Invasive Alien Species: Official List for Mexico

Ecosistem Conservation Working Table
XVII Meeting of the Trilateral Committee for Wildlife and Ecosystem Conservation and Management
Shepherdstown, West Virginia – May 13 – 16, 2013
Outline

• Background
• The process
• Criteria to define invasive species
• Results: list of invasive species
• Categories and examples
• Next steps
General Law of Ecological Equilibrium and Environmental Protection (before 2010)

Art 8. Protection of flora and fauna in national territory against the harmful action of exotic species, pests and diseases...

Art. 85. Establishment of regulating measures for the export and import of native or exotic specimens and restrictions for the movement within the country of imported species or those destined for export.

Until 2010 no there was no mention of the term invasive species in environmental laws
Changes in Environmental Laws in 2010

General Wildlife Law

Defines the term Invasive exotic species:

• Non native species or populations outside its natural distribution, capable of surviving, reproducing and establishing in natural habitats threatening native biodiversity, economy or public health.

Art 27. The liberation or introduction of exotic species to natural habitats and ecosystems is forbidden. The secretariat will publish the listings of invasive exotic species, these will be updated every 3 years or earlier if needed.

Official standards will be published for the prevention of entry of invasive exotic species, and the management, control and eradication of those already established or those with accidental or illegal introductions.

It is forbidden to introduce exotic invasive species or wild species that are carriers of such species.
Questions to be answered

• What species do we have established in Mexico?
• Where?
• What is their status?
• What are their impacts?
• How do we make a list that fullfills all the new requirements in the law?
**Starting point**

- List of ca. 1400 exotic species
- 358 thought to be invasive
Species that were added to the list

- If the species is already regulated or in an official listing (i.e. 63 weeds)

- If there is a Risk Assessment for Mexico that identifies the species as invasive
Risk analysis

Pros

• Standardized systems
• Based on scientific evidence
• Solid results
• Verifiable and comparable
• Used in decision making
• Multidisciplinary efforts

Cons

• They can take a long time
• They need detailed information that is not always available
Review of Risk Analysis tools

Review of
• Short and full RA
• Prescreening tools

Comparing
• Impact categories
• Data requirements
• Time to prepare
• Scoring methodology
• Handling of uncertainty
Workshop

50 experts from 32 institutions, including the Ministries of Environment and of Agriculture

Groups:
- Plants
- Aquatic invertebrates
- Terrestrial invertebrates
- Fish
- Terrestrial vertebrates
Criteria to assess invasiveness

- Applicable to all groups possible?
- Based on available information
- Rapid evaluation of a species
- Consider all relevant impacts
- Enough questions to ensure precision of the model

Heikkilä, 2011
Criteria to define invasive species

General criteria

1. Invasiveness
2. Risk of introduction
3. Impacts

10 questions
Questions before starting the analysis:

- Is there a Risk Analysis for Mexico for this species?
  - Yes → The result from the RA is accepted and it is **not necessary** to carry out the analysis
  - No
    - Is the species native from or has become established in places with climatic compatibility with Mexico?
      - No → It is impossible for the species to become established in Mexico, therefore it is **not necessary to carry out the analysis**.
      - Yes → Evaluate the species
Screening for Invasiveness

Reported as invasive → Relationship with invasive taxa → Vector for other invasive species

Risk of entry
Probability of being introduced to the country or to new areas

Risk of establishment
Probability of reproducing and starting new populations + mitigation measures

Risk of dispersal
Probability of expanding their range to new areas + mitigation measures

Social, economic impacts
Health impacts
Ecological impacts
Environmental impacts

Uncertainty
Criteria for Invasiveness

• Reported as invasive
  – By a RA or another assessment

• Relationships with invasive taxa (same genus, family..)
  – Documented evidence of invasiveness in one or more species with similar biology in the taxa of the evaluated species.

• Vector of other invasive species
  – Potential to transport other invasive species including, pathogens and parasites that could affect wildlife.
Risk of introduction

- Risk of introduction to the country/new area
  - Probability of entering the country or of continuing introductions. The pathway or number of pathways and the number of individuals and frequency of introduction.

- Risk of establishment
  - Probability that the species will reproduce and establish viable populations. Takes into account availability of mitigating measures.

- Risk of dispersal
  - Probability that the species will expand its geographic range. Takes into account available mitigation measures.
• **Sanitary**
  – Impacts to human, animal or plant health i.e. Poisonous, toxic, allergies, carriers of parasites, etc.

• **Social and economic**
  – Impacts to the economy and society. i.e. increases in cost of productive activities, damage to infrastructure, economic losses, loss of local traditions, etc.

• **Environmental**
  – Physical and chemical changes in water, soil and light.

• **Ecological**
  – Impacts to ecosystems and communities: predation, hybridization, competition, etc.
Types of answer

- Very high
- High
- Medium
- Low
- No

- *Unknown*

  - Documented evidence
  - No information
# Uncertainty of the Information

<table>
<thead>
<tr>
<th>Uncertainty</th>
<th>Examples of information sources</th>
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<tbody>
<tr>
<td>Minimum</td>
<td>High quality sources such as:</td>
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<tr>
<td></td>
<td>• Different independent sources</td>
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<tr>
<td></td>
<td>• Books or scientific or technical papers that have gone through peer review</td>
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<td></td>
<td>• Official records* or publications (with editorial approval) (*SAGARPA, SEMARNAT, S Salud, NAPPO, OIRSA etc.)</td>
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<td>• Information from experts</td>
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<tr>
<td>Low</td>
<td>• Specialized databases (WOS, CABI, ISSG)</td>
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<tr>
<td></td>
<td>• Unpublished scientific or technical document (developed by specialists)</td>
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<tr>
<td>Medium</td>
<td>• Scientific or technical document without peer review</td>
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<td></td>
<td>• Publication of a specialist amateur</td>
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<td></td>
<td>• Databases that are not peer reviewed</td>
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<tr>
<td>High</td>
<td>• Contradictory information</td>
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<td></td>
<td>• Low quality sources</td>
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<td></td>
<td>• Information from other species/congeneric</td>
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<tr>
<td>Maximum</td>
<td>• Lack of evidence</td>
</tr>
<tr>
<td></td>
<td>• Only one low quality source</td>
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*Based on Koop et al., 2011*
Database
Results

352 invasive species

- Vertebrates (41)
- Plants (85) (+ 62 Nom 043)
- Terrestrial invertebrates (39)
- Aquatic invertebrates (23)
- Fish (102)

May 2013
Categories

• **Not present in Mexico**
  – Regulated through imports/exports
  – Prevention measures

• **Present in Mexico**
  – Regulated through imports/exports
  – Prevention, management, control and eradication

• **Status unknown**
  – Research

• **Native-Translocated**
  – Regulated through imports/exports
  – Prevention, management, control and eradication
• Not present in Mexico
  Regulate through imports(exports)
  Establish prevention measures

Examples

Zebra and Quagga mussels
*Dreissena polymorpha* and
*D. buguensis*

Giant Hogweed
*Heracleum mantegazzianum*

Kudzu
*Pueraria montana*
• **Present in Mexico**
  – Regulate through imports/exports
  – Identify areas that are not invaded and protect NPAs
  – Implement prevention, management, control and eradication measures according to each situation

*Rottboellia cochinchinensis*

Loricarid fishes

*Red imported fire ant Solenopsis invicta*

Monk Parakeet *Myiopsitta monachus*
• Status unknown
  – Research needs

Snakehead fishes

Golden apple snail
*Pomacea canaliculata*
• Native translocated
  – Regulate through imports/exports
  – Prevention, management, control and eradication

*Boa constrictor imperator*

*Trachemys scripta elegans*

*Astyanax mexicanus*
Next steps

✓ Develop methodology
✓ Species evaluations
✓ Detection of errors and calibration

• Revision of results and method (27-28th of June 2013)
• Public consultation
• Adjustments
• Final publication
Áreas naturales protegidas con registros de especies no nativas

Simbología

Registros de especies por ANP

- 183 - 330
- 99 - 182
- 59 - 98
- 36 - 58
- 20 - 35
- 8 - 19
- 1 - 7
- Zona económica exclusiva

Sistema de Coordenadas Planas
Proyección: Cónica Conforme de Lambert
Datum: WGS 1984

CONABIO. 2013. Áreas naturales protegidas con registros de especies no nativas. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. México.
Áreas naturales protegidas con registros de especies invasoras

Simbología

Registros de especies por ANP

- 52 - 57
- 47 - 51
- 41 - 46
- 35 - 40
- 30 - 34
- 24 - 29
- 18 - 23
- 12 - 17
- 7 - 11
- 0 - 6
- Zona económica exclusiva

CONABIO. 2013. Áreas naturales protegidas con registros de especies invasoras. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. México.
This listing is only the first step

Interinstitutional and expert collaboration is essential

There are still legal gaps to be addressed

Define strategies to attend to different cases / habitats

Invasive species are a regional problem with direct and indirect effects on the conservation of native biodiversity and should be an issue of high priority.
To all experts that participated in the process.
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