Chapter 2

Introduction

What we are talking about: "Ecology"?

Different scales:

- Population ecology: sets of populations made of interacting individuals of the same or different species

- Community: set of interacting species

- Ecosystem: community + habitat factors

From which point of view?

- Difference between:

  (1) Foundations of the science of ecology

  (2) Environmental Ethics

  (3) Conservation and environmental policy

  We will focus on (1) – philosophical foundations of ecology – because while (2) is obviously of primary importance, the philosophical investigation of (1) is a crucial prerequisite before one can address (2).

- What is the study of the foundations of the science of ecology? A branch of the philosophy of the special sciences:

  - neither concerned with the ethical issues related to the application of biological sciences,

  - nor simply translation project (popular science).

  Rather: better understanding of the science itself:

  - Methods

  - Concepts

Issues we are interested in:

- Balance of Nature:

  Intuitive notion of the balance of nature: equilibrium + stability, i.e. persistance / restauration under disturbances – e.g. restoration of forest community after fire.

  Questions:

  1. Can we make this notion more precise?:

  - Notion of equilibrium / Notion of disturbances – problem of definition

  2. Are communities in equilibrium most of time? What about non-equilibrium ecology?

  3. Is equilibrium desirable and if so why?

- Diversity-Complexity/Stability hypothesis:

  "As the diversity or complexity of a community increases, so does the stability of the community"

  Is it true? The hypothesis is at least controversial. It all depends on how we define the notions of diversity / complexity and stability. As the hypothesis may inform policy decisions, it is crucial to clarify the matter!

- Ecological Models, Laws and Explanations:

  – Ecological modeling:

    - Are there general patterns in ecology? Historical character and contingency + complexity.

    - Problem with testability and predictive success: model uncertainty and difficulties linked to testing.

    Success assessment: is predictive success all there is to modeling?

  – Laws:

    - Are there ecological laws? Compare with physics!

  – Explanations? Requirements:

    Explanans = true law. Probably not. Then what else?

    Explanans = underlying (biological?) mechanism. Regress.

    Then what else? Can ecological models be explanatory and if so in what sense?

- Biodiveristy: What is it? Should we value it? And if so, why?

- Biodiversity as an index vs Biodiversity as a value in itself : descriptive vs normative

- Biodiversity as an index for some other property (stability, medicinal value etc.): question of reliability.

- Biodiversity as value: question of the sources of such value: intrinsic vs instrumental

- Existence and robustness of communities:

  (1) Clements: communities as super-organism

  (2) Gleason: communities as aggregate of species at particular places and times

  Problem: (2) does not exist objectively.

  Can we make sense of (1)? How?

  One of many problems: fluctuating boundaries

  One possible answer: causal interactions?

Conclusion:

Foundations of ecology as crucial to both environmental ethics and conservation issues.

Foundations of ecology as the way to better understand the science of ecology.

Limitations: are we to find definite answers?