

Biodiverse Systems

A close-up photograph of a green katydid (Orthoptera) perched on a yellow flower. The katydid is positioned on the left side of the frame, facing right. Its long, thin legs and antennae are clearly visible. The flower has large, bright yellow petals and a prominent yellow stamen. The background is a soft, out-of-focus blue sky.

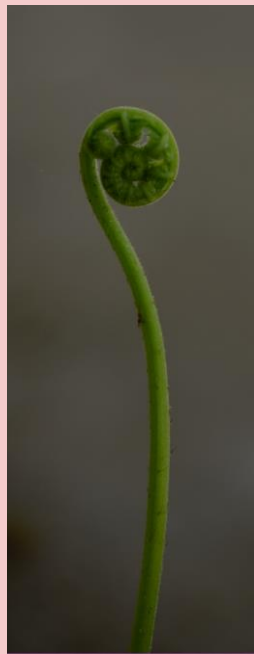
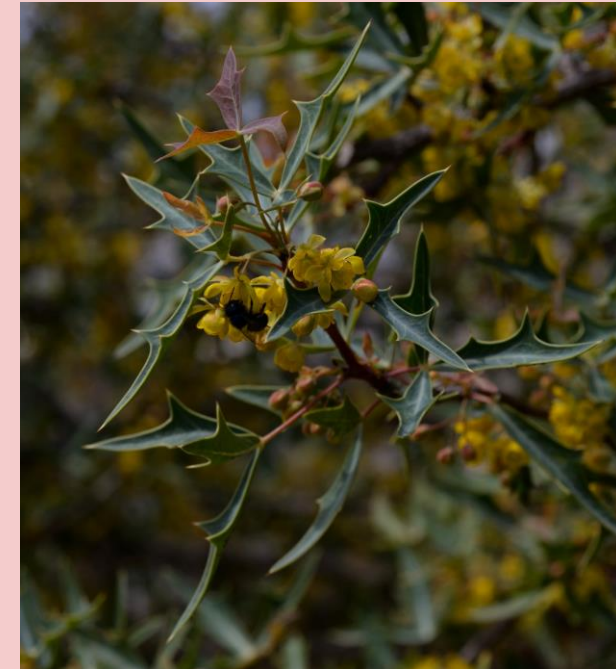
**Look deep into Nature and then
you will understand everything
better.**

Albert Einstein

Emmy's Earth: Biodiverse Systems

Goal: Increase **biodiversity** in the urban setting and by doing so create beauty and recharge for humans. In my yard, I:

1. use the resource elements of food, water and shelter to create habitat for local organisms,
2. have pollinator and butterfly gardens to provide appropriate resources all year long,
3. garden for wildlife and my yards is a certified National Wildlife Federation Wildlife Habitat and a North American Butterfly Association Butterfly Habitat.
4. include spaces for humans to sit, observe, and connect with Nature.



Why is this important? Because we are starting to recognize that our lives depend on relationships in natural ecosystems!

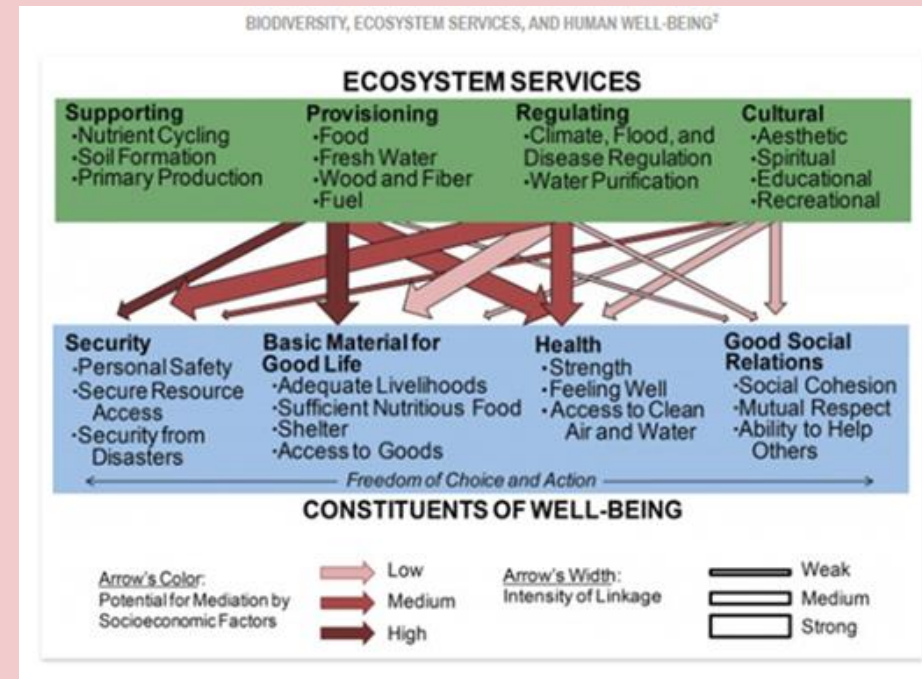
- **BIG IDEA 2: INTERACTIONS BETWEEN EARTH SYSTEMS (ERT)**
The Earth is one interconnected system.
- **BIG IDEA 3: INTERACTIONS BETWEEN DIFFERENT SPECIES AND THE ENVIRONMENT (EIN)**
Humans alter natural systems and have had an impact on the environment for millions of years
- **BIG IDEA 4: SUSTAINABILITY (STB)**
Human survival depends on developing practices that will achieve sustainable systems.

From: AP Environmental Science Course and Exam Description:
<https://apstudents.collegeboard.org/sites/default/files/2019-05/ap-environmental-science-course-and-exam-description.pdf>



We are disconnected

Profound changes are occurring in the American public's connections to nature, the outdoors, and wildlife. These pose a nationwide problem since human health and well-being depend on beneficial contact with nature.



“These trends pose a nationwide problem, since overwhelming evidence shows the **physical, psychological, and social well being of humans depends on contact with nature.**”

From: The Nature of Americans National Report p. 3

I am only **ONE** person, what
can I do?

- You can **CARE**
- You can **CREATE HABITAT**
- You can do **NO HARM**
- You can **FIND JOY** in Nature



WHAT do you need to survive?



Habitat: where individuals of a species live: contains food, water, and shelter to meet the organism's needs.

Resources: things an organism needs to live: food water and shelter



Plant mostly natives
that bloom
throughout the year
in a variety of shapes,
colors, and sizes....



FOOD
for urban
wildlife



Color



Shape



... and you will
have pollinators,
butterflies, and
other inverts as
well as birds,
turtles, lizards and
small mammals!



Season

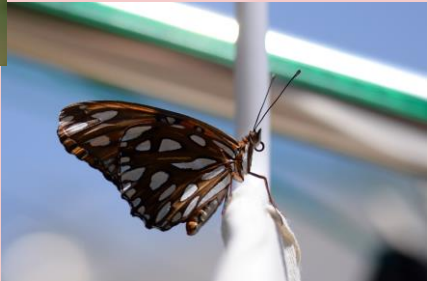
Adults and
larvae may have
different foods!



Gulf Fritillary



**Passio
n vine**



Water



- Shallow basins
- Pebbles
- Wet mud
- Mosquito deterrent



Bill Lupardus



- Leave bare ground and avoid weed cloth.
- Leave brush piles, hollow twigs and rotten logs; be slow to take down garden.
- Maintain cleanliness.



Shelter

Build a Bee Nest Bundle

PROMOTING BEES IN YOUR NEIGHBORHOOD

BUILD A BEE NEST BUNDLE

- Instead of drilling holes into a piece of wood, you can provide premade tunnels in twigs for bees.
- Cardboard straws, either prepackaged in a ready-made container and available from an insect supply store, or singly, can be purchased.
- Alternatively you can tie together bundles of hollow elderberry stems, pieces of bamboo, leasel, reeds, yucca stems, or other hollow stemmed plants. Roughly one to two dozen stems can be bundled together.
- The straws should be roughly 6–9 inches in length, and it is important that one end of the straw is closed. Ideally, cut your natural stems just below a node, so that one end is naturally sealed. Otherwise, a small dollop of caulk will work.
- Straws can be stuffed inside a piece of 2- or 3-inch PVC pipe with one end capped. Don't be surprised if some bees nest in the spaces between your straws too!



Let me out!

When a bee has completed its preadult life stages, it bulges its way out of the nest, charging through anything in its way. Ground-nesting bees will often dig straight up, forging the tunnel prepared by their mother for a more direct route to the surface. "Bulging" means go back the way their mothers came, pushing through nest cells in front of them, and often destroying any of their siblings still in the process of growing. It is probably a good thing that the mothers lay the slower developing females at the back of the nest so their brothers don't destroy them as they bore their way out.



Below: The top nest of a digger bee. Note that the nest cells, each of which contains one bee, are all in a row. From a Journal of the Royal Entomological Society.



Below: The entrance nest of a digger bee. Note that the nest cells, each of which contains one bee, are all in a row. From a Journal of the Royal Entomological Society.

Information from: Wilson J.S. and O. Messinger Carrill, The Bees in your Backyard. Princeton University Press. Princeton NJ. p. 18 and 58.











But not just in yards...

Anywhere!

Schools and Churches



Yards




Agricultural Areas



Urban Commons



A photograph of a residential landscape. In the foreground, there is a dry, yellowish-brown lawn. A concrete curb runs diagonally across the middle ground, separating the lawn from a garden bed. The garden bed is filled with various plants, including tall green shrubs on the left, a cluster of orange flowers in the center, and some purple flowers. In the background, a house with a grey metal roof is visible, partially obscured by trees and shrubs. A large tree with dense green foliage is on the right side of the house. A brick wall and a wooden fence are also visible in the background. The sky is blue with white clouds.

**What if nothing moves in your landscape but a
lawnmower?**

--Laurie Ott