10-Minute University™
The Clackamas County Master Gardener Association in collaboration with and in support of the OSU Extension Master Gardener™ Program

Restore Natural Ecosystems in Urban Gardens

Rapid growth of humans in urban areas often leads to development and expansion of transportation networks that fragment natural landscapes and ecosystems. This disrupts natural processes and reduces the capacity of ecosystems to mitigate the effects of storms, floods, wildfires, heat waves and droughts. It also results in loss of habitat for pollinators, bats, birds and amphibians. (Hardy et al. 2022)

In the Portland metropolitan area, public, private, non-profit and tribal entities work together to protect natural areas from development and fragmentation. Restoring ecological functions in home gardens, school grounds, parks and other community spaces, can enhance the regional effort. By observing nature and following ecological principles, gardeners can improve resilience of their own gardens and add habitat for wildlife. Working with neighbors, they can extend the impact.

ECOLOGICAL PRINCIPLES AS RESTORATION GOALS

Ecology is the study of how living things interact with their environment. By translating ecological principles into restoration goals, we can let nature guide our actions to restore ecosystem functions and increase resilience of our environments and communities.

- ***PRINCIPLE: Everything is connected.***
  - Physical connections allow movement of wildlife within and across urban areas.
  - ***GOAL: Reconnect ecosystems and fragmented habitats.***
- ***PRINCIPLE: Everything goes somewhere.***
  - Elements on Earth are finite. Water, carbon and key plant nutrients (N, P, K), circulate through Earth's systems in different forms, supporting life on Earth.
  - ***GOAL: Restore natural water and nutrient cycles.***
- ***PRINCIPLE***: ***Nature knows best***.
  - Life evolves to fill ecological niches to ensure survival of individual species. The greater the diversity of life, the more resilient the system is to disturbances like climate change.
  - ***GOAL: Strive for diversity.***

RESTORE ECOLOGICAL FUNCTIONS IN GARDENS

Gardeners can adapt habitat restoration practices to improve the garden ecosystem. It begins with observing nature, followed by encouraging diversity and restoring water and nutrient cycles.

Observe and Learn from Nature

Observe what is thriving in your yard and what is not. Consider how much sun each part of the garden receives. Explore plants on surrounding lands. A nearby area that supports native plants is ideal. Identify the plants that you would like to see in your garden. Note whether they grow in sun or shade, dry or wet conditions. Observe the insects and birds that visit the plants. Aim for diversity; the greater the diversity of plants, the greater the diversity of wildlife species that a garden can support.

Restore water and nutrient cycles

Begin by restoring soil health to improve water holding capacity and nutrient availability for plants.

- Minimize soil disturbance to preserve soil structure and increase diversity and abundance of soil organisms, including fungal networks which facilitate plants' access to nutrients.
- Minimize tillage and create walking paths that minimize soil compaction. Consider limiting the areas for parking or driving.
- Aim to cover the soil with plants. Add mulch to areas with bare soil or keep some ground uncovered for ground-nesting bees.
- Add mulch on top of soils to speed up the soil regeneration process. Mulches, like arborist wood chips and leaves, can increase the volume and diversity of soil organisms which in turn will provide more nutrients to support plant growth. Wood chips and leaves also help retain soil moisture and reduce weeds.
- Add woody debris in the form of logs and stick piles that provide habitats for insects and, if conditions are right, amphibians. These will eventually be decomposed by soil organisms, building soil volume. Use logs to define trails or bed borders.
- Keep water on the land by retaining organic matter and litter at the surface. Keep large trees with extensive roots to help increase water infiltration and to provide shade.
- Install bioswales and rain gardens and disconnect downspouts where viable.
- Store rainwater for use in the yard and reuse gray water in the home where possible.
- To protect water quality, avoid oil and fuel leakage on driveways. Avoid use of chemicals to control moss, weeds or pests in outdoor spaces.

Strive for diversity

Provide homes for a wide variety of wildlife that feed, make homes and find protection in dense native plantings.

- Remove invasive plants that can outcompete beneficial plants.
- Plant a diversity of plants that are native to your region.
- Plant five canopy layers (big trees, small trees, large shrubs, small shrubs, ferns and grasses, and herbaceous ground covers) leaving a buffer around built structures to reduce fire risk.
- Select the right size trees. For small lots near houses, consider native hazelnut, red alder, bitter cherry, Cascara, western flowering dogwood or madrone. Select trees to match the soil, water and light conditions of the landscape.
- Cover the soil with dense plantings, grouping plants with like water, nutrient, and light needs.
- Select plants that provide continuous bloom throughout the seasons.
- Interplant with crops to make an edible landscape.
- Replace lawns with hedgerows, pollinator meadows, ground covers or an eco-lawn that includes a mix of slow growing grasses and forbs.

RESOURCES

- Climate Resilience Handouts: Ecosystems, Soils, Lawns, Water, Plants.
- Native Plant Resources: Using Native Plants in Your Garden, Portland Plant List , Backyard Habitat Program.
- Other Handouts: Firewise Landscapes, Integrated Pest Management for Home Gardens, Adding a Bioswale, Adding a Rain Garden.