Flower power: feeding the bees and other beneficial insects on blueberry farms

Bodie Pennisi and

Jason Schmidt

University of Georgia – Horticulture and Entomology

UNIVERSITY OF GEORGIA

USDA NRCS

BLUEBERRY WILDFLOWERS POLLINATORS

We've established many sites for experimental "gardens" for growing native plants for pollinators, and for monitoring pollinators attracted

With perennial native plants takes time and space to set up and monitor the "behavior" and insect attraction

We also work with seeding strategies, and many of the plants are transplanted from farmland, grown in greenhouses, and then transplanted back into experimental plots to monitor "behavior" and insect attraction

Building areas for bees and beneficials can occur in many areas

Over the last three years we partnered with blueberry growers to establish pollinator habitat on farms

- ✓ Unexploited potential to increase yield per acre by boosting pollination and fruit set
- ✓ Reduce pesticide inputs
- ✓ While managed honey bees and bumble bees have been traditionally used, blueberries are better pollinated by the wild bee populations.
- ✓ Planting floral resources and highlighting existing native flora, can increase biodiversity of wild pollinators (i.e. bees, wasps, flies, beetles, butterflies) and natural enemies of pests, which can provide increased benefits in the overall crop yield.

native bee

What We Are Hoping To Achieve

- ✓ Improve and expand adoption of wildflower plantings and flowering plants for promoting pollinators and biological control.
- ✓ Improve strategies for wildflower establishment from seed and transplant sources in blueberry fields located in southeast Georgia.
- ✓ Characterize and identify wild bee communities.
- ✓ Inventory native flora on blueberry fields which could serve as floral resource for insects.

Our Team

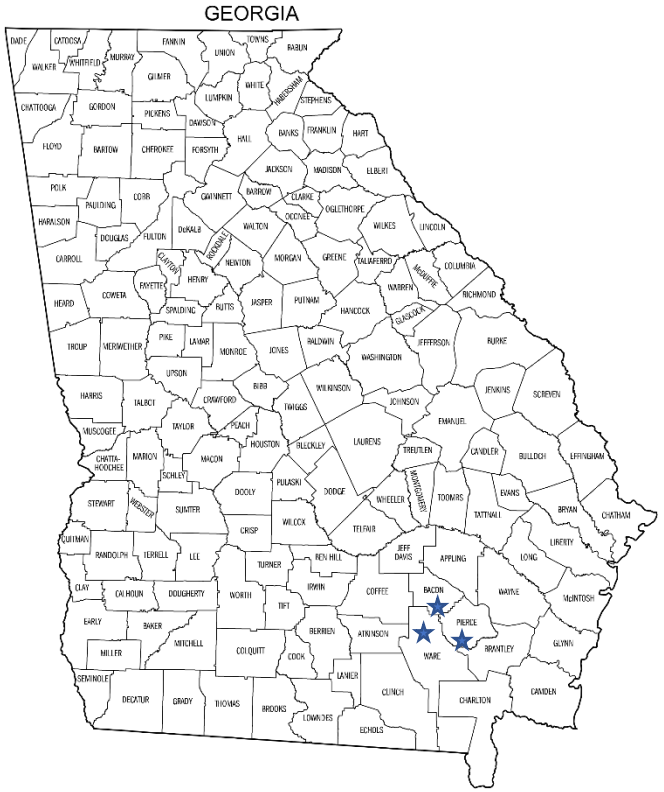
UGA Depts. of Horticulture & Entomology
UGA Extension

USDA-NRCS

Woodard & Curran

<u>Farms:</u>

Bennett, Bell, Wildes, Wade



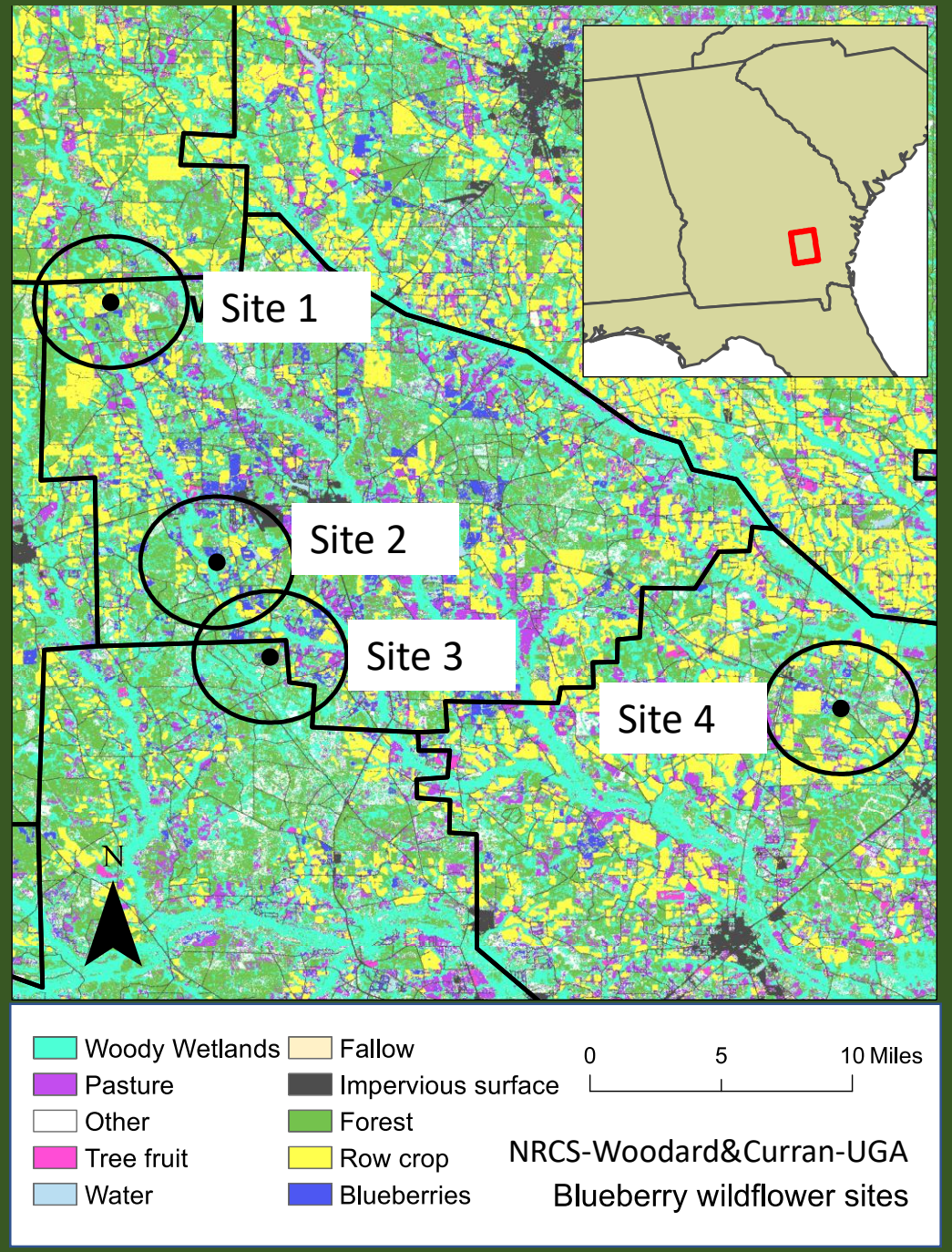
Initial sites for building and demonstrating habitat enhancement technologies for blueberry production – goals:

-enhance pollination services

-enhance pest management

NRCS

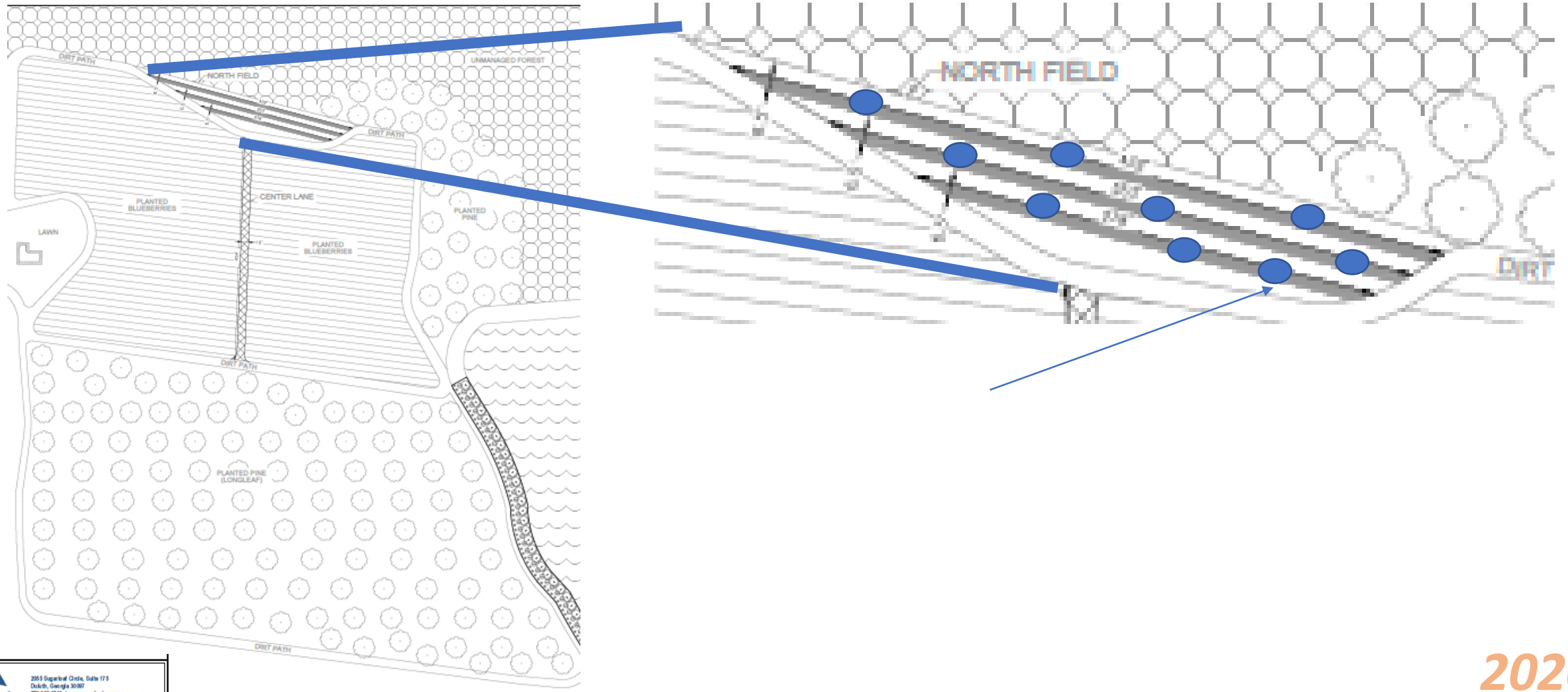
UNIVERSITY OF GEORGIA
College of Agricultural & Environmental Sciences



How We Are Doing It

- We planted wildflower strips, perennial transplants, and shrub and tree border in 2021.
- We sampled monthly to assess seed emergence, number of blooms, and plant establishment.
- We inventoried native flora and monitored for bloom phenology and abundance.
- We sampled bees monthly with vane traps (March-Oct, 2021).

Wildes Farm habitat: north strips



WOODARD & CURRAN
2055 Sugarloaf Circle, Suite 175
Duluth, Georgia 30097
770.822.6796 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

2020

wildflowers strips in border

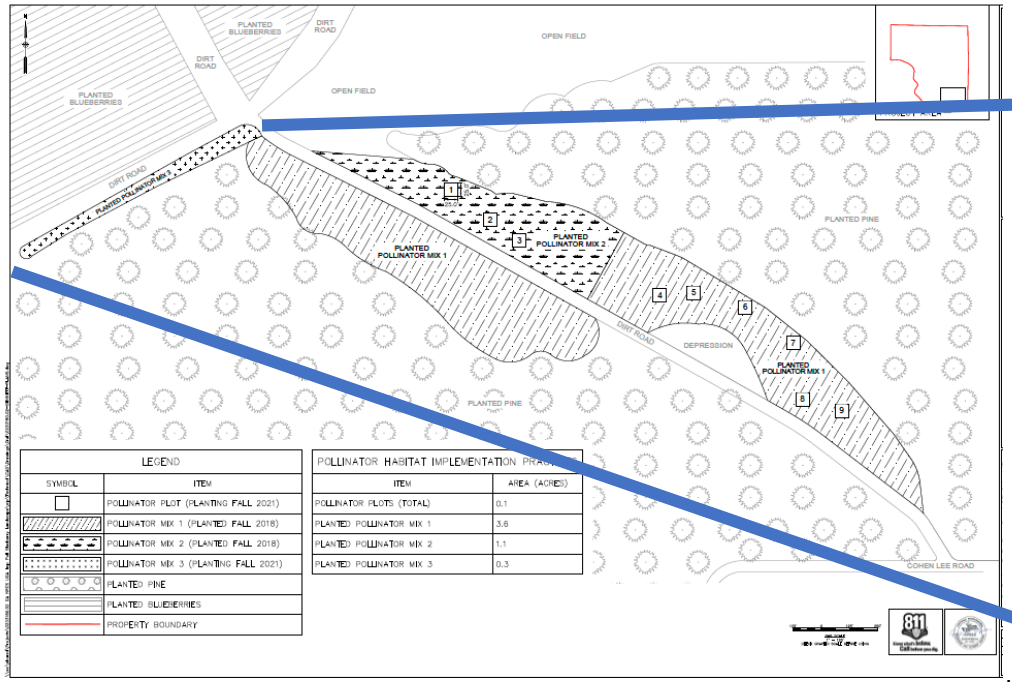
2021

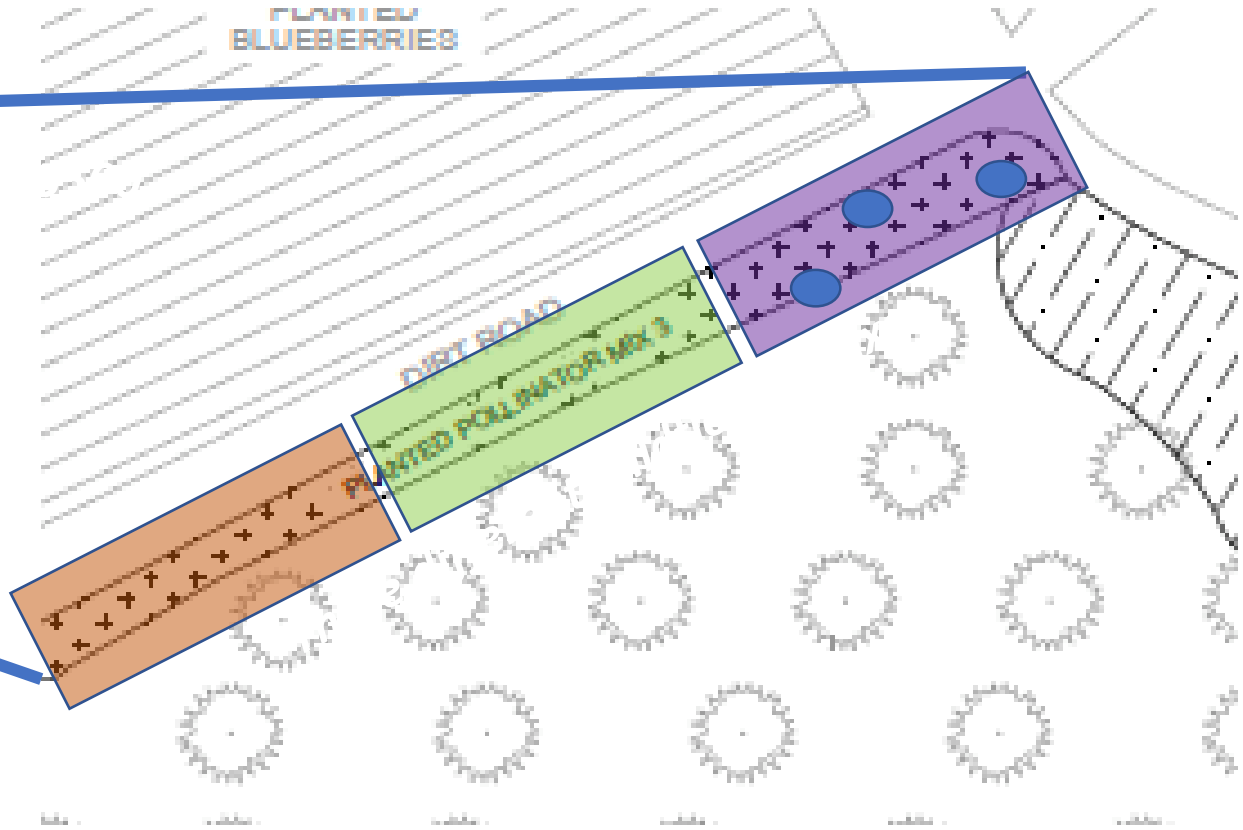
Wildes Farm habitat: center corridor

2021


shrub and tree border

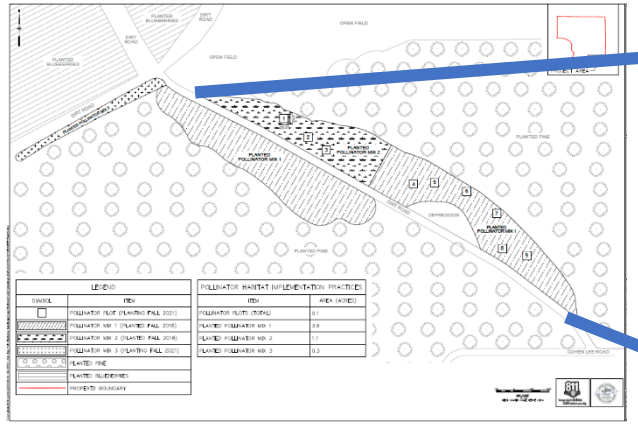
Bennett Farm habitat: border mixes

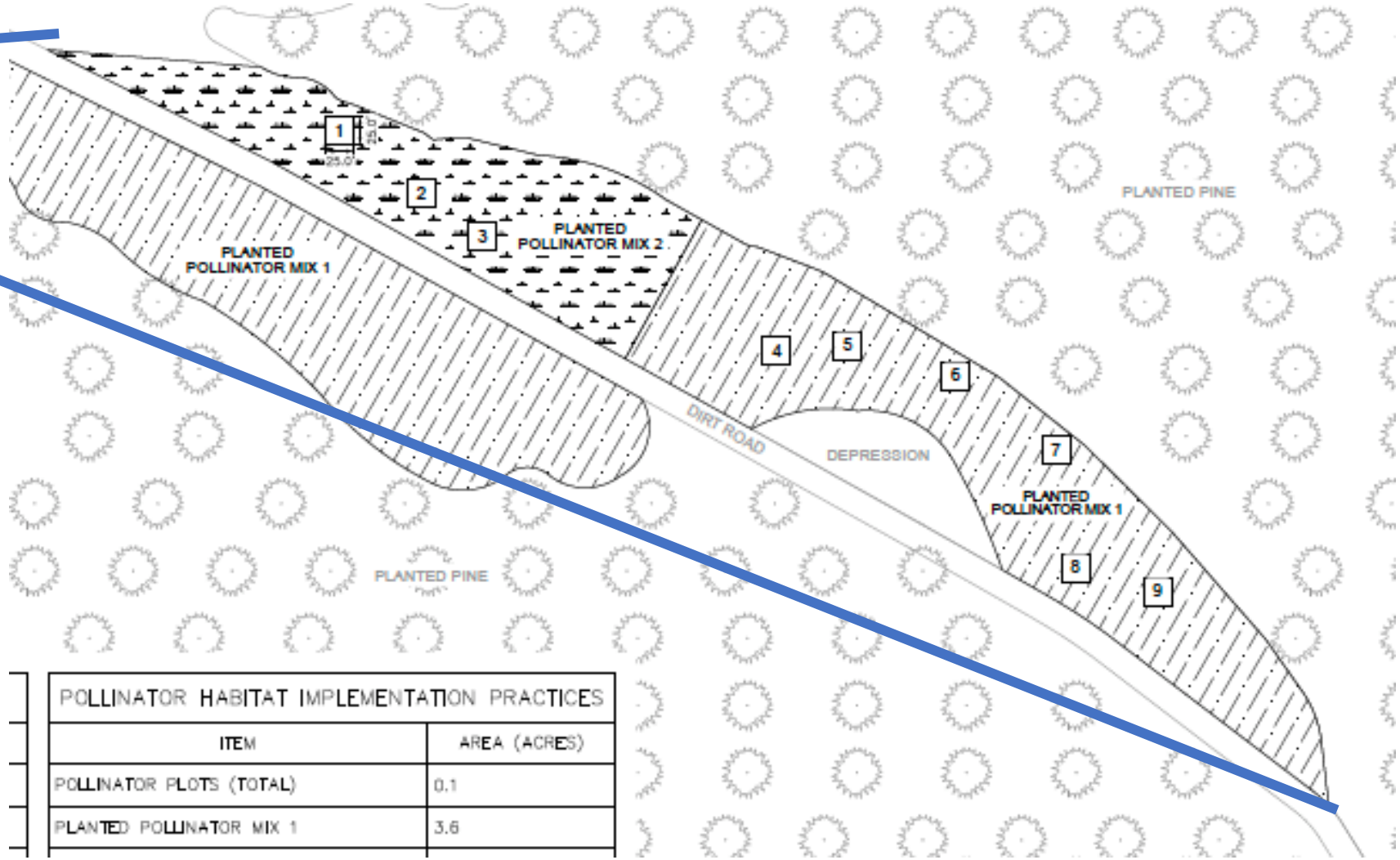




2021

Bennett Farm habitat:
augmentation plots (seed vs. transplants)





POLLINATOR HABITAT IMPLEMENTATION PRACTICES	
ITEM	AREA (ACRES)
POLLINATOR PLOTS (TOTAL)	0.1
PLANTED POLLINATOR MIX 1	3.6

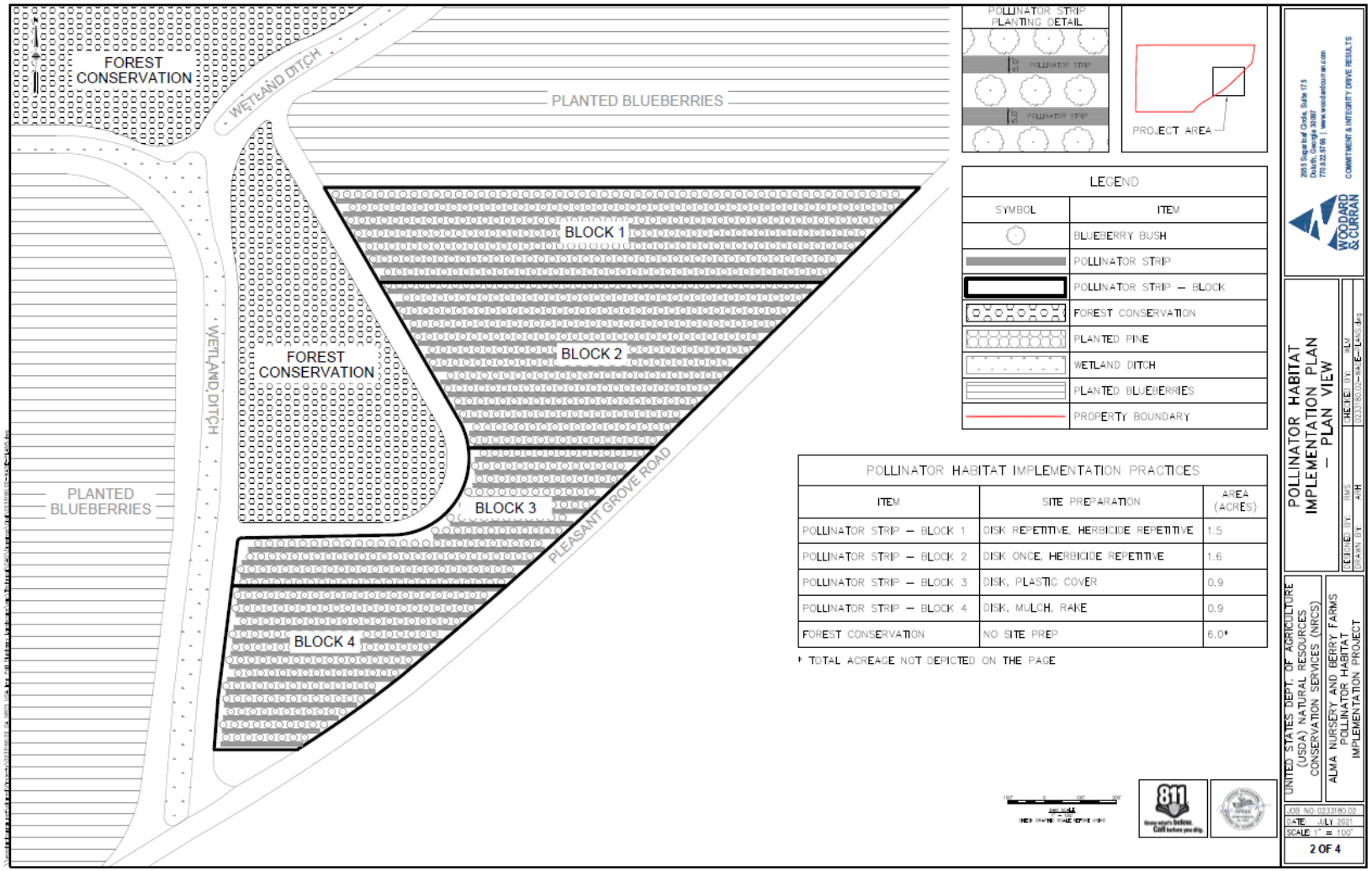
2055 Sugarloaf Circle, Suite 175
Duluth, Georgia 30097
770.822.8766 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

2021

same species seed

single-species transplants

Wade Farm habitat: in-crop planting



2022

Bell Farm habitat: biodiversity & eco-tourism

wildflower transplants located in beds near blueberry fields; optimized for viewing

2023

Results (2021-2023)

WILDES FARM: wildflower strips along field border

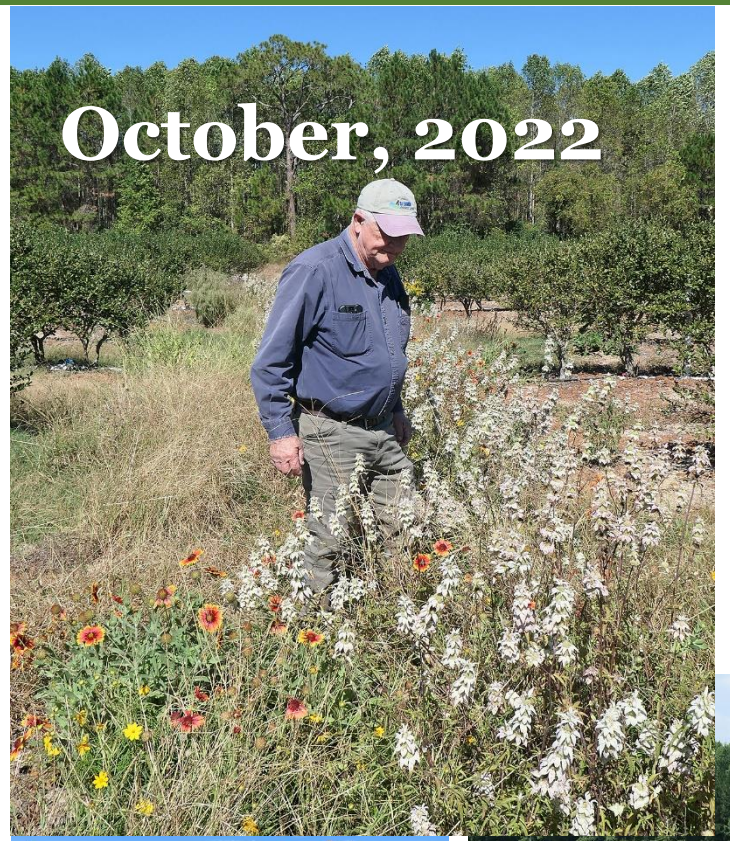
Average number of blooms

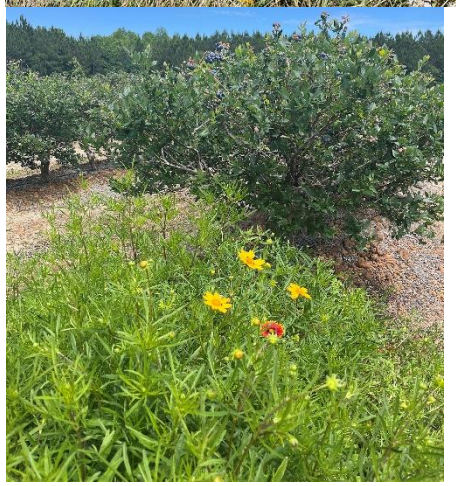
Species	Average no. blooms/ 30 ft²
black-eyed Susan	127
Indian blanket	86
swamp sunflower	98
tickseed	1
partridge pea	4
dotted mint	117

WILDES FARM: wildflower strips in central row

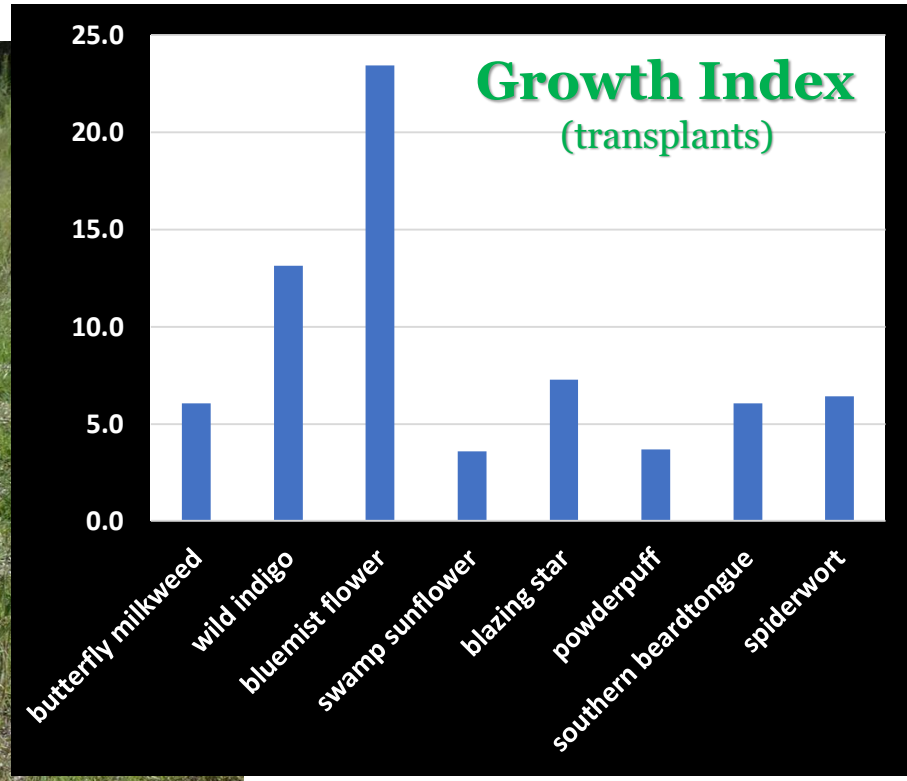
Species	Average no. blooms/ 24 ft²
black-eyed Susan	14
Indian blanket	43
tickseed	21
partridge pea	7
dotted mint	176

Average number of blooms





BENNETT FARM: Single-species transplants



BENNETT FARM: Single-species transplants vs. seed

beardtongue

BENNETT FARM: single-species seeds

swamp sunflower

BENNETT FARM: Seed mixes

WADE FARM: in-crop planting


February, 2023
seed drilled

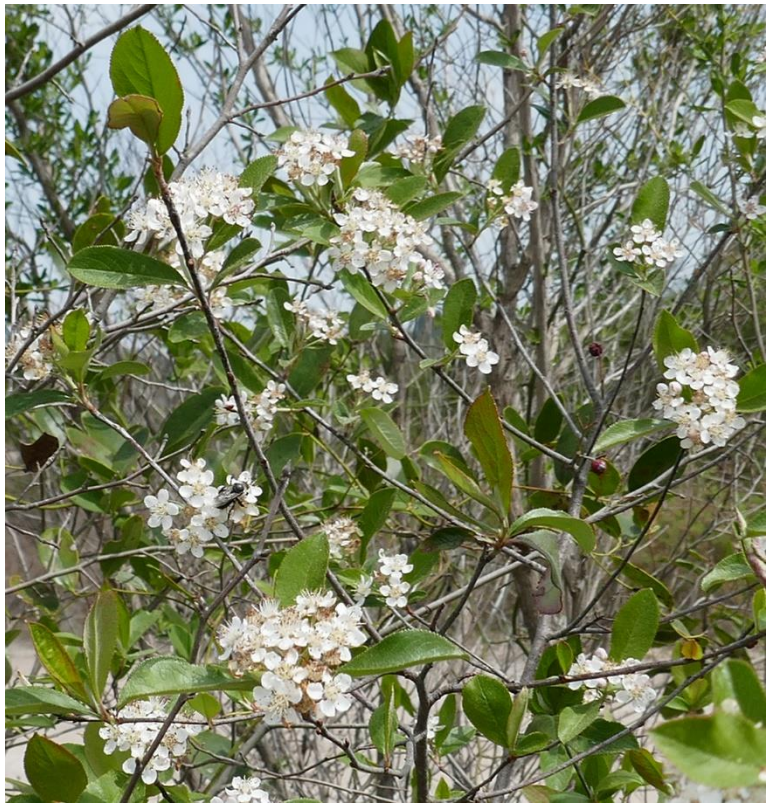
BELL FARM: Seed mixes

Similar to Wade farm, between row seed mixes did not do well – further work needed on integration

Bell Farm habitat: biodiversity & eco-tourism

Native flora: shrubs and trees

red chokeberry



swamp titi

gallberry

Native flora:

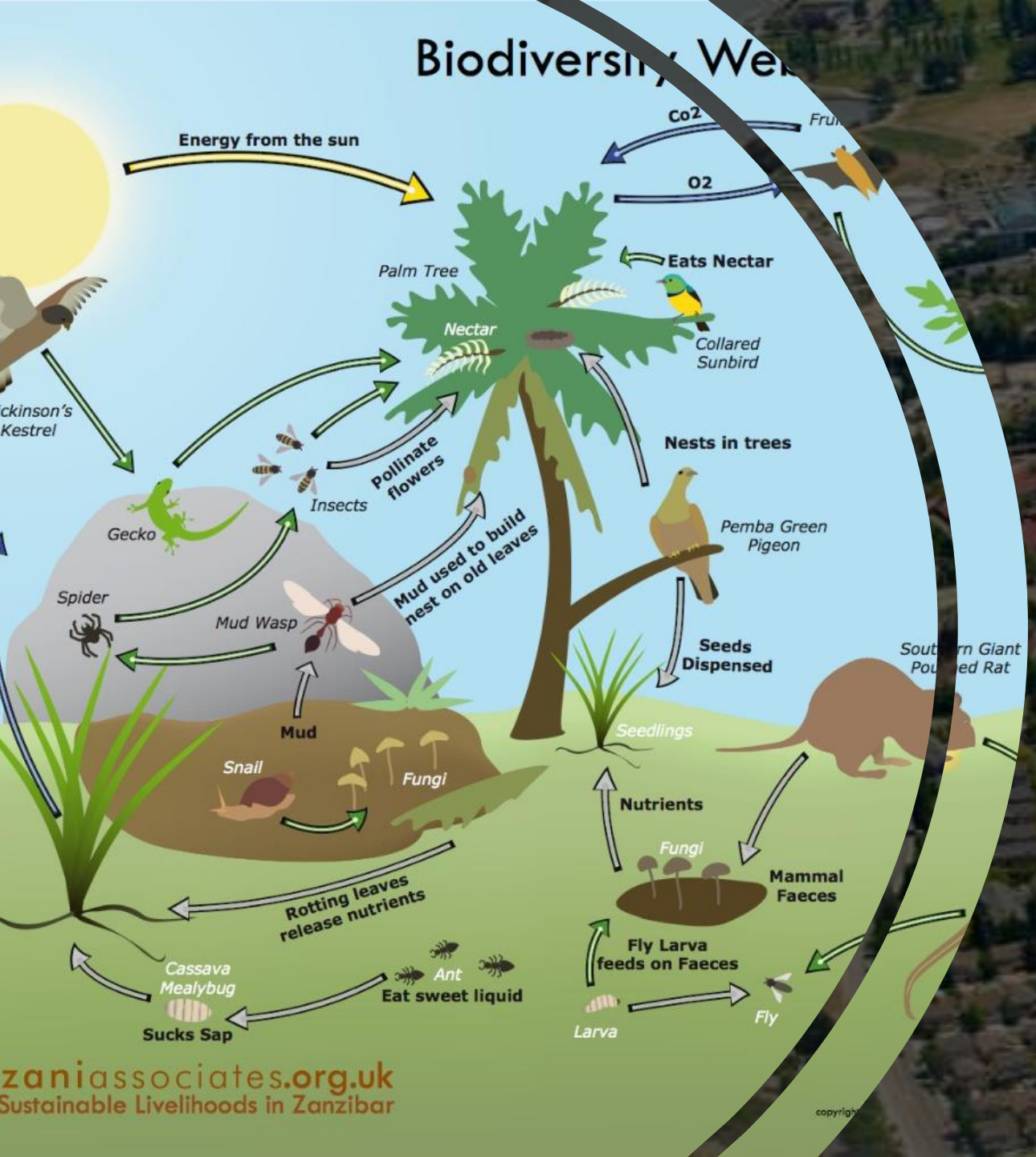
swamp sunflower

false foxglove

Native flora: narrowleaf silkgrass goldentop


Carolina redroot

We also work with seeding strategies, and many of the plants are transplanted from farmland, grown in greenhouses, and then transplanted back into experimental plots to monitor "behavior" and insect attraction



Insects are integral to agriculture and human productivity

Summary:

- Insects and other arthropods are integral to crop success.
- Need knowledge of species and matching of plants to help foster their populations.
- ***Beneficials require habitat – how to begin considering conservation and habitat enhancements for beneficials***

https://www.xerces.org/pollinator-conservation/habitat-installation-guides

Thank you!