

# **The Land Is Our Community: Aldo Leopold's Environmental Ethic for the New Millennium**

## **CHAPTER 4: LAND HEALTH**

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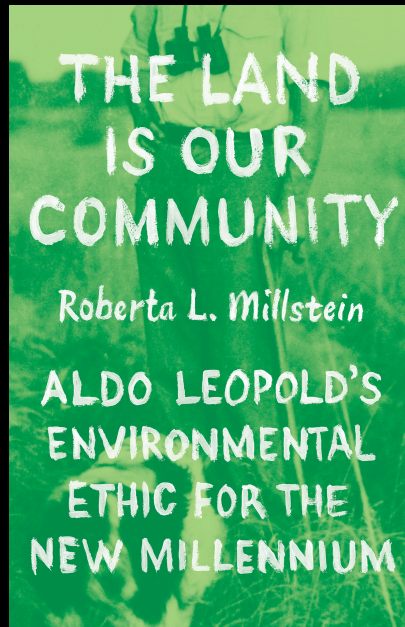
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***Have you watched the Introduction video yet?***

This video assumes that you have,  
so please go back and watch it first  
if you haven't done so yet!



## Summary statement of the land ethic

### Reminder:

In addition to the obligations that we already have toward other human individuals and to our human communities, act so as to **protect and promote the capacity of land communities** (soils, waters, plants, and animals, understood collectively) **for self-renewal**, i.e., their **health**, implying respect for both community members and the community as a whole.



*From A Sand County Almanac*

What does it mean to preserve land communities—  
what are we trying to preserve?

Leopold's answer: ***stability/land health***

But what does that mean?



## What is stability?

By **stability**, Leopold did *not* mean “unchanging” or even “dynamic equilibrium”:

- Leopold studied and described changing ecosystems, e.g., effects of fire and drought (Meine 2010).
- And he often contrasted slow, mild changes that land communities could adjust to, with rapid and drastic changes that they could not adjust to.

Rather than equating stability with “unchanging,” Leopold uses **stability** essentially interchangeably with **land health** (Warren 2013).

The Dust Bowl epitomizes loss of land health (sickness):

“...*when soil loses fertility, or washes away faster than it forms, and when water systems exhibit abnormal floods and shortages, the land is sick.*” (Leopold 1949, 194)



Dust Bowl. Arthur Rothstein, Wikipedia.

## Why land health?

Among the experiences that convinced Leopold to think in terms of land health was a trip to Chihuahua, Mexico in 1937.

Leopold was **struck by the similarities & differences** between:

- the **Sierra Madre** just over the U.S. border in Mexico
- the **mountains in the southwestern U.S.**, where he'd lived for a number of years

A natural experiment?

“It was here that I first clearly realized that land is an organism, that all my life I had seen only sick land, whereas here was a biota still in **perfect aboriginal health**. The term ‘**unspoiled wilderness**’ took on a new meaning” (Leopold 1947, in ASCA’s original draft forward).



Gavilan R., Chihuahua,  
January 1938.

## Some differences between Chihuahua and Southwestern U.S.

Sierra Madre in Chihuahua, Mexico:

- “live oak-dotted hills fat with side oats grama” [a type of grass]
- “pine-clad mesas spangled with flowers”
- watersheds intact
- deer abundant but not “overstocked”

Mountains of southwestern U.S.:

- “the grama is mostly gone”
- “the mesas are spangled with snakeweed”
- watersheds “a wreck”
- deer ranges “overstocked” or nearly empty



New Mexico, ca. 1910 - ca. 1919

*(From “Conservationist in Mexico” Leopold 1947)*

## What accounts for these differences?

Two big factors present in the Southwestern U.S. but absent in Chihuahua – both exacerbated, Leopold says, because of the arid climate:

1. **Overgrazing** – leads to erosion, loss of soil, and thus loss of ability to support the same diversity of plant and animal life.
2. **Extirpation of top predators** (wolves and mountain lions) – leads to boom-and-bust deer population cycles and consequent destruction of plants.



From *A Sand County Almanac*

The differences, Leopold notes, are *not* the result of the mere presence of humans:

- Indigenous peoples lived in Sierra Madre & modified it, e.g., hundreds of dams.
- Yet as noted earlier, Leopold thought the Sierra Madre was an “unspoiled wilderness” in “perfect aboriginal health” – conditions achievable by people “capable of inhabiting a river without disrupting the harmony of its life” (1949).

## Causes and effects of land sickness more generally

Symptoms include abnormal erosion, abnormal floods, decline of yields & carrying capacity, some species “irrupt” and some disappear.

Fundamental causes of land sickness are hard to determine, but, he hypothesizes:

- **loss of soil fertility** (Leopold 1944, 1946, 1949): evidence strong here.
- **loss of diversity of flora and fauna** – evidence more speculative here, but in evolutionary history, diversity of flora and fauna (what we would term “**biodiversity**”) is the factor that is most closely associated with stability (Leopold 1942)



*From A Sand County Almanac*

## But what is the mechanism of land health?

Land is a **fountain of energy** flowing through a **circuit** of soils, plants, and animals. Food chains (animals eat plants, animals eat animals) conduct energy up from the soil to plants and then to animals; death and decay return energy to the soil.

### *In a healthy, or stable, land community:*

“The circuit is not closed; some energy is dissipated in decay, some is added by absorption from the air, some is stored in soils, peats, and long-lived forests; but it is a sustained circuit, like a slowly augmented revolving fund of life” (1949, 216).



From *A Sand County Almanac*

**Continued energy circulation** depends on the **characteristic numbers** as well as the **characteristic kinds & functions** – *interactions* – of the component species.

The **longer the chain of interactions**, the less time nutrients are in the soil and the more time they are bound up in organisms —> **less opportunity for erosion**.



## Restoring land health?

- Even given the sickest of land like the Dust Bowl, Leopold wondered if it were possible to restore its “wasting soils” by planting prairie flowers (Leopold 1949, 220),
- just as he restored his own land in Wisconsin by planting thousands trees and shrubs, many of which died and had to be replanted (Meine 2010).



Aldo and Estella Leopold  
planting pines, 1939

## Contemporary restoration attempts

### 1995 restoration of wolves to Yellowstone:

- Restoring wolves controlled elk populations -> allowed many other interdependent species to flourish, more carbon & nutrients retained.
- *Land can now sustain life over time -> land health restored.*



### Overfishing (a worldwide problem):

- In the Northwest Atlantic, many species are interdependent with cod, and so loss of cod -> loss of those other species as well, with accompanying loss of matter/energy flow.
- *Restoration efforts have been sluggish, not supporting life -> land health elusive.*



Thus, although restoration of land health can be possible, it is not guaranteed.



## Upshot from Chapter 4: Land health

***Land health*** is a land community's **capacity for self-renewal, or stability**, which depends on the ability of energy to continue to cycle within the land pyramid, which in turn **depends on biodiversity** (retaining species in their characteristic numbers, kinds, and functions/interactions, hypothesized to form long food chains facilitating the continuous circulation of food and nutrients) **and on soil fertility**, resulting in the **ability of the land community to support a diversity of life over time.**

This understanding of land health is thus really a form of **sustainability** — sustainability of land communities.



From *A Sand County Almanac*

## Land health is ethically significant

Following an influential paper by Goodpaster (1978), an entity can only be said to be **morally considerable** – that is, deserving of moral respect, part of the moral sphere – if it has **interests**.

According to Goodpaster, an entity has interests if it is capable of being **harmed or benefited**, of having a **good or bad of its own**.

- **Land health** is above all **good for the land community as a whole**, allowing it to persist and thrive, **whether beneficial for particular members or not**.
- Actions that hinder the sustainability of land communities – yielding land sickness – are **bad for those communities**, even if some members benefit (e.g., killing predators for the sake of deer).

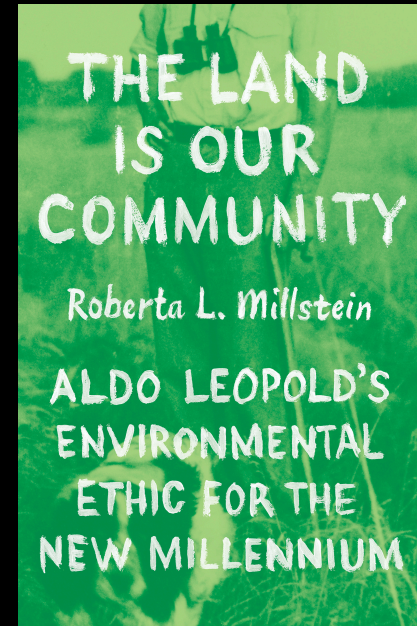


From ASCA

Thus, a case can be made that **land communities are morally considerable**, with **land health** being the central concept that illuminates why and how.

The next video is for Chapter 5, which gives an overview of the argument for the land ethic....

....in other words,  
*why* we should aim to protect and promote  
land health



*The Land Is Our Community* can be purchased (paper copy) or downloaded for free from the University of Chicago Press; the link is on my website at **www.RLM.net**