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What Constitutes Healthy Soil in Riparian Systems?

Contrasting and Relating Soil Properties and management between Riparian and Upland Zones.

Natural Resources Conservation Service

Riparian Restoration Conference, Grand Junction, Colorado

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Natural Resources Conservation Service

nrcs.usda.gov/

Objectives:

- NRCS definition of healthy soil – does it apply to riparian areas?
- Quick look at Ecosystem services that healthy soil provides
- What are the primary differences in soils, riparian vs. upland and define “degraded” riparian soil
- NRCS soil health management principles (agriculture) – do they apply to riparian system management?
- Brainstorm - From a “soil health” standpoint – how could principles be modified for riparian systems?

What is a healthy soil?

NRCS definition:

The continued capacity of the soil to function as a vital living ecosystem that sustains plants, animals, and humans.

Ecosystem Services (quick look)

What are the primary differences in soils, riparian vs. upland/agland

- **Flooding regime – a definitive characteristic**
- **Riparian soils are typically highly stratified**
- **Water Table … usually within 2 m. of surface <u>with associated vegetation</u> or hydric soil**
  - Significant amnt. of agland may have same (exc. veg)
  - Western landscapes - more contrasted
- **Landscape position? (in most cases), definitive**
- **Use & management, Aglands are intensively managed**
  - Portions of riparian areas may be intensively used and managed (recreation)

What are the characteristics of a degraded riparian soil?

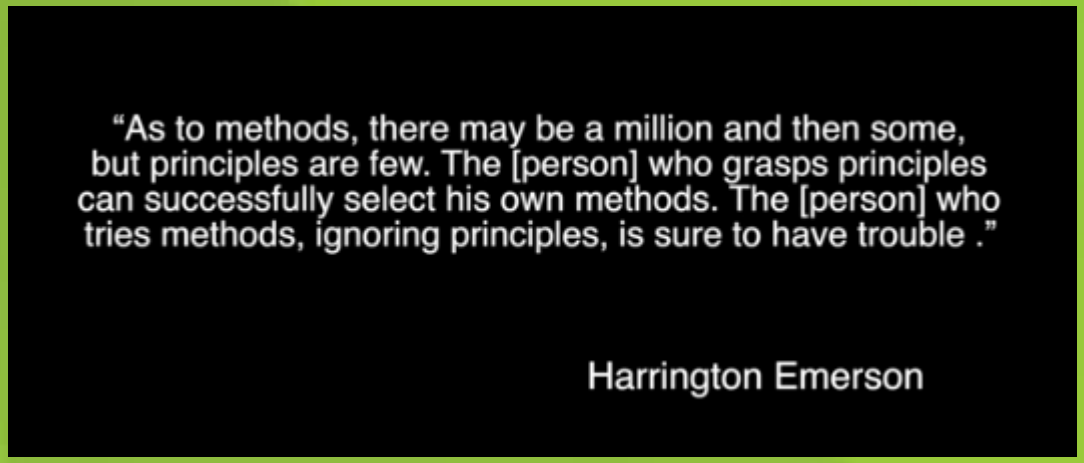
- Desiccation/drying (lowered WT)
- Erosion, sloughing, undercut banks
- Decreased SOM
- Encroaching upland veg. or bare soil
- Lower infiltration?
- Compaction?

Principle vs. Practice

"If your why is broken, so too is your how."

Principle: a fundamental, primary or general law or truth

Practice: the action or process of performing or doing something



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Soil Health Management Principles

Keep live roots in the ground as long as possible

Diversify (cool/warm season, grass/broad leaf)

Keep it covered (no bare soil)

Reduce or eliminate tillage

Integrate grazing animals if possible

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Soil Health Management Principles – Riparian

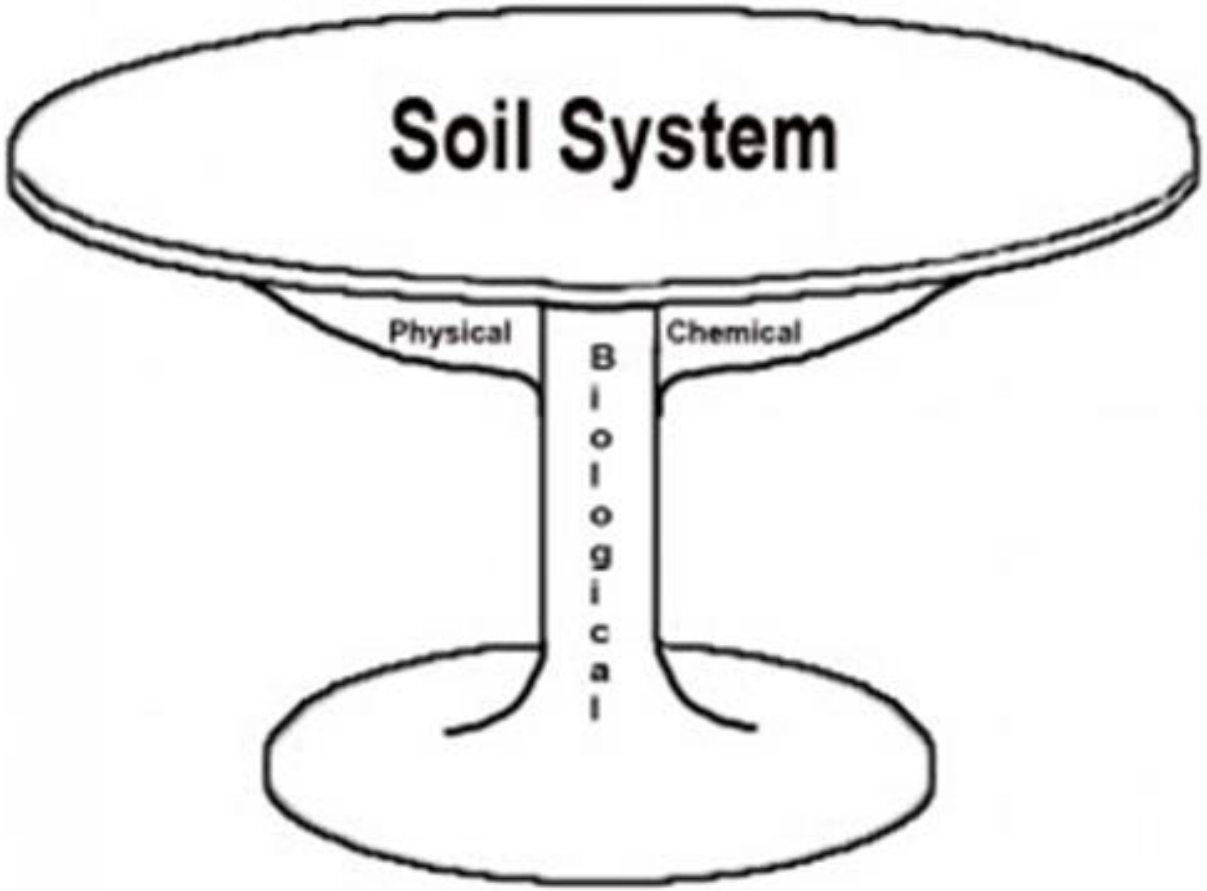
Restore/maintain Water Table

Practice SH principles on surrounding aglands

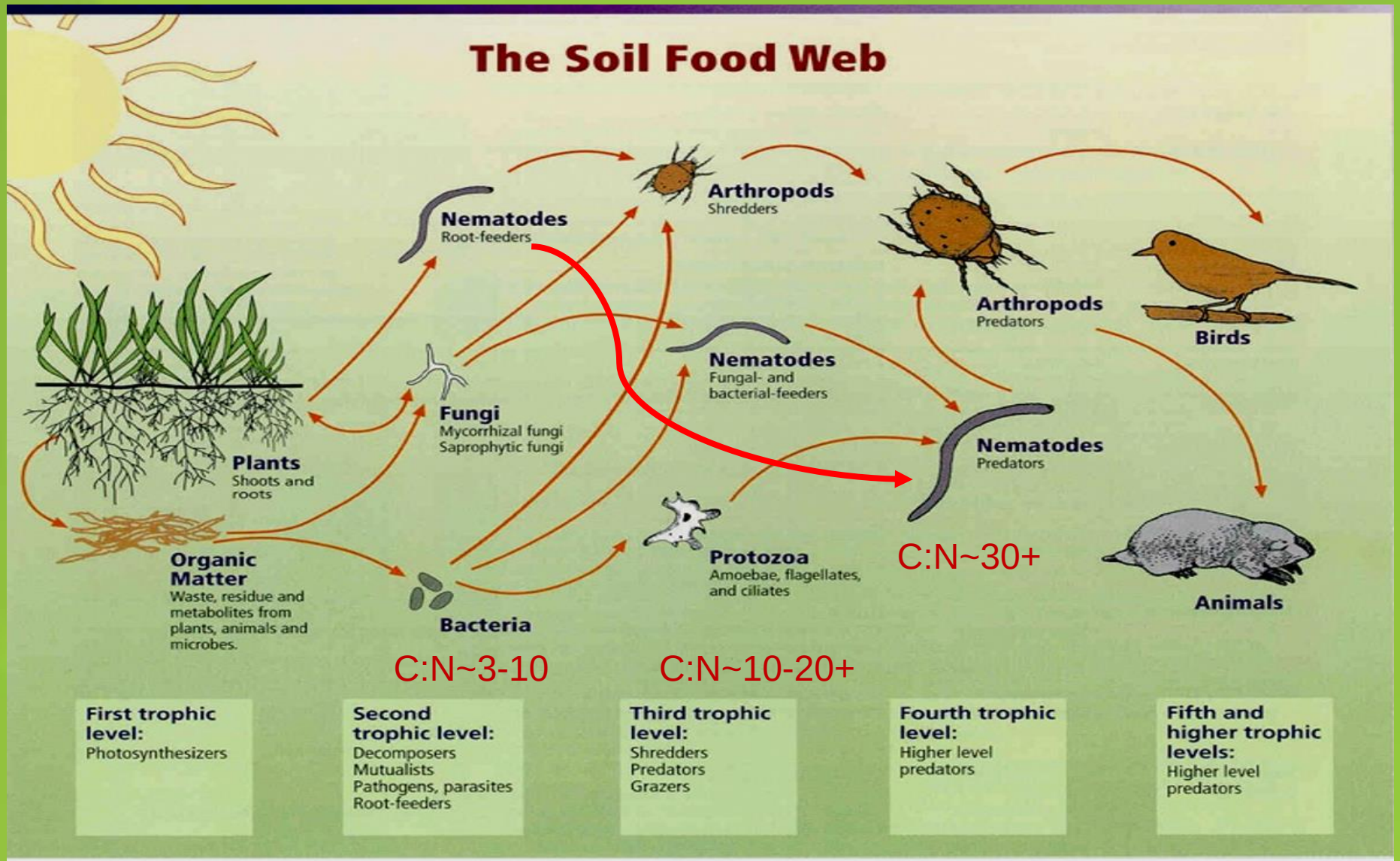
Manage for high diversity

Restore as ecological context dictates

If grazing – manage intensively (closely)


Soil System
Physical
Chemical
Biological

The Soil Food Web – The Nutrient Cycling Engine



Relationships between soil food web, plants, organic matter, and birds and mammals
Image courtesy of USDA Natural Resources Conservation Service


Feed it.
Soil Livestock are a complex and diverse mix of species that represent the greatest concentration of biomass anywhere on the planet. –The underground herd
Protect it.

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References

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Thank you!
Questions?