Plateau
Land & Wildlife
Management

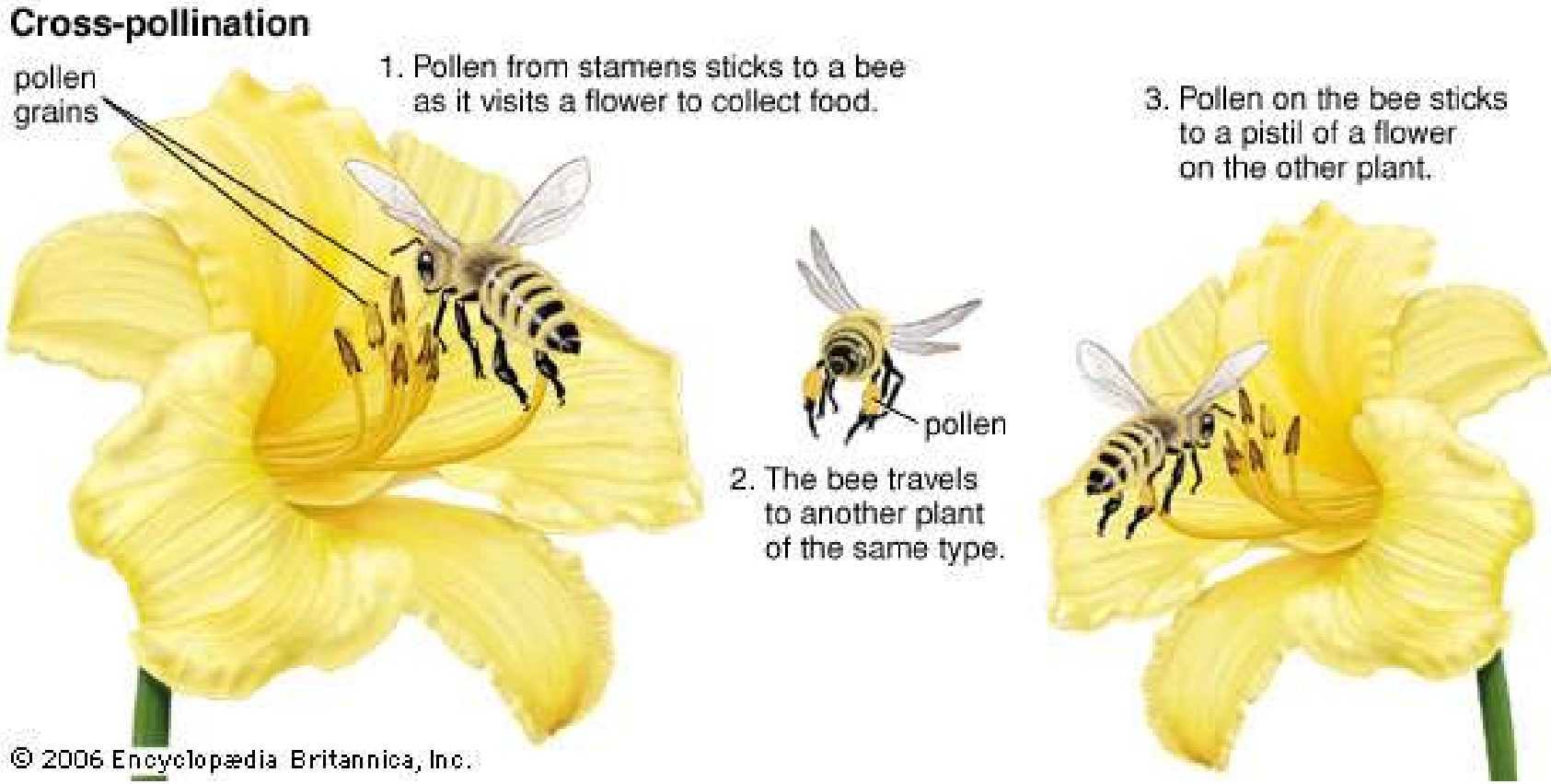
Butterflies, Wasps and Bees, Oh My! How to manage for native pollinators

James A. Hall, CWB®
Plateau Land & Wildlife Management
Staff Biologist II

What is pollination?

Plateau
Land & Wildlife Management

The act of transferring pollen grains from the male parts (stamen) to the female parts (pistil) of a flowering plant = fertilization



Who are the pollinators?

Plateau
Land & Wildlife Management

- Bees
- Butterflies
- Moths
- Wasps
- Flies
- Beetles
- Bats
- Birds
- Wind

Photo credit: Lee Kothmann

Photo credit: John Hall

Bees

Plateau
Land & Wildlife Management

Bees

Plateau
Land & Wildlife
Management

Native species

- 3,500 in North America alone
- Most are solitary species
  - No communal effort in reproduction, raising young, protection from predators
  - When a female solitary bee dies, entire reproductive effort is lost
  - More vulnerable to threats, mortality

Bees – North America

Plateau
Land & Wildlife
Management

Managed / Non-native

- 30 species
- European honeybee, both managed and feral colonies
- Widespread managed pollination
    - Billions of dollars worth in annual crop yields

Butterflies

Plateau
Land & Wildlife
Management

Butterflies

Plateau
Land & Wildlife
Management

Monarch Butterfly *(Danaus plexippus)*

- Migrate thousands of miles annually from Central Mexico to Canada
- Spring breeding areas throughout Texas
- Life cycle reliant on milkweed

Why are pollinators important?

Plateau
Land & Wildlife Management

Critical to native ecosystems

- Pollinators help create and maintain habitats and ecosystems
- 80% of all plants are pollinated
- Pollinators facilitate the reproduction of 90% of the world's flowering plants

Why are pollinators important?

Plateau
Land & Wildlife
Management

Critical to humans globally

- ¾ of world's crops require pollination
- Human population growth is exponential
  - 9.7 billion by 2050 (currently 7.3 billion)
  - 300% increase of agricultural reliance on pollinators since 1961
- Economic value of pollinators annually
  - $235 - $577 billion

Intergovernmental Platform on Biodiversity and Ecosystem Services

Pollinator decline

Plateau
Land & Wildlife
Management

Public knowledge about decline in both native and managed species

In Texas, several native species have been designated by TPWD as Species of Greatest Conservation Need (SGCN)

Pollinator decline

Plateau
Land & Wildlife
Management

Multiple causes:

- Introduced diseases and parasites
- Industrial agriculture – insecticides, herbicides
- Habitat loss / fragmentation

What can we do?

What can we do?

Plateau
Land & Wildlife
Management

- Texas is close to 95% privately owned
- 142 million acres of farms, ranches, forests
  (Texas Land Trends, 2014)
- Landowners can play significant role
- Requires incentive-based programs

Managing for native pollinators

Plateau
Land & Wildlife
Management

Wildlife Management (1-d-1 open space valuation)

- Form of special agricultural valuation
- Provides same tax status as traditional agricultural use
- Specifically targeting breeding, migratory, wintering, and resident native wildlife species

Managing for native pollinators

Plateau
Land & Wildlife
Management

Wildlife Management (1-d-1 open space valuation)

- Most management activities will qualify
- Requires a **wildlife management plan**
- Most activities benefit other wildlife as well
  - Native birds, mammals, reptiles, amphibians, invertebrates
- Native pollinators only (not European honeybee)

Wildlife management for native pollinators

Plateau
Land & Wildlife
Management

Seven categories of Wildlife Management:

1. Habitat control
2. Erosion control
3. Predator control
4. Supplemental water
5. Supplemental food
6. Supplemental shelter
7. Census counts

I. Habitat control

Plateau
Land & Wildlife
Management

Grazing management

- Deferment, rotation, timing
- Proper grazing regime can encourage wildflowers, natives grasses, etc.
- Grazing should be closely monitored to determine condition of land
- Prevent grazing during mid-late summer
- Rest

I. Habitat control

Plateau
Land & Wildlife
Management

Prescribed burning

- Experts should be employed to plan and perform burn (NRCS, private consultant)
- Conducted from fall into early spring
- Burning prior to or just after green-up encourages grass species – burning in conjunction with grazing will aid in forb production
- Burn only 30% of site each year
- Rotation

I. Habitat control

Range enhancement (reseeding)

- Plant diversity is key
- Use multiple species when seeding
- Plant for multiple seasons
- Bunchgrasses are important
- Annual monitoring / survey of existing plants
- Proper seedbed preparation
- At least 10% of designated area should be planted each year to qualify

Plateau
Land & Wildlife Management

I. Habitat control

Plateau
Land & Wildlife
Management

Brush management

- Control of woody plant encroachment
- Precursor to reseeding / range recovery
- Ideally conducted outside the flowering season
- Selective control, not clear-cutting (in most cases)
- At least 10% of designated area should be cleared or manipulated each year to qualify

I. Habitat control

Plateau
Land & Wildlife
Management

Riparian management and enhancement

- Riparian is related to corridors along rivers, streams, creeks, lakes, ponds and wetlands
- Fencing of riparian corridors
- Complete or partial deferment of livestock
- Planting / establishment of native herbaceous plants, shrubs, and trees
- One project qualifies for 10 years

I. Habitat control

Plateau
Land & Wildlife
Management

Habitat protection for species of concern

- Planned protection and management of “species of concern” (e.g. declining monarch butterfly or American bumblebee)
- Variety of activities in combined conservation effort
  - Protection of existing habitat
  - Planting new habitat
  - Monitoring target species (e.g. Texas Monarch Watch)

I. Habitat control

Plateau
Land & Wildlife
Management

Prescribed control of species

- Removal or control of non-native vegetation
- Bermudagrass / King Rach bluestem pasture conversion to native grassland
- Control of non-native trees and shrubs
- At least 10% of designated area should be treated or manipulated each year to qualify

II. Erosion control

Plateau
Land & Wildlife Management

Streamside, pond, wetland revegetation

- Similar to riparian enhancement
- Revegetation native grasses, forbs, shrubs and trees to aid in erosion will also benefit pollinators
- Planting after pond construction or other erosion control work
- One project will qualify for 10 years

III. Predator control

Plateau
Land & Wildlife Management

Feral hogs – damage habitat and floral host plants

- Hunting and trapping
- Exclusionary fencing

Imported Red Fire Ants – prey on native insect populations

- Individual mound treatment or broadcasting
- 10 acres or 10% of infested area per year, whichever is larger

IV. Supplemental water

- Water is critical for pollinators just like other wildlife
- Nectar is not enough
- Existing bodies or water don't typically qualify
- Trough, guzzler, etc.
- Access and escape ramp
- One water source qualifies for 10 years credit

V. Supplemental food

- Grazing management
- Prescribed burning
- Range enhancement (reseeding)
- Food plots
  - Annual plots
  - Exclude from livestock and feral hogs
  - Minimum 1% of total acreage annually

VI. Supplemental shelter

Plateau
Land & Wildlife Management

Brush piles

- Material from brush management activity
- Stacked and retained
- Benefits many solitary bee species and bumble bees

Woody plant / shrub establishment

- Allowing the establishment of cover-producing plants
- Hollow or pithy stems (box elder, sunflower, sumac, yucca, ironweed, etc.
- Tunnel-nesting bees
- Minimum 1% of designated area treated annually

VI. Supplemental shelter

Plateau
Land & Wildlife Management

Natural cavity / snag development

- Creation or retention of dead trees or “snags”
- At least five snags on 5% of designated acreage must be created / retained annually

Strip mowing

- Cool-season strip mowing
- Encourages wildflowers, seasons forbs
- Mow at least 1/3 of area each year

VII. Census

Plateau
Land & Wildlife
Management

Surveys

- Gauge success / efficacy of management efforts
- Allows informed management decisions
- Multi-season, multi-year
- Identification of species requires experience

VII. Census

Plateau
Land & Wildlife
Management

Census and monitoring of non-game wildlife

- Annual, seasonal check list, “wildlife journal”
- Citizen science:
  - Bee monitoring protocol (Xerces Society)
  - Monarch Butterfly monitoring (USFWS)
    - Monarch Watch, Monarch Larval Monitoring project
  - iNaturalist – bees and wasps of Texas

Other incentive-based programs

Plateau
Land & Wildlife
Management

National Fish & Wildlife Foundation

- Monarch Butterfly & Pollinators Conservation Fund

  http://www.nfwf.org/monarch/Pages/home.aspx

NRCS Farm Bill programs

- Monarch Butterfly Habitat Development Project
- Environmental Quality Incentives Program (EQIP)
- Conservation Stewardship Program

  https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/plantsanimals/pollinate/?cid=nrcseprd402207

TPWD Landowner Incentive Program (LIP)

https://tpwd.texas.gov/landwater/land/private/lip/

Other useful links

Plateau
Land & Wildlife
Management

- Xerxes Society Surveys: https://xerces.org/
- US Fish and Wildlife Service: https://www.fws.gov/savethemonarch/
- TPWD: https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/native-pollinators/
- Native American Seed: http://www.seedsource.com/

How can Plateau help?

Plateau
Land & Wildlife
Management

Technical assistance and implementation

- On-site habitat assessments and consultation
- Preparation of wildlife management plans
- Conduct wildlife surveys
- Agricultural valuation applications and bee plans

Family of Companies

Plateau
Land & Wildlife
Management

BRAUN & GRESHAM
ATTORNEYS AT LAW

PLATEAU
LANDGROUP

1031 PLATEAU
EXCHANGE

Thank you!

Plateau Land & Wildlife Management

James A Hall, CWB®
Staff Biologist II

(512) 894-3479
jhall@plateauwildlife.com

plateauwildlife.com
plateau@plateauwildlife.com