

Restoring Eden- additional notes and references

Elizabeth D. Hilborn posted August 13, 2023

Chapter 2. Fieldwork

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Supplemental essay: People and nature

E.O. Wilson coined the term “biophilia” and explored the concept in his 1984 book by the same name. In “Biophilia” Wilson explores our intimate, ancient connection with non-human life. It makes sense that this connection is deep and strong. Human knowledge of the living multitude has been essential to our survival as a species. We needed to know sources of food as well as sources of harm. Our intimate knowledge of the distribution of natural communities of plants and animals has helped us to understand the world, to navigate it, and to thrive. In many ways we are truly inseparable.

Humans have been immersed in the multitude until very recently. Our lives drastically changed as industrialization and trade created cities so large that much of ‘nature’ became excluded. With global supply chains and 24/7 retail opportunities, we can more easily ignore the unassailable fact that our lives are fully dependent upon the natural world. Yet our psyches still need nature of some sort.

Even for people who do not have regular, meaningful exposure to nature, evidence abounds that human health and well-being is enhanced by exposure to the natural world with its plants, animals, and microbes (Sandifer and others, 2015; Aerts and others, 2018; Smith and others, 2019).

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Chapter 6. Moving Water

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Supplemental essay: Pesticides in groundwater and wells

Newer, water soluble pesticides pose poorly understood risks to public health. Glyphosate, the active ingredient in Roundup, AMPA, a toxic break-down product of glyphosate, and neonic insecticides have all been detected in wells drawing from groundwater near areas where the pesticides are used (Scribner and others, 2007; Battaglin and others, 2014; Grandcoin and others 2017; US EPA, 2016; Bradford and others, 2018). Recently, these pesticides have also been detected in deeper wells (>50 feet) such as those used to supply drinking water (Van Stempvoort and others, 2016; Bradford and others, 2018; Thompson and others, 2021).

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Supplemental essay: Horses and microbes a life-long partnership

Horses are remarkably picky eaters. They can't vomit, so they fully commit to whatever they decide to swallow. Horses mostly swallow grass—fresh or dried; they evolved grazing on open plains and they require a fiber-rich diet. But unlike cattle and goats, ruminant animals with multiple stomach chambers that process fiber-rich foods, horses have only one stomach. Like us. But the secret to horses' superpower is that they have a cecum. It's a specialized organ, a huge pouch located at the place where their small and large intestines meet. The cecum holds a liquefied slurry of beneficial microbes that work to extract useful food energy from otherwise indigestible fiber.

Anything that can disrupt the microbial community of the cecum can sicken a horse. When gut microbes sicken and die, fiber digestion suffers, and abdominal pain and diarrhea are likely to follow. Sometimes, dying microbes release toxins into the horse's bloodstream—toxins that damage blood vessels. Then, the tiny capillaries of the hooves fail to deliver oxygen to vital tissues resulting in severe pain, lameness, and permanent hoof damage. This is the debilitating foot condition feared by horse-keepers, known as founder or laminitis.

Horses are not the only ones who need gut microbes to stay healthy. Now we understand that our microbes influence our health and well-being too. Gut microbe diversity and the types that are present, the microbial communities, are difference between the slim and the obese; between the anxious and the calm; between the healthy and the chronically sick.

We can influence our microbes by what we eat and drink, by how we care for ourselves. But toxins matter too. Every year, we learn more about how toxins such as glyphosate change

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