

## Why is Biodiversity Important? An Oral Communication Exercise

Author(s): Eleanor J. Sterling, Romi L. Burks, Joshua Linder, Tom Langen, Denny S. Fernandez, Douglas Ruby, and Nora Bynum

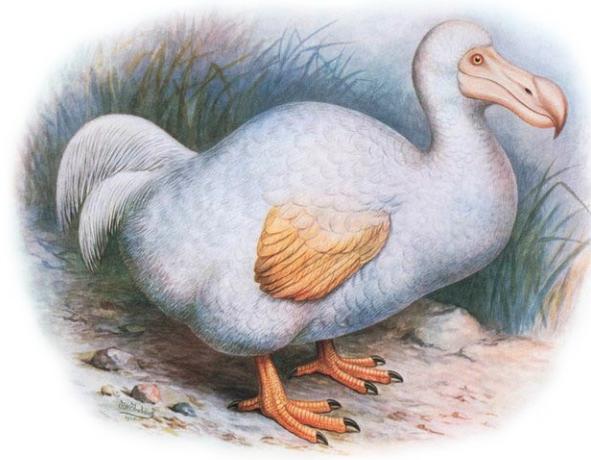
Source: *Lessons in Conservation*, Vol. 8, Issue 1, pp. 11–13

Published by: Network of Conservation Educators and Practitioners, Center for Biodiversity and Conservation, American Museum of Natural History

Stable URL: [ncep.amnh.org/linc/](http://ncep.amnh.org/linc/)

---

This article is featured in *Lessons in Conservation*, the official journal of the Network of Conservation Educators and Practitioners (NCEP). NCEP is a collaborative project of the American Museum of Natural History's Center for Biodiversity and Conservation (CBC) and a number of institutions and individuals around the world. *Lessons in Conservation* is designed to introduce NCEP teaching and learning resources (or “modules”) to a broad audience. NCEP modules are designed for undergraduate and professional level education. These modules—and many more on a variety of conservation topics—are available for free download at our website, [ncep.amnh.org](http://ncep.amnh.org).



---

To learn more about NCEP, visit our website: [ncep.amnh.org](http://ncep.amnh.org).

All reproduction or distribution must provide full citation of the original work and provide a copyright notice as follows:

“Copyright 2018, by the authors of the material and the Center for Biodiversity and Conservation of the American Museum of Natural History. All rights reserved.”

Illustrations obtained from the American Museum of Natural History's library: [images.library.amnh.org/digital/](http://images.library.amnh.org/digital/)



# Why is Biodiversity Important? A Research and Oral Communication Exercise

Eleanor J. Sterling,<sup>1</sup> Romi L. Burks,<sup>2</sup> Joshua Linder,<sup>3</sup> Tom Langen,<sup>4</sup> Denny S. Fernandez,<sup>5</sup> Douglas Ruby,<sup>6</sup> and Nora Bynum<sup>1</sup>

<sup>1</sup>American Museum of Natural History, New York, NY, USA; <sup>2</sup>Southwestern University, Georgetown, TX, USA; <sup>3</sup>James Madison University, Harrisonburg, VA, USA; <sup>4</sup>Clarkson University, Potsdam, NY, USA; <sup>5</sup>University of Puerto Rico at Humaco, Humaco, Puerto Rico; <sup>6</sup>University of Maryland Eastern Shore, Princess Anne, MD, USA

## ABSTRACT

The main objective of this exercise is for students to understand why biodiversity is important. Students will conduct some bibliographic research to assess the value of a particular species and will then share these findings in class by giving a five minute presentation.

## 1. PART 1: INTRODUCTION

### 1.1. Background<sup>1</sup>

Biodiversity, a contraction of the phrase “biological diversity,” is a complex topic, covering many aspects of biological variation. In popular usage, the word “biodiversity” is often used to describe all the species living in a particular area. If we consider this area at its largest scale—the entire world—then biodiversity can be summarized as “life on earth.” However, scientists use a more comprehensive definition that considers its many hierarchical levels, and the processes that generate and maintain it. Thus, biodiversity can be considered to comprise the variety of life on Earth at all its levels, from genes to ecosystems, and the ecological and evolutionary processes that sustain it.

Humans depend upon biodiversity in many ways, both to satisfy basic needs like food and medicine, and to enrich our lives culturally or spiritually. Yet in an increasingly modern, technological world, people often forget how fundamental biodiversity is to daily life and are unaware of the impact of its loss.

Values are also dynamic; they change over time and vary according to specific situations. Both the range of values towards a species and the changes in values

over time can be examined in the case of the gray wolf (*Canis lupus*) in the United States. As of the early 1600s, gray wolves were widespread and abundant in North America. Around that time, European colonists, who deemed wolves a threat to human livelihoods, began systematically hunting and eradicating them. In the 1800s, this practice was formalized in US Federal and State government predator control programs, which included the use of bounties. This hunting and trapping pressure, along with habitat loss and degradation and loss in prey base, resulted in wolves being virtually exterminated from the lower 48 states by the early 1900s. But in the late 1970s, in sharp contrast to earlier views of wolves, the US government began programs to restore them to their former range. To some people, wolves have come to signify the wilderness and in some areas, have become an important tourist attraction (such as Yellowstone National Park and in northern Minnesota). Others still view wolves as a threat. The debate over wolf restoration programs demonstrates not only the changes in values but also the multiplicity of values within any one society (Lynn 2002, USFWS 2011).

The value of biodiversity is often divided into two main categories:

- Utilitarian (also known as anthropocentric) value, and
- Intrinsic (also known as biocentric) value.

<sup>1</sup>Background information in this exercise is based on Laverty, M.F., E.J. Sterling, E.A. Johnson, E. Vintinner, and B.C. Weeks. 2008. *Why is Biodiversity Important?* Synthesis. Network of Conservation Educators and Practitioners, American Museum of Natural History. Available from [ncep.amnh.org](http://ncep.amnh.org)



### 1.1.1. Utilitarian Value

The *utilitarian value* of living things is determined by its use or function. Usually utilitarian value is measured in terms of its use for humans (anthropocentric), such as for medicine or food. However, it can also represent the value of an organism to other living things or its ecological value. For instance, pollinators, such as bees, are essential to the reproduction of many plants.

Economists typically subdivide utilitarian values of biodiversity into *direct use value* for those goods that are consumed directly, and *indirect use value* for those services that support the items that are consumed, including ecosystem functions (Table 1).

### 1.1.2. Intrinsic Value

In contrast to the utilitarian value, the *intrinsic* or *biocentric value* describes the inherent worth of an organism, independent of its value to anyone or anything else. In other words, all living things can be considered valuable because they have a right to exist, regardless of their utilitarian value (Cafaro and Primack 2014, Soulé 2013, Soulé 1985).

However, determining the value or worth of biodiversity is complex and often a cause for debate. This is largely due to that fact that the worth placed on biodiversity is a reflection of underlying human values, and these values vary dramatically both among societies and individuals (Perlman and Adelson 1997, Karp et al. 2015, Millennium Ecosystem Assessment 2005). The perspective of rural versus urban dwellers towards wildlife is one example.

People who don't live with elephants on a daily basis appreciate elephants for their sheer size, charisma, and intelligence. Those who live near elephants, however, sometimes perceive them as a threat to people and their crops and property (Desai and Riddle 2015, Redpath et al. 2013).

Considering the value of biodiversity raises important but complex questions, such as:

- Do we, as a society, bear an obligation to act as responsible stewards of other species?
- Should we conserve species for the present or the future values (potential value) that they contribute to humans?
- What importance should be given to biodiversity conservation in the context other societal concerns?

## 2. PART 2: INVESTIGATING WHY SPECIES ARE IMPORTANT

Your task is to prepare a *five minute oral presentation* that assesses the value or importance of a particular species. You will be expected to present your findings in class in no more than five minutes and use visual aids.

To complete this assignment, you will need to research information available in the literature about your assigned species and assess its value. At least four of the bibliographic sources you use need to be reliable, such as peer-reviewed journals, refereed books or book chapters, and authorized databases (e.g., International Union for Conservation of Nature (IUCN) website). You

Table 1. Categories of utilitarian values of biodiversity

| UTILITARIAN VALUE                     | EXAMPLES  |
|---------------------------------------|---|
| <b>Direct use values (goods)</b>      | Food, medicine, building material, fiber, fuel  |
| <b>Indirect use values (services)</b> | <i>Ecological value:</i> atmospheric and climate regulation, pollination, nutrient recycling.<br><i>Cultural, Spiritual, and Aesthetic value*</i> |
| <b>Non-use values</b>                 | Potential value; <sup>a</sup> existence value; <sup>b</sup> bequest value <sup>c</sup>  |

\*Some authors choose to differentiate these values from those services that provide basic survival needs such as the air we breathe.

<sup>a</sup>Potential value: future value either as a good or service

<sup>b</sup>Existence value: value of knowing something exists

<sup>c</sup>Bequest value: value of knowing that something will be there for future generations



must provide the references on your presentation. If you are not sure about what “reliable sources” means, please ask your instructor.

In your presentation, you must include:

1. A description of where your species fits within the tree of life (that is, how is it classified taxonomically).
2. A description of the range. Is it a common or rare species within its range?
3. Is this species endemic to a particular area or region?
4. Is this a threatened species? Explain how it ranks in threat level using the IUCN criteria and why.
5. What are the known threats the species faces and what are the potential threats this species may face in the future?
6. In what ways can this species be considered valuable? *Remember that this should constitute the major focus of your presentation.*
7. A list of valid references.

Your instructor will provide a list of species and assign you one of those species on which to present. When constructing your presentation, assume your audience knows very little about the natural history of your species. So, make sure you provide key information to introduce your assigned species.

You will be evaluated on your understanding of the subject, selection, and use of supportive evidence as well as organization. In addition, delivery, use of visual aids and text, and timing will also be considered. For further details, please see the evaluation rubric provided for oral presentations (See: *Sharpen your oral communication skills!*, Appendix 1, in this Issue).

## REFERENCES

- Cafaro, P., and R. Primack. 2014. Species extinction is a great moral wrong. *Biological Conservation* 170:1–2.
- Desai, A.A., and H.S. Riddle. 2015. Human-elephant conflict in Asia. US Fish and Wildlife Service, Washington, DC, USA, and Asian Elephant Conservation Fund, St. Louis, MO, USA. Available from <https://www.fws.gov/international/pdf/Human-Elephant-Conflict-in-Asia-June2015.pdf>.
- Karp, D.S., C.D. Mendenhall, E. Callaway, L.O. Frishkoff, P.M. Kareiva, P.R. Ehrlich, and G.C. Daily. 2015. Confronting and resolving competing values behind conservation. *Proceedings of the National Academy of Sciences* 112:11132–11137.
- Laverty, M.F., E.J. Sterling, E.A. Johnson, E. Vintinner, and B.C. Weeks. 2008. Why is Biodiversity Important? Synthesis. Network of Conservation Educators and Practitioners, Center for Biodiversity and Conservation, American Museum of Natural History, New York, NY, USA. Available from <http://ncep.amnh.org>.
- Lynn, W. S. 2002. *Canis lupus cosmopolis*: wolves in a cosmopolitan worldview. *Worldviews* 6:300–327.
- Millennium Ecosystem Assessment. 2005. Ecosystems and human well-being: biodiversity synthesis. World Resources Institute, Washington, DC, USA. Available from <https://www.millenniumassessment.org/documents/document.354.aspx.pdf>.
- Perlman, D.L., and G. Adelson. 1997. *Biodiversity: Exploring Values and Priorities in Conservation*. Blackwell Science, Malden, MA, USA.
- Redpath, S.M., et al. 2013. Understanding and managing conservation conflicts. *Trends in Ecology and Evolution* 28:100–109.
- Soulé, M.E. 1985. What is conservation biology? *BioScience* 35:727–734.
- Soulé, M.E. 2013. The “new conservation.” *Conservation Biology* 27:895–897.
- [USFWS] US Fish and Wildlife Service. 2011. Gray wolf (*Canis lupus*) biologist. US Fish and Wildlife Service, Midwest Region, USA. Available from <https://www.fws.gov/midwest/wolf/aboutwolves/biologue.htm> (accessed January 2018).