



# Five-Factor Analysis



Coachella Valley milk-vetch



Neosho mucket mussel



jaguar



Miami blue butterfly



coqui llanero

# 5-Factor Analysis

- Factors are listed in section 4(a)(1) of the Act but not defined
- Analysis includes **present** threats and threats anticipated into the **near future**
- Does factor pose a threat to species at the population or species level?



# What to include in the analysis

- Discuss each pertinent threat in detail. Be sure to explain how a threat affects the species:



- Exposure and Response
- Include a discussion on the severity and immediacy of the threat
- Temporal evaluation of threats (but don't use term "foreseeable future")
- Balance threats with conservation efforts



# What to include in the analysis (cont'd)

- Include a summary under each factor stating whether a threat is present or not
- Include an overall summary paragraph on all threats
  - In a proposed/final listing rule, this should set up the determination of status (T or E) section
  - Conclusion should not be a surprise to reader – connect logic train



# What **NOT** to include

- “Kitchen sink” approach – don’t just list potential exposures. Analyze exposure and response.
- Legal “terms of art”:
  - Do not use in factor summaries, only in finding/determination section
  - Threatened
  - Foreseeable future
  - Magnitude and imminence



# A. The present or threatened destruction, modification or curtailment of its habitat or range

- Cite specific projects or land use practices and extent of impact across range
  - Climate change - what on-ground effects of climate change act on the species?
  - Invasive species – e.g., nonnative plants or predators affecting habitat



Red tree vole



## B. Overutilization for commercial, recreational, scientific, or educational purposes



Ozark hellbender



Miami blue butterfly; H.L. Salvato





## C. Disease or predation

- Diseases that have a clear indication of threat to species
- Predation (include grazing/herbivores)



White-nose syndrome in bats



*Dubatia waialealae*



## D. The inadequacy of existing regulatory mechanisms

LACK of regulatory mechanisms



Inadequacy of existing regulatory mechanisms



# Factor D, continued

- Of the regulatory mechanisms that exist, are there any that are inadequately working as designed (faulty in some way)?
  - Enforcement
  - Funding
  - Implementation



# Factor D, continued

- A threat under Factor D doesn't stand alone – ties to a threat discussed under another factor



Gray wolf



Canada lynx

# Factor D, continued

- Example: regulatory mechanism requires collection permits for a butterfly
  - No enforcement of permit issuance
  - Evidence of unauthorized collection occurring
  - Overcollection poses a threat to species (Factor B)



Spring Mountains Acastus Checkerspot butterfly



# Factor D, review

- What regulatory mechanisms exist that are relevant to species and threats?
- Are mechanisms achieving what they are designed to do?
- If not, what threat (under another factor) is being caused or is allowed to persist?



## E. Other natural or manmade factors affecting its continued existence

- Direct mortality of individuals
- Competition from non-native species
- Small population size effects  
(genetic inbreeding, Allee effects)
- Environmental contaminants



Hurricane Isabel, 2003



# Cumulative Effects from Factors A through E

- One factor by itself may not pose threat, but in combination with other factors, it rises to level of a threat.
- How does the combination of any 2 or more factors compound threat level?



Lesser prairie-chicken



# Skill Check: Factor D

Nevada Revised Statute sections 503 and 527 offer protective measures to wildlife and plants, but do not specifically include protections for invertebrate species, such as the Spring Mountains acastus checkerspot butterfly. Because applicable State regulatory mechanisms that could protect the Spring Mountains acastus checkerspot butterfly are not inclusive of invertebrates, they are not effective in relieving the threats faced by the Spring Mountains acastus checkerspot butterfly.

**Would you conclude that there is an inadequacy of the existing regulatory mechanism? Why or why not?**



# 5-Factor Analysis applied:

- Candidate Evaluation
- Petition Findings (90-day, 12-month)
- Proposed Rule for Listing/Delisting
- Final Rule for Listing/Delisting
- Recovery Planning



## 5-year Reviews

# Where We Are Now

- Incorporate threats assessment
- SSA and others
- “Storytelling” approach
- Factors discussed holistically rather than separately
- Eases analysis of cumulative threats

