

# Animal Economics

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8 December 2025

Thanks to ANR-24-CE26-2813-02 (SentientBCA)

"The best discussion, by far, of how to explore animal welfare with the help of economics. Careful and rigorous analysis, produced with palpable moral conviction. This is a sensational achievement."

CASS R. SUNSTEIN, Robert Walmsley Professor, Harvard University,  
and author, *Manipulation*



"Nicolas Treich has been a pioneer in animal welfare economics, and this book is a masterpiece that will put this field on solid grounds. There are many conceptual and empirical difficulties in the integration of non-human species into welfare economics, and this book proposes brave innovative ideas and develops useful tools for the analysis of policies, norms and behaviors that often dramatically impact our fellow living creatures. An excellent reference for students, researchers, and experts engaged in advocacy and policy-making."

MARC FLEURBAEY, Paris School of Economics, CNRS, and ENS-PSL



"Academic, governmental, and public concern for the well-being of animals has increased enormously over the last half-century, and yet economics has generally limited its focus to human beings. Nicolas Treich is a world leader in the effort to bring animals within the ambit of welfare economics. It's ethically arbitrary, indeed unconscionable, for this discipline's powerful tools to be harnessed to the narrow objective of maximizing human well-being. This book synthesizes and makes accessible Treich's path-breaking research on how welfare economics can be reoriented to take account of all sentient animals, not just humans."

MATTHEW ADLER, Richard A. Horvitz Professor of Law and Professor of Economics, Philosophy, and Public Policy, Duke University



TREICH

Animal Economics

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Directly and Indirectly  
Accounting for  
Animal Welfare

NICOLAS TREICH

 CAMBRIDGE  
UNIVERSITY PRESS

ISBN 978-1-009-69934-1



CAMBRIDGE

# Outline

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- **Part 0. Preliminaries**
- **Part 1. Direct approach: Animals matter intrinsically**
  - **Core idea:** Animals are directly included in the **social welfare function**.
  - **Key economic issue:** Externalities on animals.
  - **Conceptual challenges:**
    - Multispecies social welfare function
    - Population ethics
    - Measuring animal welfare and comparing welfare across species
- **Part 2. Indirect approach: Animals matter through humans**
  - **Core idea:** Animals are included via humans' **preferences** (e.g., altruism).
  - **Key economic issue:** Public goods and behavioral issues.
  - **Conceptual challenges:**
    - Understanding pro-animal concerns
    - Understanding the role of markets and institutions



# Counting Animals

We have very precise data from the FAO on the number of farmed animals.

In contrast, less is known about the number of wild animals. *“Attempts to assess the magnitude of global biodiversity have focused on estimating species richness. The total number of individual organisms in the world [...] has been a largely ignored statistic.”* Gaston and Blackburn (1997)

## Orders of magnitude (see the book for refs):

Wild birds: ~ 100 billion

Wild mammals: ~ 85 billion

Marine mammals: ~ 20 million

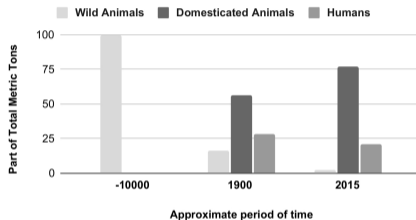
Wild fish: ~ 200 trillion

Reptiles: ~ 1 trillion

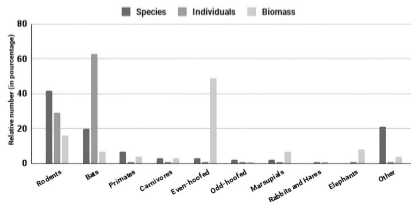
Amphibians: ~ 1 trillion

Insects: Orders of magnitude above, ~  $10^{18}$

## Estimated biomass of all land animals



## Relative number of species, number of individuals, and total biomass of each taxonomic order of wild land mammals



# A non-anthropocentric social welfare function

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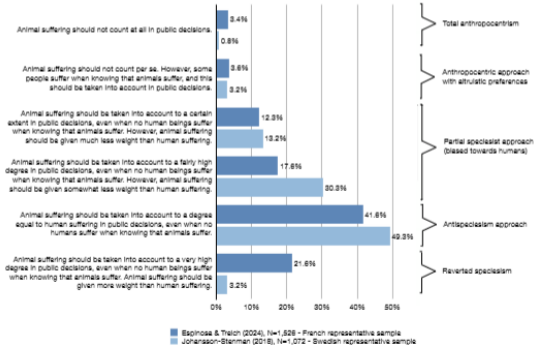
$$\text{SWF} = \sum_{i=1}^{N_h} g_h(u_{hi}) + \sum_{s=1}^S \sum_{j=1}^{N_s} a_s \beta_{sj} g_s(u_{sj}) \quad (1)$$

- $N_h$  = number of humans;  $N_s$  = number of animals in species  $s$ ;  $S$  = total number of species.
- $u_{sj}$  = utility of animal  $j$  in species  $s$ ,
- $u_{hi}$  = utility of human  $i$ , given by  $u_{hi} = m_{hi} + \sum_{s=1}^S \sum_{j=1}^{N_s} \alpha_{isj} u_{sj}$ , where  $\alpha_{isj}$  captures  $i$ 's altruism toward animal  $j$  in species  $s$ , and  $m_{hi}$  is material utility. INDIRECT APPROACH.
- $a_s$  = moral weight of species  $s$ ;  $\beta_{sj}$  = adjustment for individual animal  $j$ .
- $g_h, g_s$  = transformation functions of human and animal utilities, possibly species-specific (if  $g_h(u) = g_s(u) = u$ : total utilitarianism)

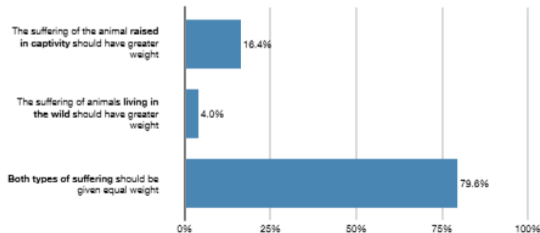
# A survey study about moral beliefs

Questions about how much weight society should place on reducing animal suffering compared to the "same amount of suffering" in humans (or in other animals)

**Question:** Society can reduce animal as well as human suffering through various, usually costly, measures. To be able to prioritize, we need to know how great a weight society should place on reducing suffering in an animal (such as a cow) compared with reducing an equal amount of suffering in a human. Which of the following statements is most in accordance with your opinion regarding the weight that should be given to animal suffering in public decisions?



**Question:** Now imagine that society faces a situation where it can reduce the same amount of suffering in two animals of the same species. We assumed that these two animals experience the same living conditions today. One of the animals is raised in captivity while the other animal lives in a wild environment. How much weight should we give to the suffering of these two animals?



# A new method to assess animal welfare

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We calibrate animal welfare through a general formula:

$$u_{sj} = \phi_s \int_0^T q_{sj}(t) dt$$

$q_{sj}(t)$ : **animal welfare score** at time  $t$  of animal  $j$  in species  $s$  between birth ( $t = 0$ ) and death ( $t = T$ )

Estimated using the Five Freedom/Domain approach on a 0-1 range. Similar to QALYs for humans.

$\phi_s$ : **utility potential** of species  $s$  (permits to make interspecies comparisons)

Estimated using the number of forebrain neurons per animal species.

Remark: Monetization possible by translating utility levels into monetary units

Estimated using the human WTP per QALY.

Source: Based on Budolfson and Spears (2020), Espinosa (2024), Espinosa and Treich (2024)

# Compassionate conservation

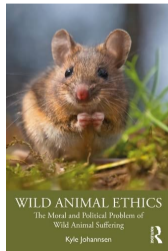
- Integrates **animal welfare** into conservation = Promotes the **quantity and the quality** of individual animal lives
- **Additional biodiversity benefits** when protecting sentient species (Webb et al. 2019, Sekar and Shiller 2020)
- BUT raises strong **ethical issues**:
  - The welfare costs of **eradication policies**
  - **Life (not) worth living**. When wild lives involve intense suffering, should we reduce conservation efforts? (Ng 1995; Horta 2010). Should we even attempt to **reduce predation**? (Johannsen 2020)
  - **Fallibility argument**: human intervention in Nature risks causing more harm than good.
  - Delon and Purves (2018): we need *“models that predict the effects of interventions on biodiversity, ecosystem functioning, and animals’ well-being.”*



CONSERVATION

## Engage with animal welfare in conservation

Conservation could better promote not just the quantity of species but the quality of animal life



# Project Isabela: Conservation vs. animal welfare

**Project Isabela** (1997) in the Galápagos is considered one of the most successful invasive-species eradication programs ever conducted

**Achieved objective:** Restore ecosystems for giant tortoises

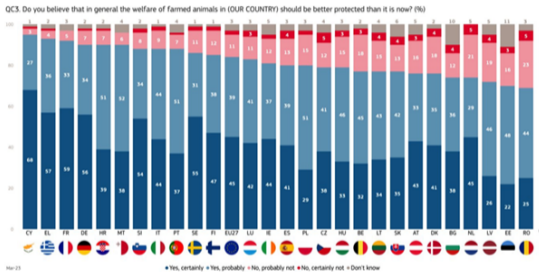
**Impact:** It killed at least 140,000 goats, 18,000 pigs, and 1,000 donkeys using aerial and ground hunting, trained dogs, and “Judas goats”

**Welfare costs:** very large: **over €2.7 billion**, far exceeding the project’s financial cost of US\$10.5 million



Animals	Number killed	Life exp. loss (yrs)	AW score	Utility potential	Utility loss (€)	Cost per species (M€)
Goats	140,000	6	1	0.020	17,520	2452.8
Pigs	18,000	4	1	0.022	12,848	231.2
Donkeys	1,000	10	1	0.032	46,720	46.7

# People care about animal welfare

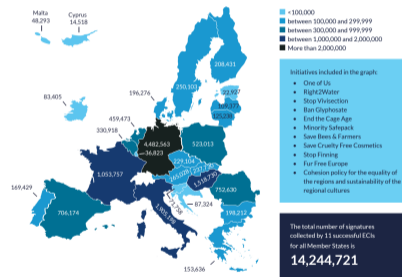


A large majority of Europeans would want animal welfare to be better protected

## EUROPEAN CITIZENS' INITIATIVES - SIGNATURES

Signatures collected by 11 successful ECIs (2012 - 2025)

Total verified signatures by Member State



Citizens support initiatives about animal welfare

# An open question: Why do we care about animals?

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## Humans: Established explanations

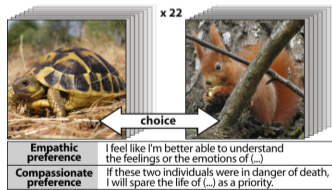
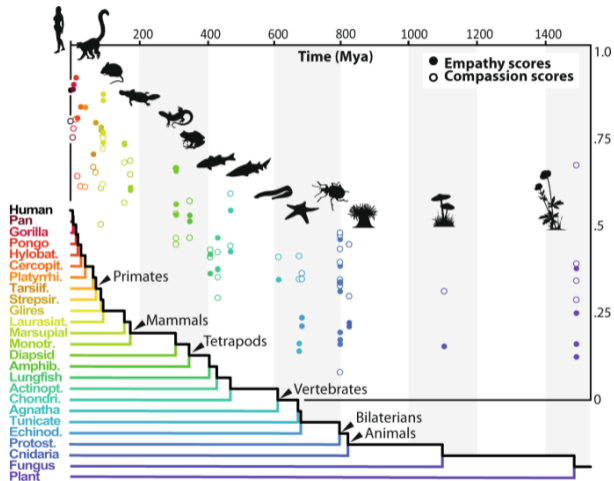
- Kinship
- Reciprocity
- Reputation

## Animals: Origins less clear

- Spillover from concern for infants
- Cooperation
- Self- or social-signaling
- Social norms



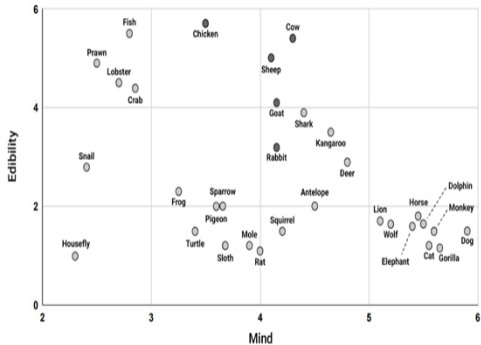
# Empathy and compassion depends on evolutionary distance



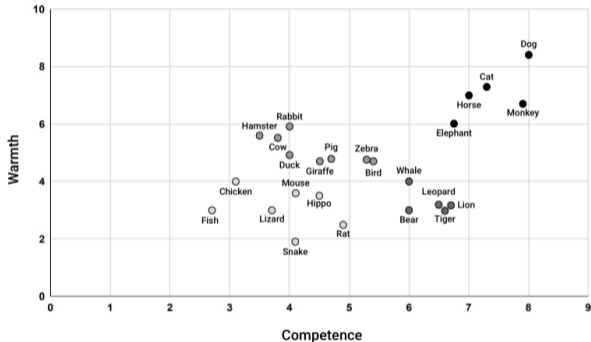
Source: Miralles et al. (2019)

# Human perceptions of animals

Perceptions of animals' edibility and cognitive ability



Perceptions of animals' warmth and competence

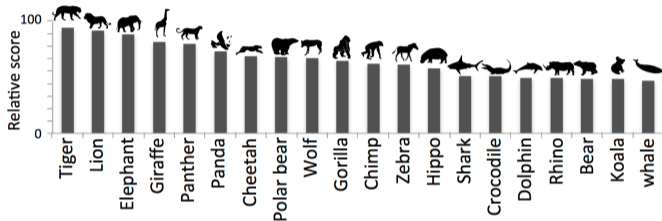


Bastian et al. (2012). Farmed animals are perceived as less intelligent than wild or companion animals.

Sevillano and Fiske (2016). People describe groups of animals as they describe groups of humans. Outgroup/ingroup theory.

# Emblematic species in conservation

Certain species, often charismatic megafauna, receive a disproportionate share of attention and funding in conservation policies (Albert et al. 2018):



## Key insights from contingent valuation studies:

- Decisions under the Endangered Species Act place higher weight on proxies such as charisma and public visibility, while factors like biodiversity value, and cost are comparatively neglected (Metrick and Weitzman 1998)
- Affective factors dominate over ecological criteria. Familiarity with species strongly increases WTP for conservation (Martin-Lopez et al. 2007)

## Ineffective altruism in conservation [Tentative conclusion]

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**Warm glow.** Refers to the personal satisfaction or emotional reward people feel when they do something good, regardless of how effective that action actually is.

**Scope insensitivity.** People do not scale their help with the number of animals affected (e.g., similar WTP to save 2,000, 20,000, or 200,000 birds from oil spills; Desvousges et al. 2010).

**Anthropomorphism and anthropodenial.** Humans sometimes over-attribute emotions to animals, and at other times deny obvious similarities (De Waal 1999)

**Romantic view of Nature.** Belief that Nature is harmonious. Likely underestimation of wild animal suffering.

**Localism.** People feel good protecting a nearby forest or species, even if protecting a tropical hotspot would save  $100\times$  more biodiversity.

**Possible over-focus on endangered species.** A simpler narrative (rather than focusing on ecosystems' resilience, deforestation, meat eating etc.) that triggers "extinction panic", creates an illusion of efficacy (e.g., saving a "doomed" species), and reflects proportion dominance (e.g., saving 1/10 lives is preferred to saving 1/100 lives; Bartels 2016).

**Merci !**

Questions ?

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