Summary of Garden Ecology 101: Principles

Presentation for Vancouver Master Gardeners, February 8, 2024

Elizabeth Elle, Simon Fraser University

Registration summary: Did you know that your garden can be part of the solution to our biodiversity crisis? And that supporting diverse organisms in your garden makes your work as a gardener easier? In this session Elizabeth Elle will explore how interactions among the organisms in your gardens are essential for healthy soils, good pollination, and effective pest control. She will also help you understand the importance of the larger landscape for the success of your garden, and the value of residential yards like yours for conservation.

1) An Ecosystem is the living organisms, their physical environment, and all interactions.

- Here in the Fraser River Delta, most of us live and garden in what was Coastal Rainforest.
- Our mild climate with pronounced summer drought combined with acid soils can limit what will thrive here. Considering seasonality and physical conditions can lead to easier more successful gardening.
- Ecosystem services are what nature provides—our gardens benefit from these (especially in the form of pollination and pest control) and our gardens can also help to provide ecosystem services within the urban and suburban areas where we live.
- Ecosystem services are usually in four categories:
    - Provisioning services: the material or energy outputs from an ecosystem (food, water)
    - Regulating services: moderation or control of ecosystem processes (climate, carbon, nutrients, pollination, pest control)
    - Supporting services: services that maintain fundamental ecosystem processes (habitat)
    - Cultural services: the non-material benefits that ecosystems provide to human societies

2. Nutrient cycles give us insight into how our garden functions.

- Most nitrogen comes from decomposition, and relies on a diverse soil biota (especially fungi and bacteria) to work properly.
- Our plants and soils are an important sink for atmospheric carbon.
- Things to consider:
    - Leave organic matter in your garden (chop and drop, leave the leaves) where it can be naturally recycled.
    - Mulch, and disturb your soil as little as possible
    - Common weeds can tell you about your soil (pea family plants fix N, so are found when N is limiting; creeping buttercup indicates wet soil; etc).
    - Plant more perennials/shrubs if you can, they are a carbon sink

3. Food webs are a way to understand garden beneficials.

- Energy/mass is lost with every link in the chain from plants to herbivores to carnivores. There are always fewer carnivores (the predators you want to eat the things that eat your plants!).
- There are complex interactions both in the soil and above ground, but the basis of them is a diverse community of plants
- In the next lecture, we will learn how to support the beneficials (predators and pollinators) that we want working in our gardens
- Things to consider:
    - Be patient! Because predators are less common than herbivores, you may not notice them at first. Careful observation and an IPM approach is best.
    - Consider ways to support beneficials, like nest sites, alternative hosts, and overwintering requirements (more on this next lecture)

4. Landscape ecology puts our gardens into a larger context.

- The main reason species are at risk of extinction is due to habitat loss and fragmentation
- Larger fragments of habitat, and habitat fragments connected to other fragments, have:
    - More species
    - Larger population sizes
    - Improved ecosystem services
- Your garden, and areas surrounding your garden in the landscape, can contribute to ecosystem services. Especially important are large trees, fruit bearing shrubs, and flowers.
- Consider the advice of Doug Tallamy in Nature's Best Hope:
    - Plant native plants that are food for pollinators, caterpillars
    - Reduce lawn, remove invasives, increase plantings of perennials
    - Network with your neighbours