

# Wildlife Ecology, Conservation and Management





Genetics

Population  
Biology

Physiology

Animal  
Ecology

# Wildlife Ecology, Management and Conservation

Ecology

Behavior

Zoology

Epidemiology

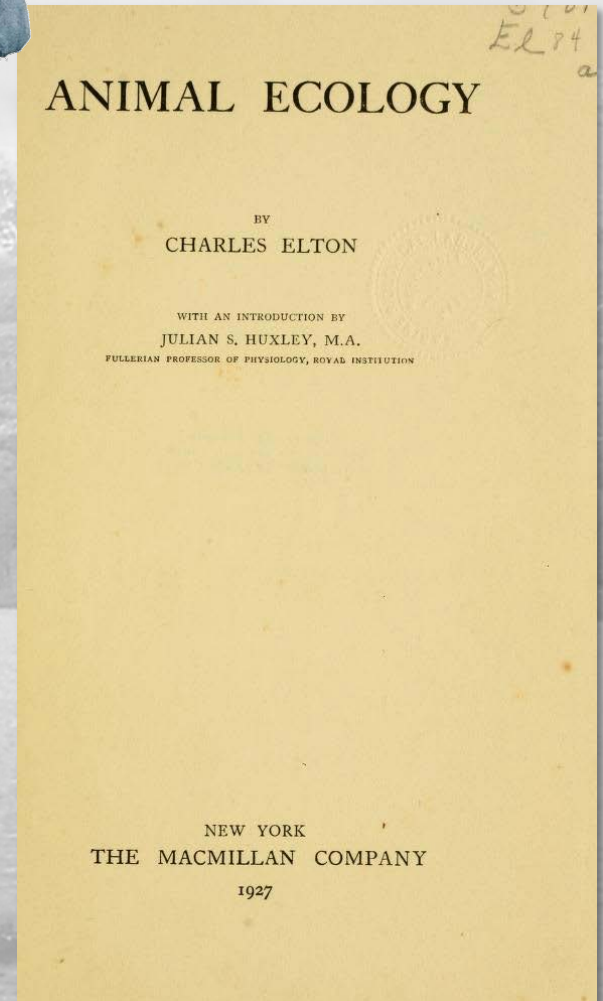


# Animal Ecology



«*Scientific Natural history*» (Elton 1927):

- Emphasizing the study of **animal populations** in their natural environment
- Bridging Zoology and Ecology: the study of animal populations and their relationship with the environment

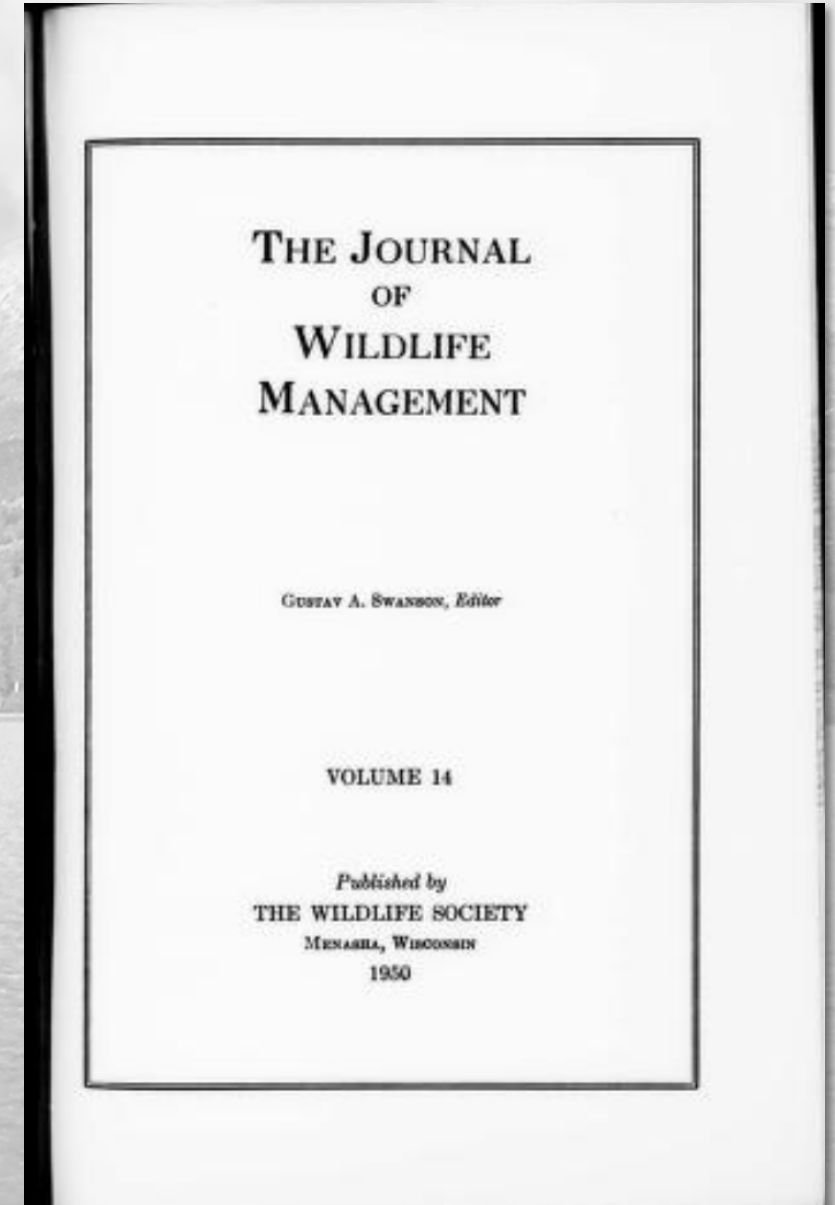




# What do we mean by 'Wildlife'?

First issue of *The Journal of Wildlife Management* (1937):

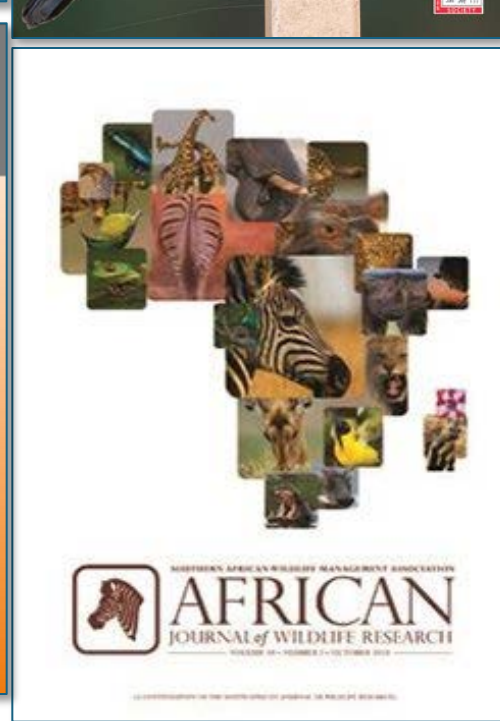
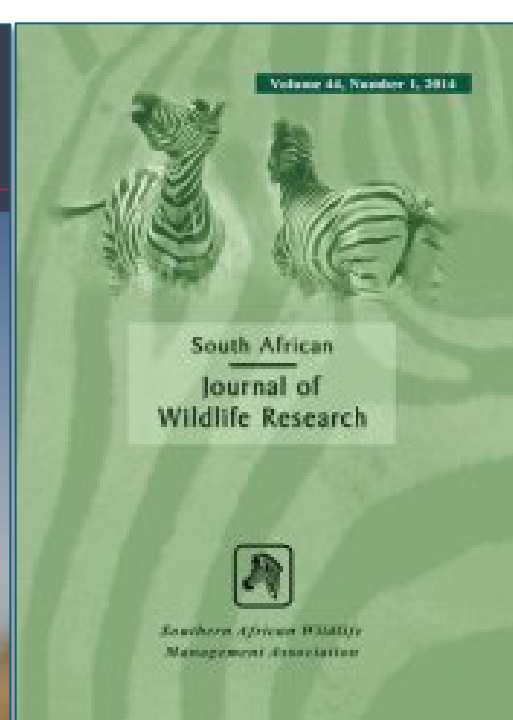
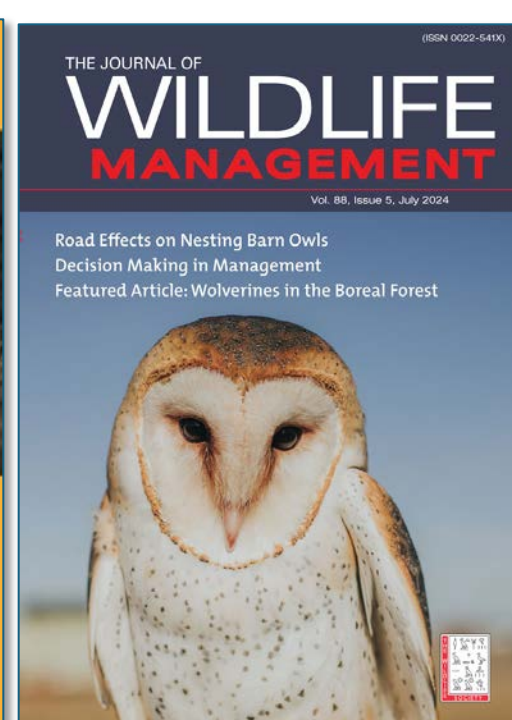
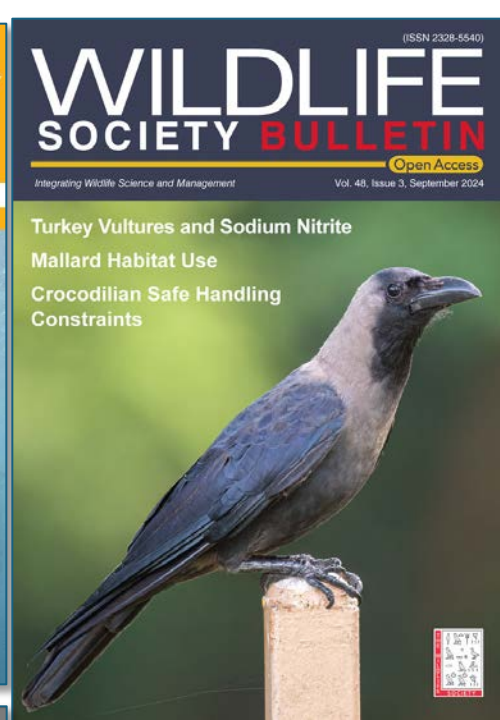
- wildlife management actions ...  
    *"along sound biological lines are also part of the greater movement for conservation of our entire native fauna and flora"*



# What do we mean by 'Wildlife'?

- traditionally, 'wild life' as game (i.e., harvested) species (Leopold, 1933)
- all free-ranging undomesticated animals (Bolen & Robinson 2003)
- all free-living birds and mammals (Sinclair et al. 2006)
- all free-living terrestrial vertebrates (Mills, 2007)
- all free-living animals (excluding feral or exotic species) of major significance to humans, including associated plants and lower animals (Krausman & Cain 2022)
- "...any member of the animal kingdom, including ... any mammal, fish, bird..., amphibians, reptile, mollusk, crustacean, arthropod or other invertebrate..." (ESA 1973)









## Hotter days could kill more desert songbirds

A warming climate could prove increasingly dehydrating for these birds ...

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YUSTINA A. KIWANGO, AND DOUGLAS T. BOLGER

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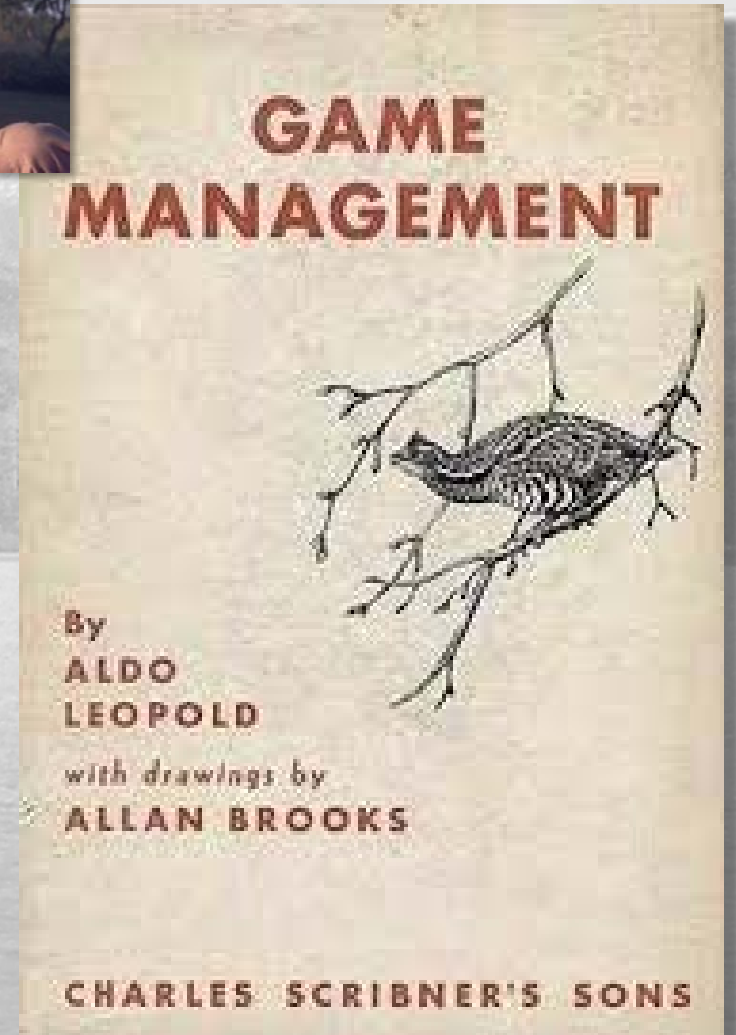
Roadless Initiative: "A global map of roadless areas and their conservation status" paper



# Wildlife management: evolution of the concept

Aldo Leopold (1933):

- wildlife management as “*the art of making land produce sustained annual crops of wild game for recreational use*”

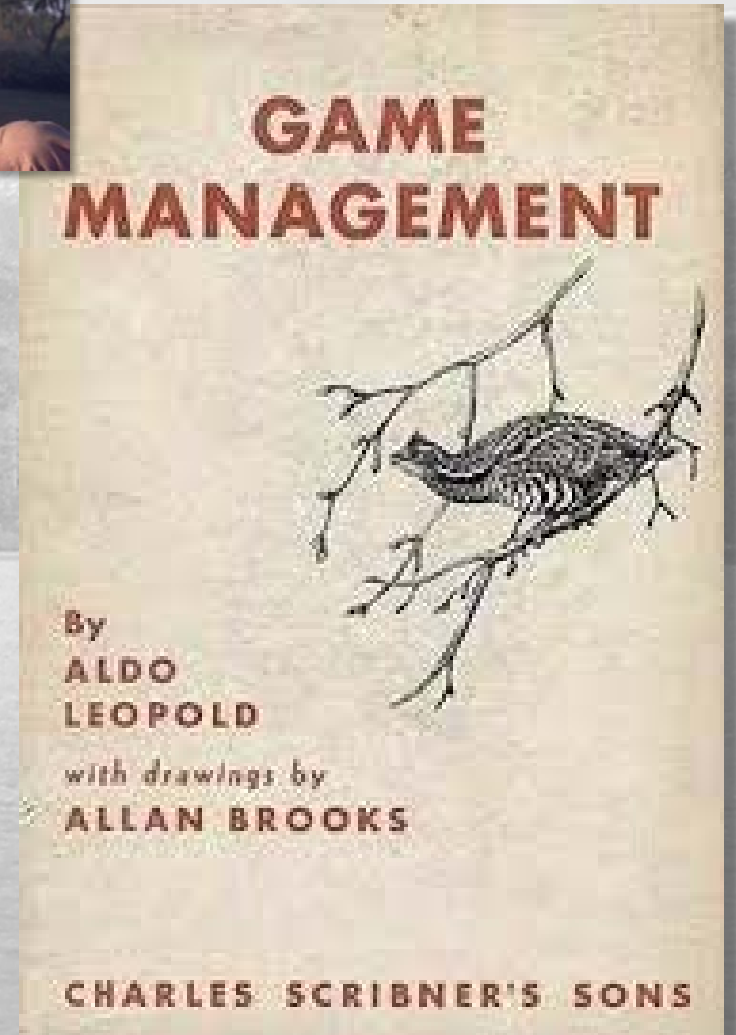




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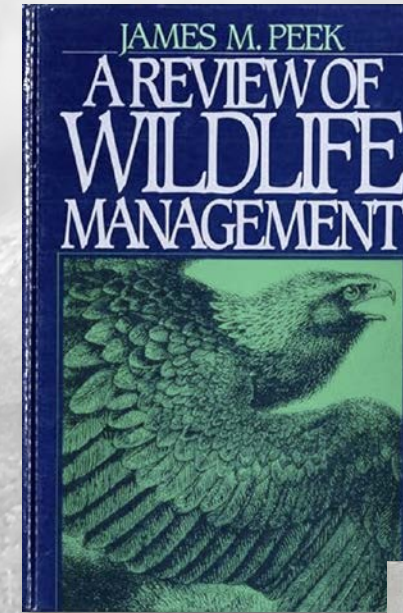




# Wildlife management: evolution of the concept

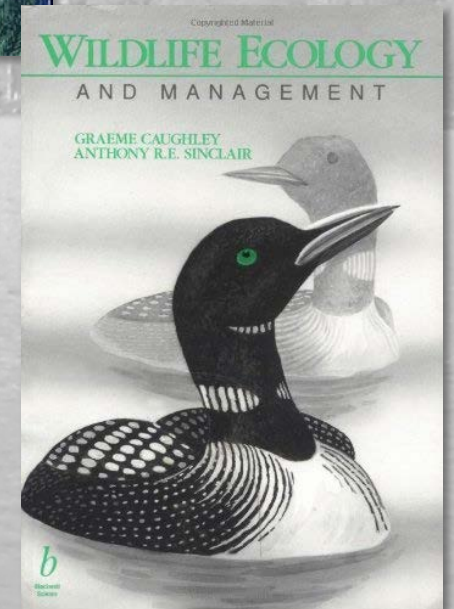
Shaw (1985):

- wildlife management as *the application of population biology principles to maintain, increase or reduce wildlife to meet specific management goals*



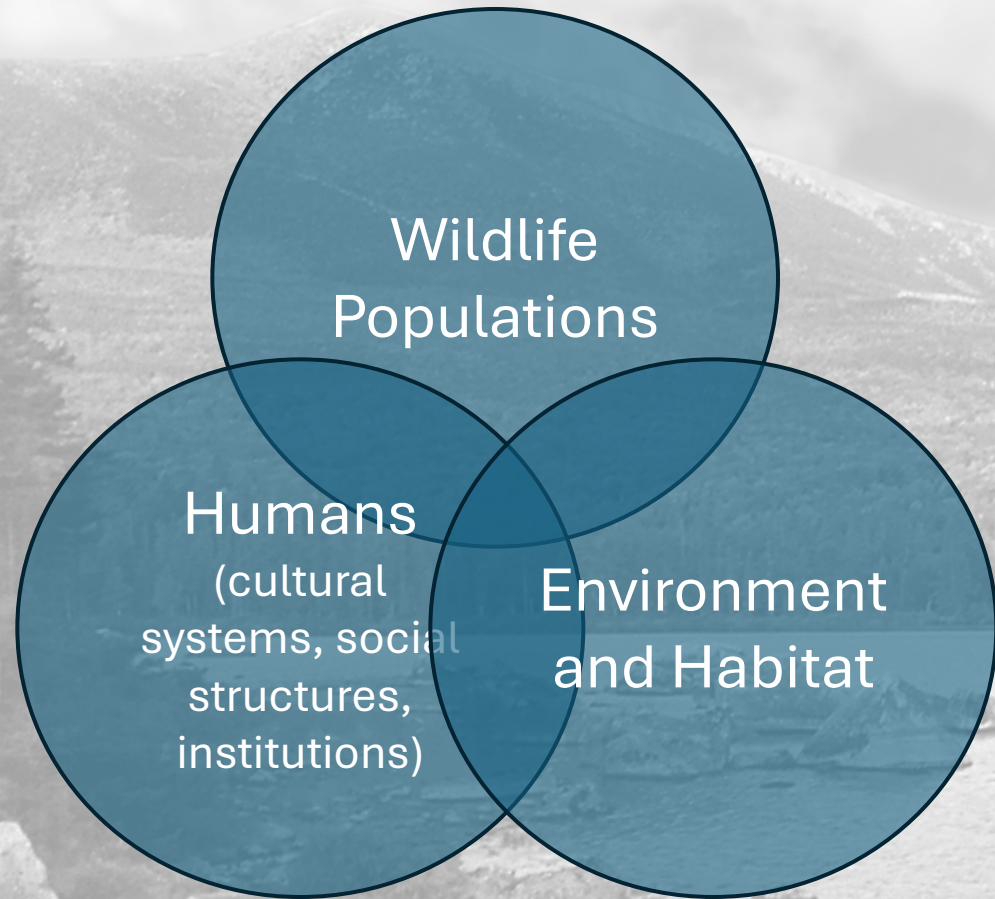
Peek (1986), Caughley & Sinclair (1994):

- wildlife management as *an applied science whose aim is to ensure that habitats support viable wildlife populations*





# Wildlife management: evolution of the concept



The Wildlife Management triad

Decker et al. (2001):

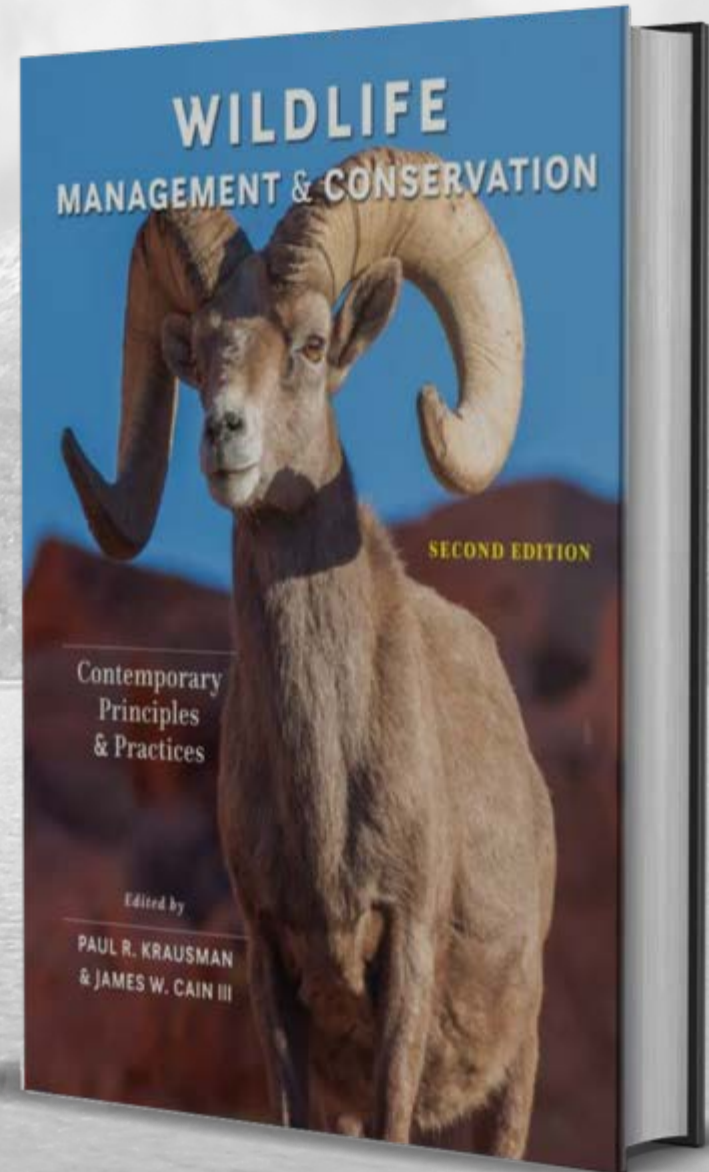
- Human Dimension “*how people value wildlife, how they want wildlife to be managed, and how they affect or are affected by wildlife and wildlife management decisions*”



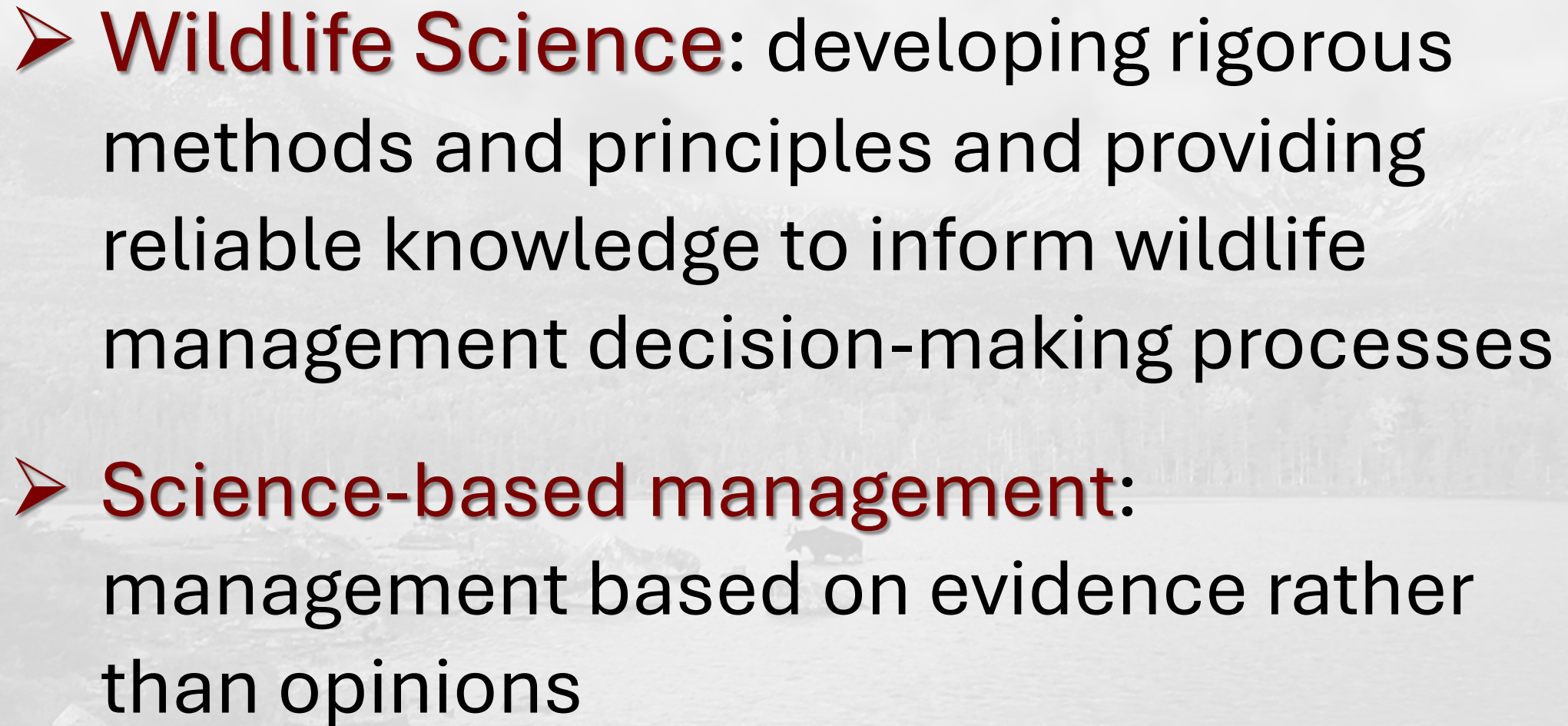
# Wildlife management: evolution of the concept

P.L. Krausman & J.W. Cain (2022):

- wildlife management as “*guidance of decision-making processes and implementation of practices to influence interactions between people, wildlife and wildlife habitats, and among people about wildlife, to achieve effects desired by stakeholders*”

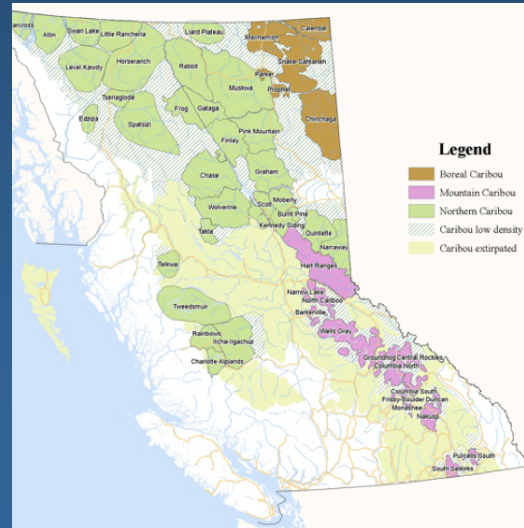




- 
- **Wildlife Science:** developing rigorous methods and principles and providing reliable knowledge to inform wildlife management decision-making processes
  - **Science-based management:** management based on evidence rather than opinions



# The decline of the mountain caribou (*Rangifer tarandus*)



- Habitat destruction?
- Climate change?
- Excessive predation?
- Competition?
- Human disturbance?



# Approaches to Wildlife Management





# Approaches to Wildlife Management

- *Active* – doing something
- *Inactive* –doing nothing
- *Passive* – doing nothing as a management decision



# Approaches to Wildlife Management

➤ Active management can act upon:

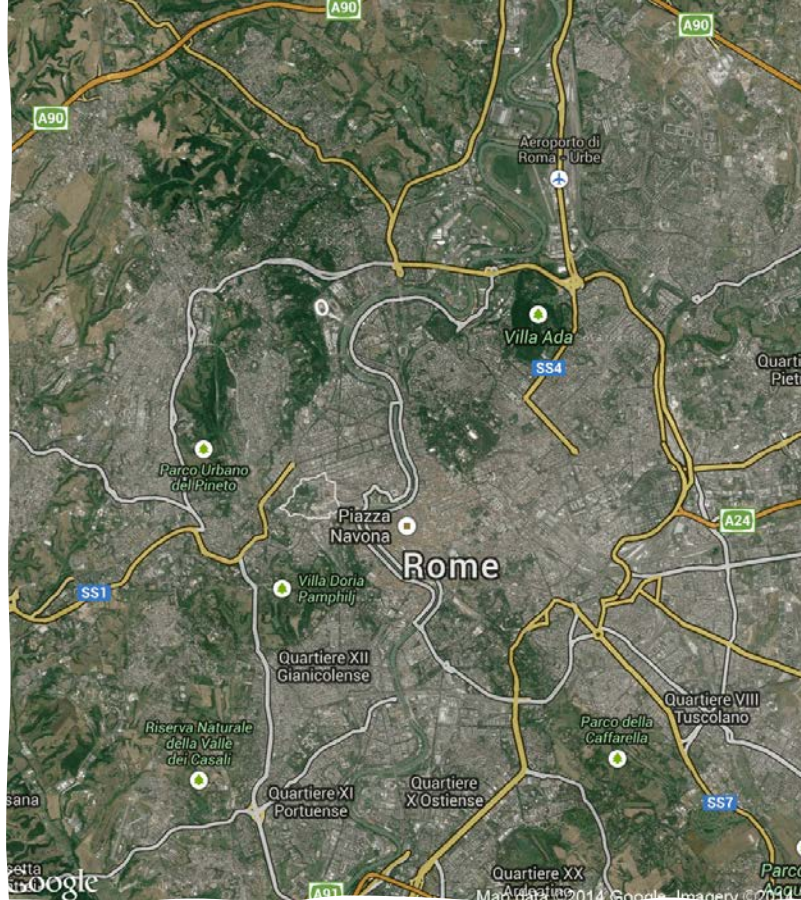
- *Populations*
- *Habitats*
- *Humans*

➤ The goal is always to achieve a *response* in *wildlife populations*

- *make the population increase*
- *make the population decrease*
- *ensure a sustainable harvest*
- *do nothing (but keep an eye on it)*







# Approaches to Wildlife Management

Should we act on:

- *the wild boar population?*
- *its habitat in the surrounding areas?*
- *human behaviour?*



# Wildlife management applications

## 1. Sustainable harvest (population and surplus maintenance)





# Wildlife management applications

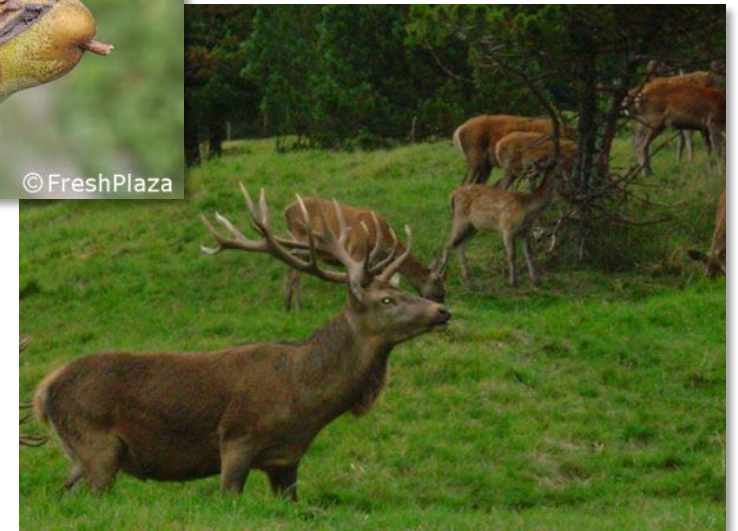
## 2. Control of alien, invasive species (population decline, eradication)





# Wildlife management applications

## 3. Prevention and mitigation of wildlife-human conflicts (reduce impact, enhance coexistence)





# Wildlife management applications

## 4. Conservation of threatened and endangered species (increase in population numbers and range)





# What 'conservation' is all about?

*tutelare le specie come parte integrante degli ecosistemi naturali, preservando i meccanismi evolutivi che ne hanno determinato l'affermazione e il continuo adattamento*







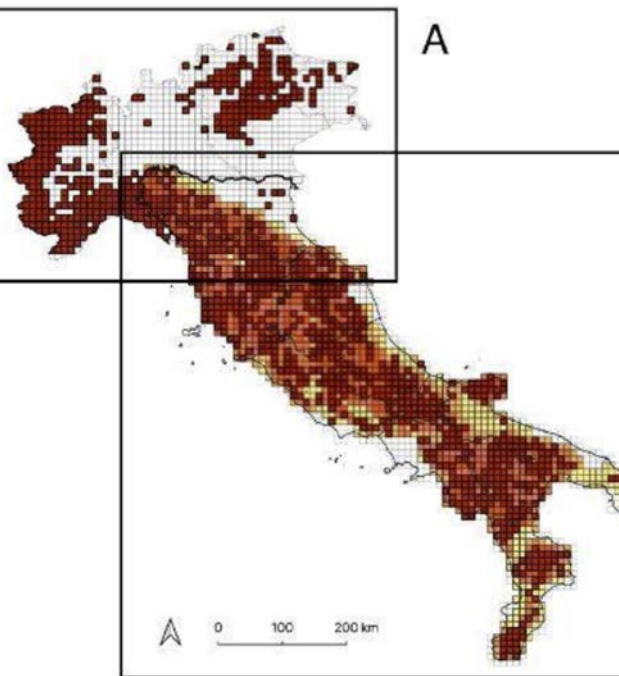
# ***Il Portale del Camoscio Appenninico***

LIFE Coornata: development of coordinated protection measures for  
Appennine Chamois LIFE09 NAT/IT/000183



<http://www.camoscioappenninico.it/>





- Legal protection (since 1971)
- Establishment of protected areas
- Wild prey reintroductions (since 1974)
- Countryside abandonment by humans due to urbanization
- Remarkable resilience by wolves
- ...



Wildlife management is complex,  
controversial and conflictual!





Wildlife management is complex,  
controversial and conflictual!





# Wildlife management is conflictual!

- Lack of governance generates polarization and enhances social conflicts
- Decision-making should be *science-based, transparent, participatory*
- ‘Wildlife experts’ should not surrogate for policy!

Servizio | Il referendum consultivo



## Referendum consultivo in Trentino: Val di Sole contro gli orsi bruni (98%)

A un anno e mezzo dall'uccisione di Andrea Papi da parte dell'orsa JJ4, il voto consultivo di 13 Comuni bocchia il progetto di ripopolamento

di Enrico Marro

28 ottobre 2024



<https://www.ilsole24ore.com/>



# Wildlife management and Ethics

Human – non-human animal relationship:

- ❖ the definition of management goals
  - e.g., should human interests prevail over ecological integrity?
  - e.g., should human interests prevail over animal welfare?
  - e.g., should we eradicate alien species?





# Wildlife management and Ethics

Human – non-human animal relationship:

## ❖ the appropriateness of management interventions

- *e.g., should we reduce wildlife populations through lethal control?*
- *e.g., should we reduce human-wildlife conflict through predator removal?*
- *e.g., should we sustain higher hunting yields by artificial feeding?*



Policy and regulation Research Digital Innovation

## How to control the overabundance of specific wildlife species in national parks?

**Survey: 95% agree on need to control damage caused by hoofed mammals in national parks - the question is how?**

📅 27 September 2023 ⌚ 5 minute read 👤 By: Institute for Game and Wildlife Research (IREC)

🌍 Europe 🌍 Africa 🌍 South America 🌍 North America

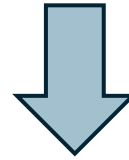


Who takes part in  
the decision-  
making process?

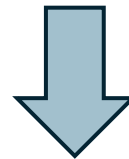
Decision-making  
processes

- Wildlife managers
- Practitioners
- Wildlife agencies
- NGOs
- ...

Management Goals



Management actions



Monitoring

- Attitudes
- Traditions
- Cultural values
- Legal & political system
- ...

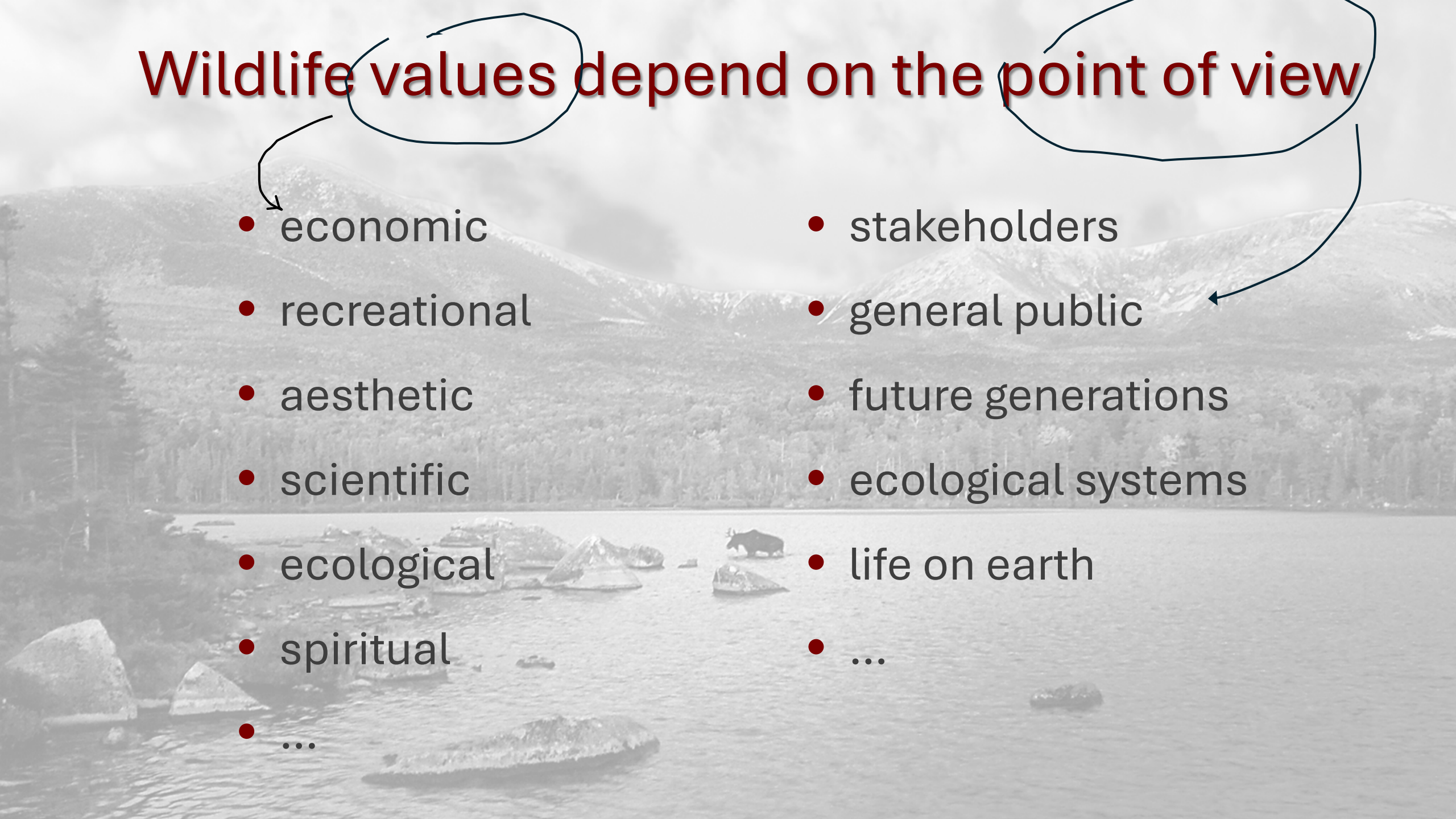
Wildlife  
Science

- assesses feasibility
- evaluates alternatives
- designs strategy
- informs the process

Is wildlife management  
working?



# Wildlife values depend on the point of view

- 
- economic
  - recreational
  - aesthetic
  - scientific
  - ecological
  - spiritual
  - ...
  - stakeholders
  - general public
  - future generations
  - ecological systems
  - life on earth
  - ...



# Wildlife management is complex, controversial, and conflictual

“L'Italia è uno dei paesi più  
depressi, tra quelli civili, in  
fatto di cultura naturalistica”

Alessandro Ghigi (1951)



# Wildlife management is complex, controversial, and conflictual

- Wildlife Management is a highly social and political issue and conservation issues may become very emotional and controversial. Don't be scared away, **be faithful to science** and empowered by your connection with nature and wildlife. Society (and biodiversity) needs you.
- The complexity and vastness of the current biodiversity crisis may make you walk away. Yet, think that **knowledge is the foundation for change** and wildlife conservation is a fundamental piece of the puzzle.