Considerations for Pollinators in the Longleaf Ecosystem

Lisa Lord
Conservation Programs Director
The Longleaf Alliance

Why is longleaf groundcover important for pollinators?

- Role of pollinators in the environment
- Meet the insect pollinators
- Pollinator Habitat and Management

Services provided by Pollinators

- 85% of flowering plants (fruits, nuts, and vegetables) require an animal (usually insects) to transfer pollen
- One third of the food or drink we consume is influenced at some point by pollinators
- **Approximately 75% of plant species endemic to longleaf depend on insects for pollination (primarily bees)**

Dwarf Indigo Bush (Amorpha herbacea)

Wildlife Benefits

- Pollinators support plant communities and all the services they provide (nesting, loafing, foraging…)
- Pollinator-produced fruits and seeds produce 25% of the diets for birds and mammals globally.
- 90% of birds rely directly on insects at some points in their life

The Native Plant Connection

- Native pollinators evolved with and are adapted to native plants
- Insect diversity increases with plant diversity.
- Important to have pollen, nectar, and habitat available throughout the year

The flower-pollinator relationship

- Pollinators are critical to the long-term survival of many of the flowering plants in the longleaf forest

- Pollinators provide a mechanism for pollination.

- And flowers provide the floral resources for foraging insects (Proctor et al. 1996).

Meet the Pollinators

- Most pollinators are insects, but pollinators also include bats and birds
- There are <u>four</u> major groups of pollinating insects: bees and wasps, flies, butterflies and moths, and beetles.
- The most economically important pollinating insect to agriculture is the European **honey bee** which is *not* native to the United States.

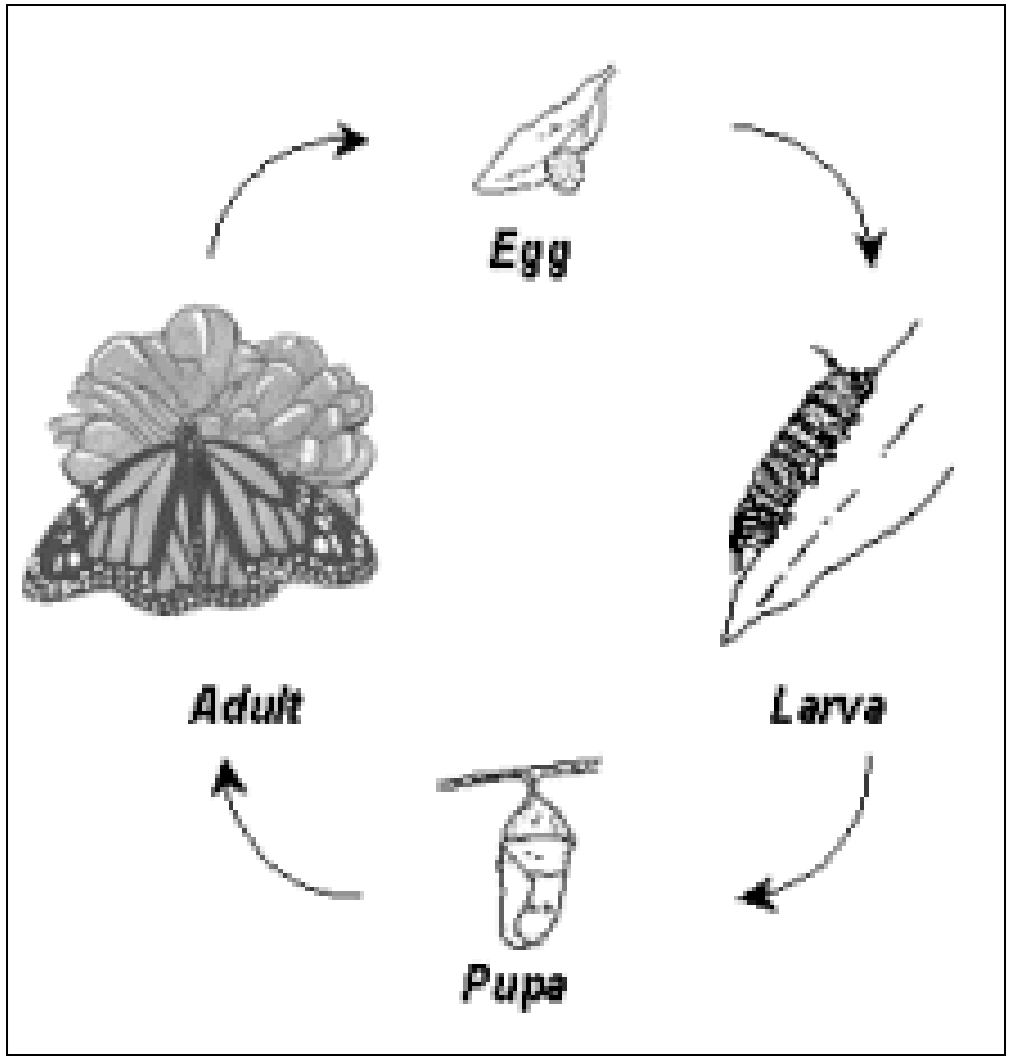



Lepidoptera: Butterflies and Skippers

- Approximately 700 species of butterflies and 13,000 species of moths in the US

As butterflies and moths acquire nectar they pick up pollen on their bodies and then deposit pollen on subsequent visits

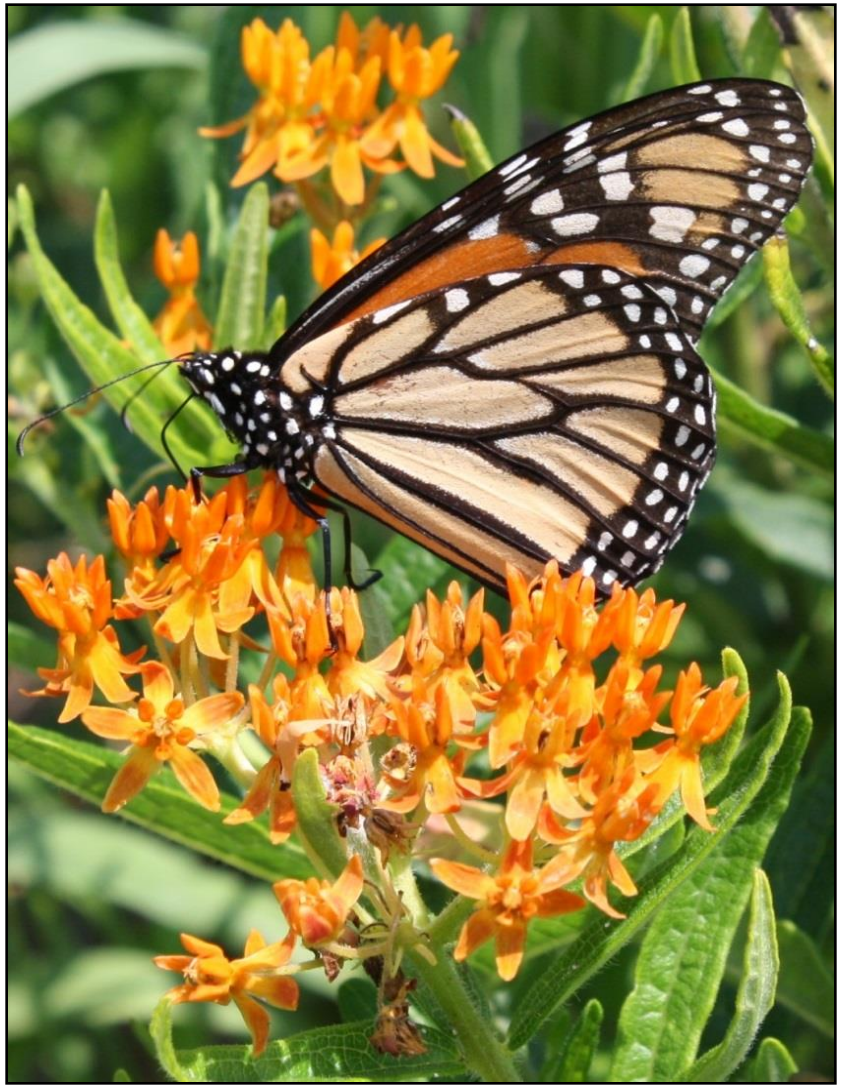
The Butterfly Life Cycle



Butterflies and Moths need nectar and host plants

- Larvae eat only specific host plants
- Adults are generalists and will sip nectar from many types

Monarch caterpillar and adult on milkweed, *Asclepias tuberosa*
Photos by: Sudie Thomas, NRCS



Coleoptera: Beetles

delta flower scarab and other tiny beetle on mountain mint, *Pycnanthemum* sp. (Photo by Sudie Thomas)

52 native plant species pollinated by beetles in North America north of Mexico.

Diptera: Flies

- Incidental pollinators
- Eat pollen and nectar for energy
- Lay eggs on flowers and then larvae will eat flower heads
- Look for mates around flowers

Photo: Mace Vaughan (Xerces Society)

Hymenoptera: Wasps

- Wasps need key resources such as pollen and nectar from a variety of flowers.
- Less efficient at pollination than bees

Hymenoptera: Bees

- Collect and transport pollen
- "Hairiness" makes them good pollinators
- Regularly forage in area around nest
- Exhibit flower constancy

Bees and bee "lookalikes": What's the difference?

European Honey bee

Bees

Long tongues
Two pairs of wings
Scopa (pollen carrying structures) on hind legs
Long antennae
Hairy
Constricted waist

Wasps

No pollen carrying structures
Sparse non-branched hair

Yellow jacket (left) vs honey bee (right)

Flies

Short mouthparts made for sawing and lapping
No pollen carrying structures
Not hairy
Very short antennae
Large central eyes

Hover Fly

Pollinator Habitat

1. Provide nectar and pollen during the growing season
2. Provide host sites for larvae
3. Provide cover and structure

Floral Diversity

- Insect diversity increases with plant diversity.
- Native pollinators evolved with and are adapted to native plants.
- Important to have pollen and nectar available throughout the year

Spring Blooming Understory plants

Baptisias can host up to 15 native Lepidoptera including Wild Indigo Duskywing, Eastern Tailed-Blue, Orange Sulphur, Clouded Sulphur, Frosted Elfin

Lupinus hosts 30 native Lepidoptera

Spring Blooming Understory plants

Sand Myrtle (*Leiophyllum buxifolium) is a small s*andhills endemic, small woody species

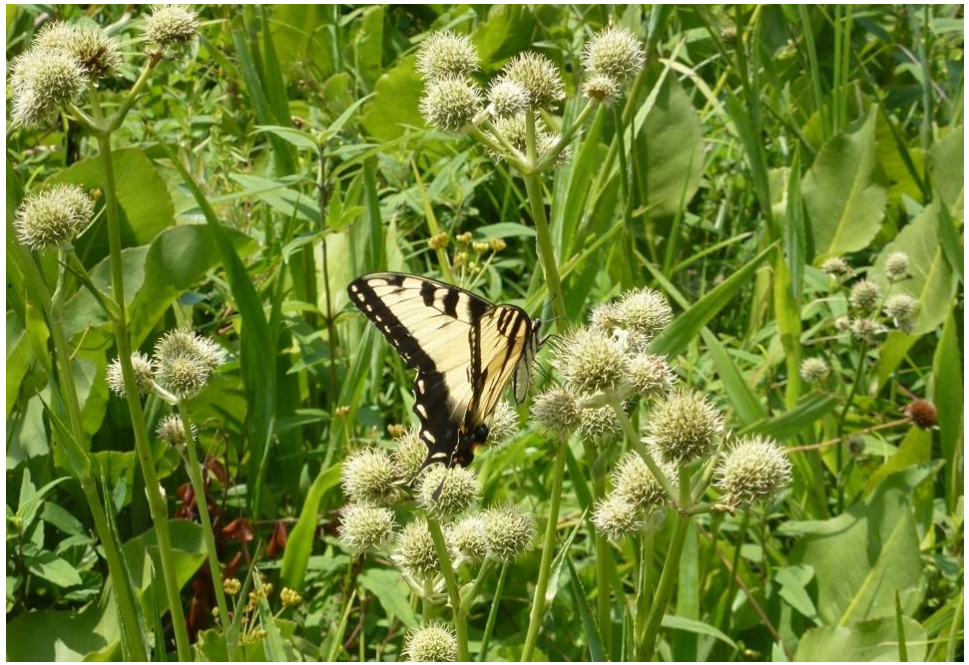
Tephrosia is a host plant for the larvae of 6 species of butterflies and moths.

Needs bees to properly trip pollen delivery mechanism.

Spring-Summer Blooming Understory plants

Partridge pea is a larval host for sleepy orange, orange sulphur, cloudless sulphur
7 total Lepidopterans

Chamaecrista nictitans, **small flowered/sensitive partridge pea**



Eryngium yuccafolium, **rattlesnake master**

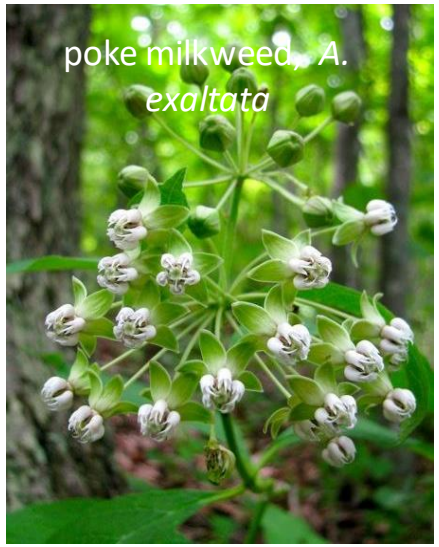
Spring-Summer Blooming Understory plants

Smartweeds ***(Polygonum)*** host 56 lepidopterans and offer preferred nectar

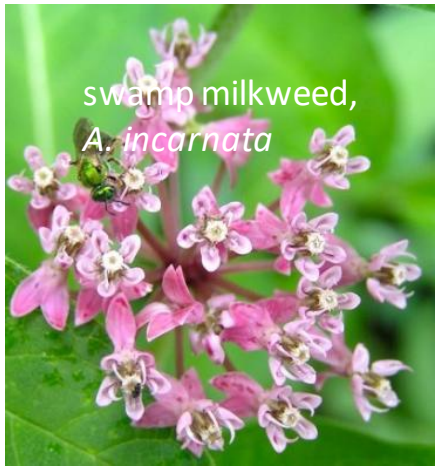
Summer/Early Fall Blooming Understory plants

Native Milkweeds (*Asclepias* spp.)


purple milkweed, *A. purpurascens*


poke milkweed, *A. exaltata*


Asclepias tuberosa, **butterfly milkweed**


swamp milkweed, *A. incarnata*

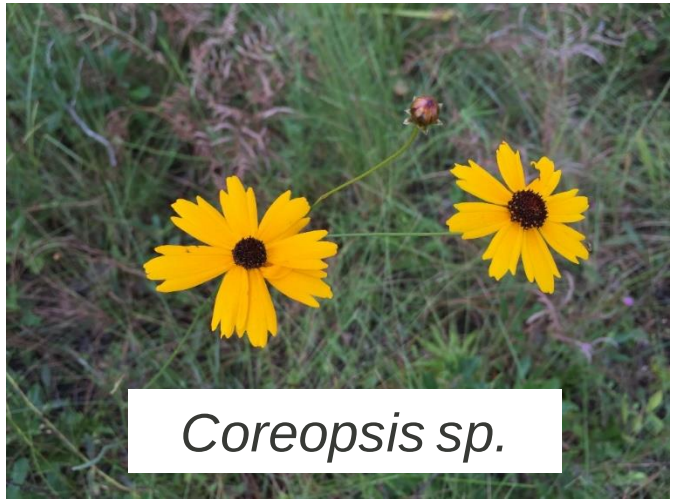
- If using plugs or plants in restoration projects, be sure they were not grown with systems insecticides.
- Avoid non-native milkweeds

Tropical (non-native) milkweed

Photos: Nancy Adamson

Late Summer- Fall Blooming Understory plants

ASTERS: many yellow composites



Coreopsis sp.

Balduina uniflora

Pityopsis graminifolia, silver-leaved aster

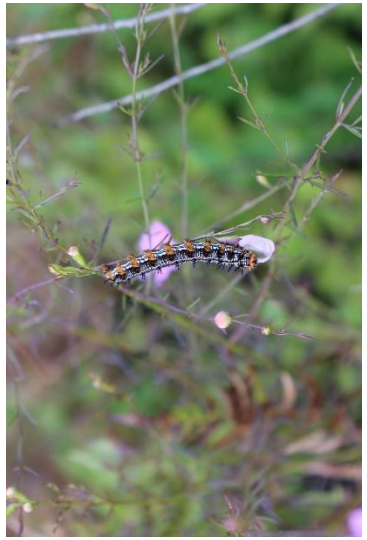
Helenium sp

Late Summer- Fall Blooming Understory plants

- Asters (many, many species) but includes goldenrods, frost/heath asters, blazing stars, sunflowers, cup plant, thoroughwort/boneset

- Asters host approximately 105 native moths and butterflies

Late Summer- Fall Blooming Understory plants



Purple false foxglove **(*Agalinus - several species)***
is the larval host for the Common Buckeye and several other lepidopterans

Late Summer- Fall Blooming Understory plants

- *Eupatorium* hosts 41 Lepidopterans!

Grasses for Insects

Grasses are vital fine fuel for carrying fire but also provide:

- Shelter ground-nesting birds, bumblebees, and other wildlife.
- Shelter for overwintering butterfly larvae or pupae
- Host plants for larvae of grass skippers and some other butterflies

Woody shrubs and small trees - nectar and host plants sources

Maple (Acer spp.)
Blueberry, sparkleberry (Vaccinium spp.)
Serviceberry (Amelanchier spp.)
Redbud (Cersis canadensis)
Huckleberry (Gaylussacia spp.)
Holly (Ilex spp.)
Rhododendron spp.
Willow (Salix spp.)

Locations for pollinator habitat

- Maintain high diversity in existing within stands
- Sunlight (at least 6 hrs per day)
- Farmland margins, field borders, old fields with low plant diversity, logging decks, or areas where exotic plants have been removed

Tips for installing Pollintor Borders

- Field borders should be at least 30 feet wide.
- **For Wildlife:** plant 3 or more species of native grasses and/or wildflowers (rate: 25-30 PLS seeds per square foot)
- **For Pollinators:** 10 or more species: 9 native wildflowers and at least 1 species of native grass (rate: 40–60 PLS per square foot)

Remove competing plants (bahia, bermuda, fescue, sericea, Johnson grass…) prior to seeding

Pollinator “patches” or plots

Size

- half acre or large with 45% forb cover.
- For areas less than a half acre, create multiple patches that are within site of other patches.

Species selection

- Provide flowering plants throughout the growing season that includes host and nectar plants
- Bees use hollow stems and lepidoptera often overwinter. Mowing or burning all the available habitat could impact populations over time.
- If live plants are used, plant 1200-200 plants per acre.

Maintenance

Year 1

- Germination may take several weeks and flowering may not occur with some species until the second or third year.
- Adding a few annual flowers into your seed mix can provide some flowers in the first year.
- Mowing can help to effectively control weeds.
- Spot spraying and pulling weeds (in small plots) can also be effective
- For taller weeds, wicking can also be useful.

Year 2

- In the early spring, mow with blades above 8 inches. (Mowing in the winter will remove cover for wildlife.)
- Mowing can occur again in the late spring. Avoid late summer and fall moving unless absolutely necessary to conserve seed heads for birds.

Year 3: BURN!

Pollinators and Fire

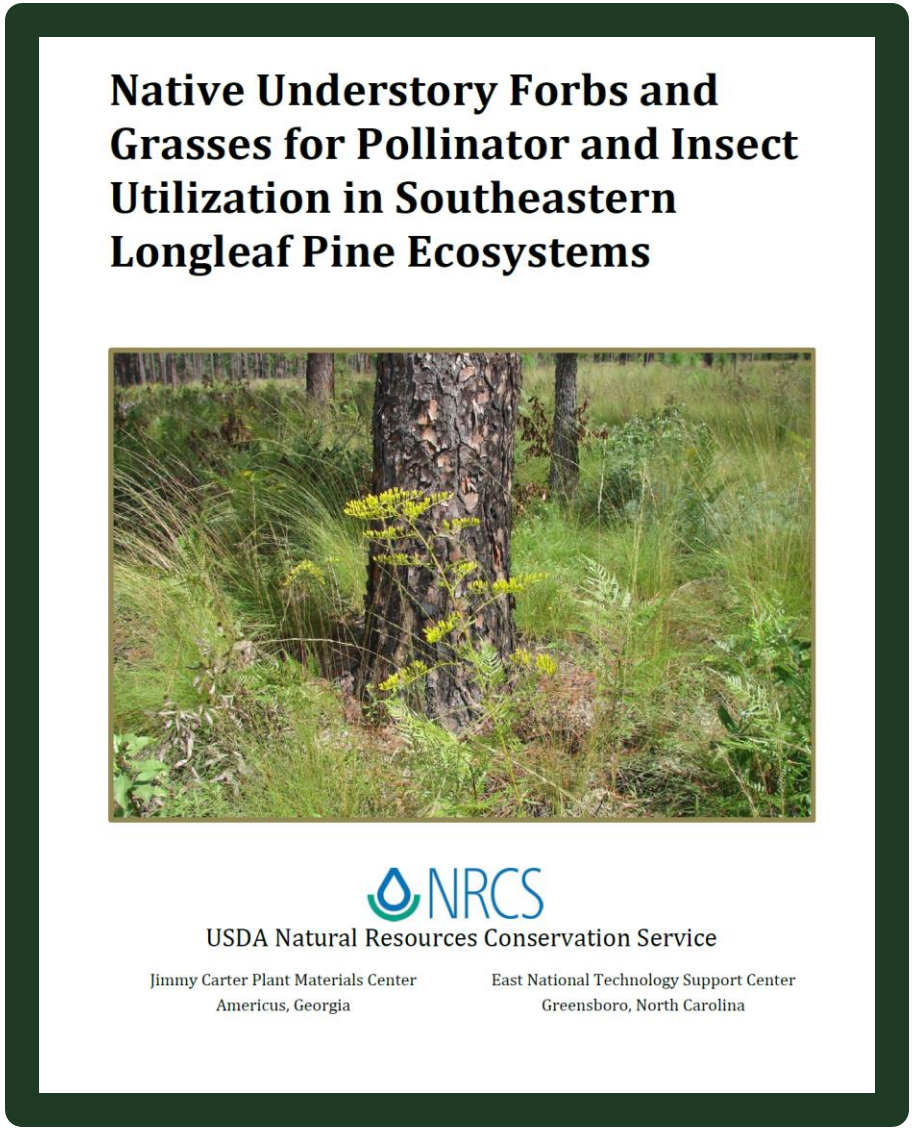
- Research suggests that there are higher abundances and diversity of bees in burned areas
- Frequently burned longleaf understory has high diversity -- provides food for adults and larvae and nesting areas
- Rotational burning is best, leaving refugia for insect larvae, pupae, and adults.

Farm Bill Programs (NRCS): Technical assistance

EQIP Environmental Quality Incentives Program

CSP Conservation Stewardship Program

WLFW Working Lands for Wildlife (targeted locales)



Lisa Lord
lisa@longleafalliance.org