
- It is necessary to optimize efforts and maximize conservation outcomes.
- Is a mandate of the General Wildlife Act

Criteria to define the priority species concept

Section 61st of the GWA establishes that:

Species and populations will be included in the list [of priority species] if they at least follow into one of the following categories:

a) Being of strategic importance for the conservation of other species and habitats.

b) Being important in maintaining ecosystem structure and function.

c) Being endemic and threatened with extinction.

d) Being of social, cultural, scientific, or economic interest.

In Mexico priority species have been defined as such for several reasons:

Charismatic

Key species

Ecosystem representative

Phylogenetic or evolutionary relevance

Extinction risk

Traditional use

Economic value

Such species can be classified as:

Umbrella

Flag

Key

At risk

socially relevant

The concept of surrogate (proxy) species:

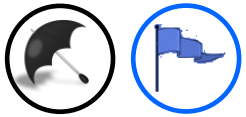
"Species that are used to represent other species or aspects of the environment to attain conservation objectives."

(Wiens *et al*., 2008; Caro, 2010).

Some practical uses of surrogate species:

- **Identify important areas for conservation.**
- **Monitor environmental changes.**
- **Inform the design and operation of conservation programs.**

This concept coincides with the assumptions in section 61st of the GWA



a) Being of strategic importance for the conservation of other species and habitats.

b) Being important in maintaining ecosystem structure and function.

c) Being endemic and threatened with extinction.

d) Being of social, cultural, scientific, or economic interest.

General goal

Identify priority species for biodiversity conservation in Mexico that allow to optimize conservation efforts and maximize benefits towards the conservation of other species, habitats, and ecosystems.

Specific objectives

- **Compile of a preliminary list of priority species** from those species and populations that have been recognized as important from a conservation point of view.

- **Evaluate the list by taxonomic specialists** to obtain a hierarchical list.

- **Review and complete the list in a workshop with conservation professionals** in order to assess the impact that the selected species may have on the conservation of other species, habitats, and ecosystems.

Clarification

The priority species list does not pretend to be a list of species at risk of extinction (covered by the NOM-059-SEMARNAT-2010), but one that maximizes conservation efforts.

This process is a starting point to comply with section 61st of the GWA that establishes that the priority species list will be reviewed at least once every three years.

Methods

1. Compilation of a preliminary list of priority species.
2. Evaluation of the list by taxonomic specialists.
3. Evaluation of the list by conservation and management specialists in a workshop.

1. Compiling a preliminary list of priority species

- Wildlife Conservation and Productive Diversification in the Rural Sector Program 1997 – 2000 (DGVS-SEMARNAP, 1997)
- National Wildlife Strategy. Achievements and Challenges for Sustainable Development 1995 – 2000 (INE, 2000)
- Priority Species Recovery Programs (SEMARNAT)
  PROCER and PACE (CONANP, 2009)
- Proposals with technical elements (ej. Sánchez, 2011; Berlanga, com. pers., 2011)
- NOM-059-SEMARNAT-2010

At this first stage the list was composed by 302 species

1.1. Criteria development for species evaluation

Six criteria were defined to evaluate different aspects of each species and subspecies (values: 1-5 points in each criterion).

Criterion A	The species can effectively contribute to the conservation of other species, habitats, or ecosystems
Criterion B	The species can contribute to the conservation of key or irreplaceable ecological processes
Criterion C	The species enjoys social recognition due to its economical importance as driver for conservation
Criterion D	The species is of emblematic or cultural importance
Criterion E	The species is endangered, phylogenetically unique, or endemic to Mexico, which implies a risk of extinction within 10 – 20 years
Criterion F	The species' recovery is viable within 10 – 20 years and can lead to synergy of national or international conservation agreements or programs

2. Evaluation by taxonomic specialists

PLANTS	ANIMALS
Cycads	Corals
Conifers	Freshwater fish
Agaves	Marine fish
Orchids	Amphibians
Palms	Reptiles
Cactus	Birds and monarch butterfly
Magnoliopsida (various families)	Mammals

Each criterion was evaluated with the following values:

1= Very low
2= Low
3= Medium
4= High
5= Very high

Participation of 111 specialists from 37 institutions.

From the 111 surveys sent, 46 technical evaluations were received from 12 of the 14 plant and animal groups

- To classify the species according to the results, the resulting interval score (6 to 30 pts) was divided in thirds.
- Thus, three priority hierarchies were defined:

Score	Hierarchy
30 to 22.1	High priority
22 to 14.1	Medium priority
14 to 6	Low priority

- Additional species suggested by the specialists were analyzed
- At this point of the analysis, the list grew from **302 species and subspecies to 415**
- Final scores for all species were averaged
- Hierarchy was applied:

    a) Within each taxonomic group

    b) To all evaluated species and subspecies in order to compare them directly.

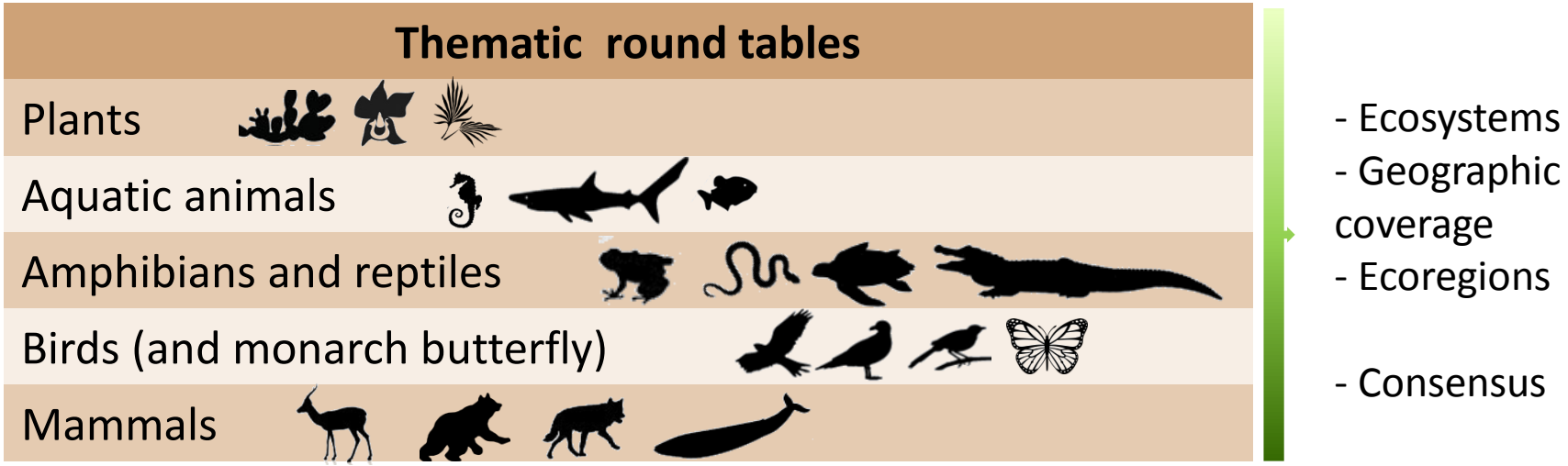
3. Evaluation of the list by conservation and management specialists in a workshop

1. **Analyze the results of the evaluations** developed by the taxonomic specialists

2. **Select a list of higher priority species** that can optimize the conservation efforts while maximizing the benefits towards other species, habitats, and ecosystems.

3. **Identify strategic approaches** to optimize the use of the priority species list.

40 experts in design and management of conservation strategies participated in the workshop



- The proposed species were analyzed within a broad strategic perspective according to the hierarchical categories (high, medium, and low).

- Results of these analyses were compared with those obtained during the survey and each round table compiled a synthesis to prioritize the species.

- Whenever taxonomically related species had similar evaluations, they were grouped together.

Results

Priority species proposed by the experts:

483*

Priority hierarchy for the species in the list:

Priority hierarchy for conservation	Number of species
High priority	319
Medium priority	129
Low priority	35
Total	483*

*The genus Ipomoea (with species to be defined) needs to be considered as high priority

Kingdom	Phylum	Class	Priority category	Total
Plantae  Floristic estimations in Mexico oscillate between 22,000 and 31,000 species*	Cycadophyta	Cycadopsida	High	43
			Medium	3
	Coniferophyta	Pinopsida	High	14
			Medium	1
	Pteridophyta	Filicopsida	High	3
	Magnoliophyta	Liliopsida	High	25
			Medium	20
			Low	3
		Magnoliopsida	High	32
			Medium	28
Total Plantae				172

* (Rzedowski, 1991; Toledo, 1993; Villaseñor, 2003, 2004)

Kingdom	Phylum	Class	Priority category	Total
Animalia 	Cnidaria	Anthozoa	High	2
	Arthropoda	Insecta	High	1
	Mollusca	Bivalvia	High	2
		Gastropoda	High	7
	Echinodermata	Echinoidea	High	1
	Chordata	Petromyzontida	Medium	1
		Chondrichthyes	High	7
			Medium	2
			Low	3
		Actinopterygii	High	46
			Medium	24
			Low	6
	Craniata	Amphibia	High	12
			Low	6
		Reptilia	High	34
			Medium	5
			Low	3
		Aves	High	60
			Medium	41
			Low	7
		Mammalia	High	30
			Medium	4
			Low	7
Total Animalia				**311**

Number of species described for Mexico oscillate*:

- **Invertebrate non-arthropods**
  7,252 - 7,452
- **Arthropods**
  47,768 - 47,853
- **Terrestrial vertebrates**
  5,488

  Amphibians 361
  Reptiles 804
  Birds 1096
  Mammals 535 (terrestrial and marine)
- **Freshwater, marine and estuarine fishes**
  2,692

*(CONABIO, 2008)

- Some species were listed individually whereas other were grouped.
- It was recommended to give individual attention to 205 species and subspecies (128 high priority).
- 29 groups include 278 species
(plus one genus for which species need to be defined)

Plants		
Group	Proposed group name	Species per group
1	Burseras	3
2	Cactus	30
	Lophophora	2
3	Cycads	46
4	Ficus	10
5	Arborescent Ipomoeas	TBD
6	Orchids	35

Aquatic animals		
Group	Proposed group name	Species per group
7	Abalones	5
8	Corals	2

Amphibians		
Group	Proposed group name	Species per group
9	Agalychnis	2
10	Ambystomatidae	5
11	Endemic Lithobates	5

Reptiles		
Group	Proposed group name	Species per group
12	Crocodylia	3
13	Crotalus	9
14	Gopherus	3
15	Iguanidae	11
16	Sea turtles	6

Birds		
Group	Proposed group name	Species per group
17	Neotropical eagles	4
18	Pelagic birds	12
19	Turkeys	2
20	Endemic yellowthroats	3
21	Ducks and geese	33
22	Psittacids	21

Mammals		
Group	Proposed group name	Species per group
23	Whales	4
24	Carnivore pinnipeds	4
25	Cervids	4
26	Lagomorphs	7
27	Bats	2
28	Odontocetos	2
29	Primates	3

Next steps

Other groups of species that were identified as relevant need to be analyzed in the next three years is to fill important taxonomic and geographic gaps. They include:

- Marine invertebrates
- Crustaceans
- Fungi
- Marine, freshwater, and coastal plants
- Other bat species

In synthesis

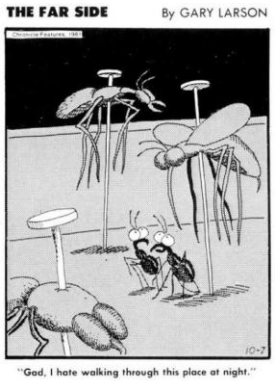
- The proposed species list is the result of expert knowledge and systematic work.

- 483 species and subspecies* of plants and animals are included (320 high priority, 129 medium priority and 35 low priority).

- 29 groups of species in the list include a total of 278 species*.

- the rest 205 species are listed individually

(*plus one genus with species to be defined)



Thank you!
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