From: ***Integrated Landscaping- Following Nature's Lead (Revised Edition)***

Landscape Practices Aligned with the Ecological Principles

These landscape practices are directly linked to the processes of nature and the biodiversity found within our landscapes. By supporting one, you support the other.

1. **Rainfall is filtered and conserved until needed.**
   - Minimize impervious surface.
   - Keep water on site by increasing infiltration and storage (i.e., large dead wood, all structural layers).
   - Use plants to slow the flow.
   - Plant densely and leave litter to mitigate rains, winds, and drying sun.
   - Use diverse leaf forms and diverse root systems to clean rain and hold onto soil sediments, respectively.
   - Trace erosion back to source and fix using plants to reduce velocity and increase evapotranspiration.
   - Design for increased dry conditions by including some drought tolerant plants.
   - Maximize shoreland buffers.

2. **Structural layers cover and protect soils, and the life contained within.**
   - Provide all structural layers. Add what's missing to ensure landscapes include:
     - ✓ Upper canopy
     - ✓ Lower canopy
     - ✓ Tall shrubs
     - ✓ Short shrubs
     - ✓ Vines
     - ✓ Herbaceous layer: grasses, forbs, ephemerals, ferns
     - ✓ Woody, herbaceous ground covers
     - ✓ Thallophytes such as lichens and mosses
     - ✓ Diverse litter layer
     - ✓ Thick "O" horizon
   - Plant a mix of evergreen and deciduous plants to ensure soil coverage in winter.
   - Soften edges of the interface between woods and lawns by 'stair stepping' vegetation.
   - Provide living fences and hedgerows.
   - Create windbreaks to protect soils and habitat from excessive drying.
   - Keep native plantings along yard perimeters intact, including front yards.
   - Connect to natural linkages, corridors, and greenways throughout the neighborhood.
   - Save large trees, especially those with cavities and trees that provide mast.
   - Reduce the size of lawns and other simplified less diverse ecosystems.

3. **Animal and plants, living together, are the rule.**
   - Bring in fruit, flowers, seed heads by planting diverse, native plant species.
   - Heavily stud with natives, about 80% of overall plantings.
   - Provide structure, both horizontal and vertical.
   - Promote nesting/shelter/cover.
   - Leave litter layer for invertebrates and insects.
   - Build diverse litter layers to protect and conserve a diversity of microorganisms. Use on-site resources for mulch and compost.
   - Allow some perennials and grasses to stand above snow height for winter food.
   - Plant sources of nectar, pollen, and larval food for pollinator complexes.
   - Plant evergreens for extreme low temperature and protection from wind.
   - Design outdoor lighting use for minimal disruption to nocturnal species.
   - Limit tree care to safety issues: leave old, large, dying and dead trees, when possible.

4. **Feed soil life on site; "feed the soil, let the soil feed the plants".**
   - Always cover soils to prevent erosion and leaching unless providing small areas for bird dusting or turtle egg laying habitat. Cover stored soil piles.
   - Gain an understanding of current soil structure and conditions to help with species selection, plant health, and soil development.
   - Leave litter on including, woody materials to add and replace organic matter over time, especially ramial chipped wood (RCW).
   - Run on-site litter through a chipper-shedder for mulch, bringing in less bark.
   - Tuck weeds, which are full of nutrients, under plants to decompose in place (remove seed heads first).
   - Shear dead standing perennials into 2" pieces, letting them fall to litter layer, increasing habitat and organic matter.
   - Improve soil by using cover crops prior to planting an area.
   - Practice 'no-till' where possible by using sheet mulching to protect soils.
   - Regenerate soils to 'better than you found them conditions.'
   - Investigate the use of bio-char, ramial chipped wood, and making on site compost teas to improve soil and plant growth over time.

5. **Humus is microscopic, yet essential for fertility and soil structure.**
   - Break up larger sticks into smaller pieces and leave on site, tuck under plants if necessary.
   - Leave larger logs and coarse woody debris to decompose in place.
   - See practices above in 4.

6. **Build diversity to spread risks and to ensure natural checks and balances.**
   - Build predator populations like wasps, hornets, spiders, birds, amphibians, reptiles, and small mammals.
   - Build in insectary plants for parasitoid wasps.
   - Build trophic levels, from soil biology and invertebrates to bigger animals.
   - Provide native plants for herbivorous insects because 96% of all bird species depend on insects during reproduction.
   - Prevent predation by domestic cats. Keep trash and open compost piles covered.
   - Be aware of barriers regarding wildlife passage such as curbing, solid stone walls, terraces, fences, large open expanses of turf, and impervious surfaces. Build in access, openings, and crossings.
   - Use culverts with natural stream bed sands and gravels
   - Provide perches and flyways for birds and some insects.
   - Use water to attract wildlife, a birdbath, water feature, or a pond. Water sources are important all year including shallow running water and wet gravel and pebbles. Edges allow wildlife to come and go.
   - Design in and around:
     - ✓ **Compositional diversity** such as snags with nesting cavities, large dead wood, rocks and boulders, and undisturbed soils.
     - ✓ **Structural diversity** such as vegetative layers, age structure, and successional patches.
     - ✓ **Functional diversity** such as niches, food webs, species interactions, soil microbes and fungi.
   - Have about 80% native plants as a backbone in your landscapes.
   - Use disease resistant cultivars and varieties when possible.
   - Remember, there is no good and bad in nature; everything is food for everything else.

7. **Plants supply clean and fresh air above and cool shade below.**
   - Leave litter on to help regulate temperature swings in soil level.
   - Do not over mulch; 2”-3” is enough.
   - Avoid compacting soils.
   - Design and stay on pathways through meadows and woodlands to avoid compaction.
   - Know that roots die in place adding organic matter and air channels into soil layers.
   - Cool moist soils enhance root growth and mycorrhizal fungi.
   - Add missing layers to increase ‘air-conditioning.’
   - Practice necessary and correct pruning only.
   - Create micro-climates with boulders, and logs for moisture storage and habitat.

8. **The subsoil provides on-site inorganic compounds.**
   - Take advantage of the practice of burrowing animals, such as ants, moles, turtles laying eggs, as well as large tap rooted plants as they bring minerals to the upper levels where they can be cycled into the soil food web.
   - Cover newly exposed soils with diverse mulches.
   - Use diverse plants with varied root systems.
   - Always take a soil test when applying off-site amendments.

9. **Landscapes change over time; look at succession with a selective eye.**
   - Give woody plants enough room according to their mature size.
   - Fill in with herbaceous grasses, ground covers, and clumping and spreading perennials.
   - Let seedlings establish where wanted, weed out and reuse others.
   - Transplant seedlings to enhance other areas.
   - Allow landscape beds to fill out while decreasing lawn areas over time.
   - Watch how species composition changes, as habitat succeeds and changes over time.
   - Remove opportunistic and invasive species when small.

10. **Respect humans’ need for beauty, choice, and interest in the landscape, including a sense of place and history.**
    - Get people out and involved in nature and in their landscapes.
    - Maintain and enrich sense of place.
    - Look to surrounding lands for clues on native species usage, and land features that may be mimicked in your landscape.
    - Respect and enhance historical artifacts in the landscape.
    - Include features for people that heighten their experience and time spent in the landscape.
    - Benefit both humans and wildlife with four-season and winter interest, as well as a continuation of color and bloom.
    - Demonstrate that aesthetics and ecology in the landscape are not mutually exclusive!

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