Landscaping for Pollinators as a Restoration Practice

Marirose Kuhlman, Missoula County Dept of Ecology & Extension

OUTLINE

Bee diversity overview

Pollinator/insect declines

Conservation in towns?

Lawns, native plants and “keystone species”

Honey bee PSA








Wild bees are the world’s most important pollinators

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NATIVE BEES ARE SUPER DIVERSE

How many bee species?

20,000 worldwide

4,000 in North America

600+ in Montana (230+ in Missoula Co.)

Nest preferences (70% ground)

Flower preferences (specialist/generalists)

Social structure (90% solitary!)

Honey bees are unique (and non-native!)

Central-place foragers – like birds!

Parallel Declines in Pollinators and Insect-Pollinated Plants in Britain and the Netherlands

J. C. Biesmeijer,[1*] S. P. M. Roberts,[2] M. Reemer,[3] R. Ohlemüller,[4] M. Edwards,[5] T. Peeters,[3]
A. P. Schaffers,[7] S. G. Potts,[2] R. Kleukers,[3] C. D. Thomas,[4] J. Settele,[8] W. E. Kunin[1]

Bee declines driven by combined stress from parasites, pesticides, and lack of flowers

Dave Goulson,* Elizabeth Nicholls, Cristina Botías, Ellen L. Rotheray

Patterns of widespread decline in North American bumble bees

Sydney A. Cameron[a,1], Jeffrey D. Lozier[a], James P. Strange[b], Jonathan B. Koch[b,c]
and Terry L. Griswold[b]

[a]Department of Entomology and Institute for Genomic Biology, University of Illinois, Urbana, IL 61801; [b]U
Research Service Pollinating Insects Research Unit, Utah State University, Logan, UT 84322; [c]Department
and [d]Illinois Natural History Survey, Institute of Natural Resource Sustainability, University of Illinois, Ch

Insect Conservation and Diversity (2020) **13,** 595–605 doi: 10.1111/icad.12429

Wild bee declines linked to plant-pollinator network changes and plant species introductions

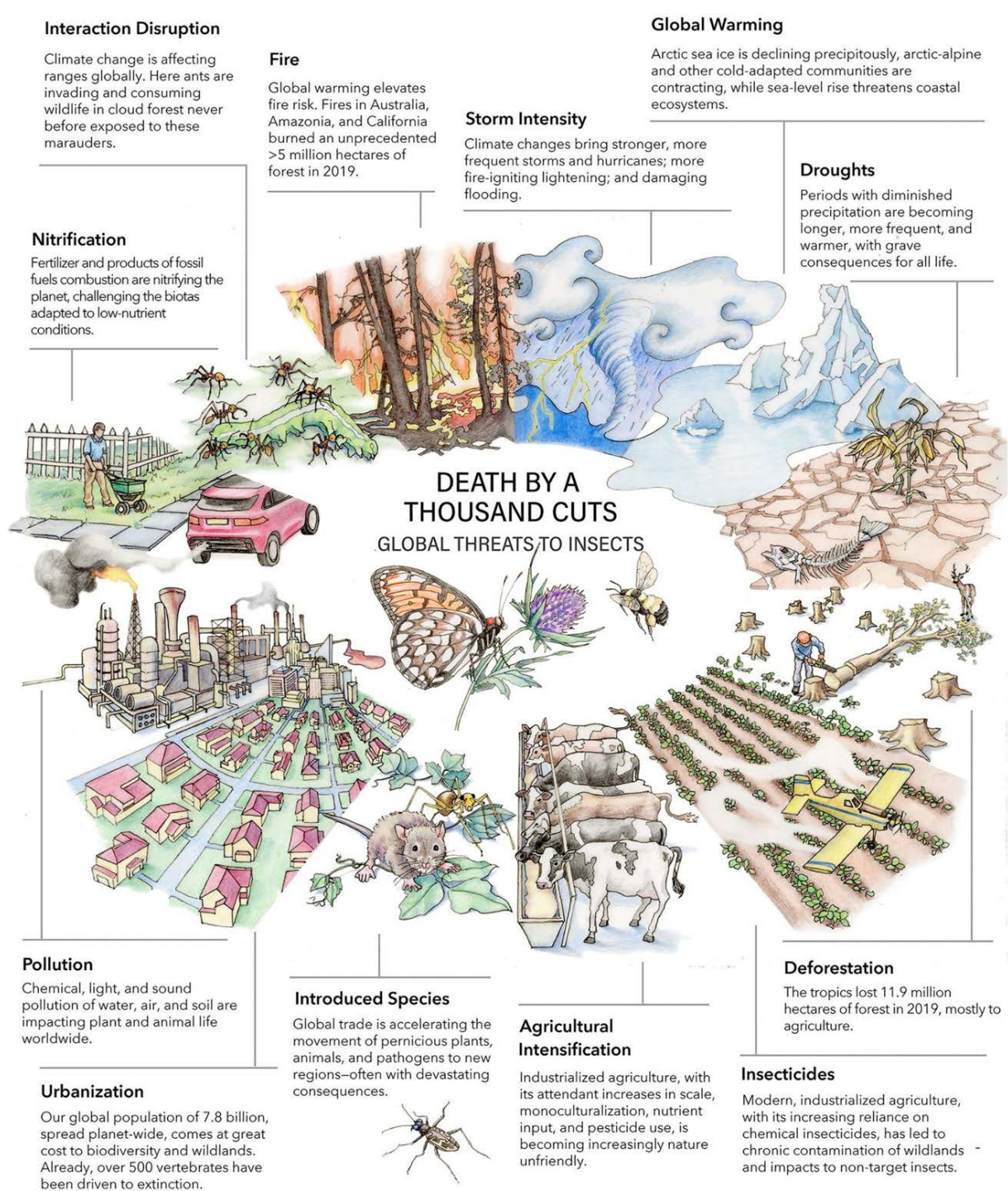
IASSON[1] and SANDRA M. REHAN[2] [1]Department of Biological Sciences,
e, Durham, NH, USA and [2]Department of Biology, York University, Toronto, ON, Canada

PNAS RESEARCH ARTICLE | ECOLOGY OPEN ACCESS

Recent and future declines of a historically widespread pollinator linked to climate, land cover, and pesticides

William M. Janousek[a,1,2], Margaret R. Douglas[b], Syd Cannings[c], Marion A. Clément[d], Casey M. Delphia[e], Jeffrey G. Everett[f], Richard G. Hatfield[g],
Douglas A. Keinath[d], Jonathan B. Uhuad Koch[h], Lindsie M. McCabe[h], John M. Mola[i], Jane E. Ogilvie[j], Imtiaz Rangwala[k], Leif L. Richardson[g],
Ashley T. Rohde[h], James P. Strange[l], Lusha M. Tronstad[m], and Tabitha A. Graves[a,1]

Edited by Brian D. Inouye, Florida State University, Tallahassee, FL; received July 13, 2022; accepted November 1, 2022 by Editorial Board Member Susan P. Harrison



Wagner, et al (2021). PNAS 118(2).

Urban and suburban land-use types are the *fastest growing ecosystems* in the world.

But *can* support a surprising richness and abundance of bees!

Tonnietto, et al (2011); Hall, et al (2017).

https://commons.wikimedia.org/wiki/File:Aerial,_Indian_Creek_near_Dallas_(6039814731).jpg#/media/File:Aerial,_Indian_Creek_near_Dallas_(6039814731).jpg

Urban areas as restoration sites

"Intensifying conservation efforts for urban insect pollinators constitutes an opportunity for meaningful urban conservation." *Hall, et al (2017).*

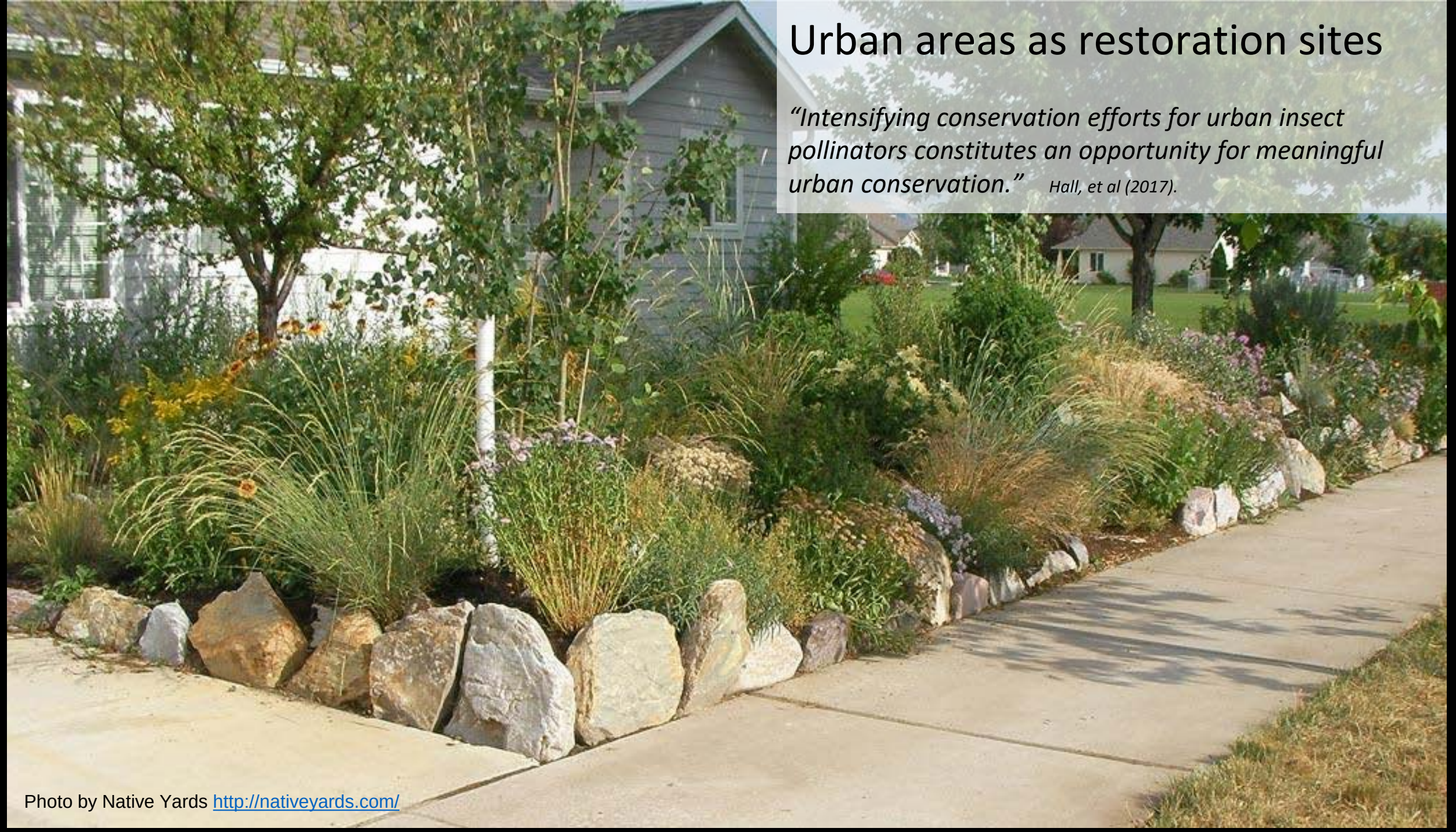
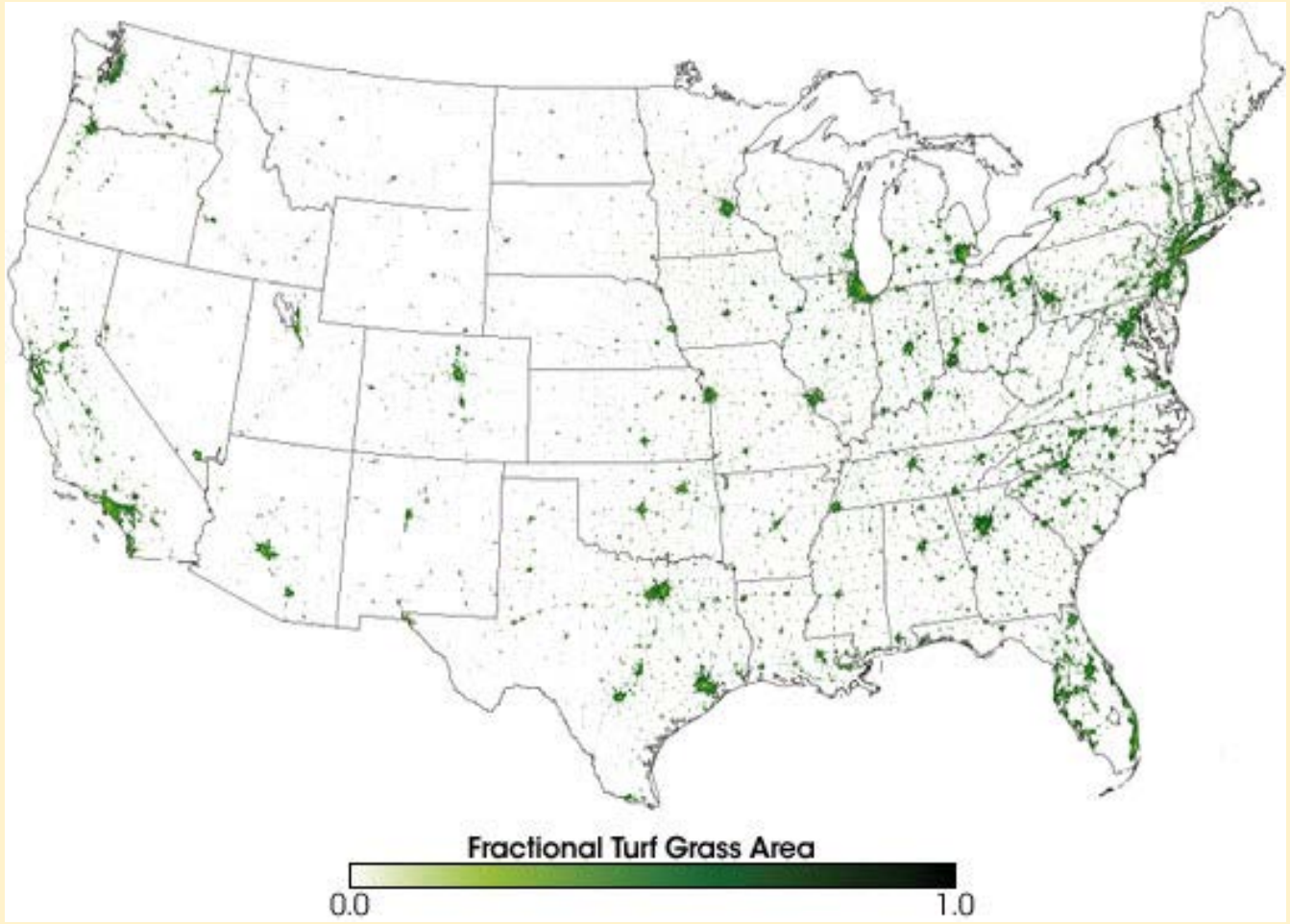


Photo by Native Yards http://nativeyards.com/

Lawns occupy 2% of the surface area of the continental United States

3x more acreage of irrigated lawn than corn



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9 BILLIONS gals water used *each day*, mostly for residential irrigation

- **50% of that water is lost or wasted**

https://www.ttownmedia.com/tracy_press/news/water-restrictions-take-effect/article_0d00e220-2746-11e5-8bb8-17972fcb5bbc.html

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800 million gals fuel burned + 17 million gal *spilled* each year
- **5% of total air pollution in US**

https://lawnmowerguru.com/wp-content/uploads/2021/07/Can-You-Run-a-Lawn-Mower-Without-A-Gas-Cap.png

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70 million lbs fertilizer
(10x more than are used on crops)

125 million lbs pesticides, mostly herbicides

https://www.naturalgreenlawnandpest.com/blog/most-common-questions-professional-weed-control-maryland

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70 hrs/person/year on lawns

https://westseattleblog.com/2020/05/neighborhoods-pitching-in-at-a-park/

https://www.missoulaevents.com/08/21/2021/snap-communications-presents-live-music-da-zoo-byob/

Missoula County Flowering Lawn Project

- U of MN Extension Bee Lawn Program
- Application process - over 90 applicants in 2022!
- 2 yr commitment
- Flowering Lawn seed for 400 sqft
- Attend 3 workshops
- Provide us with info!

Flowering Lawns

Typical turfgrasses mixed with flowers
Low-growing, resilient to foot traffic
Less watering
Less mowing
No additional fertilizer
NO HERBICIDES OR INSECTICIDES

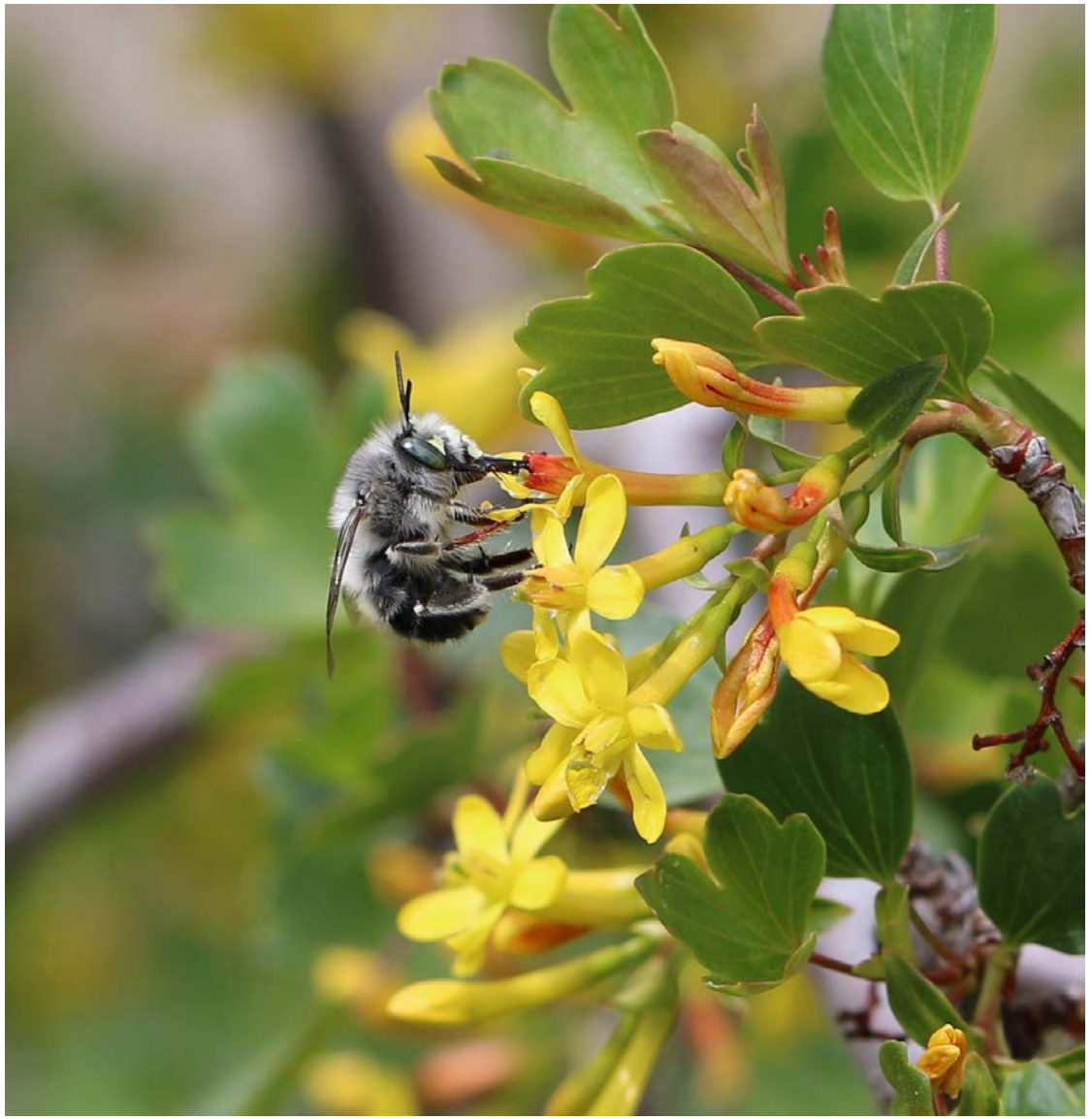

Native grassland near Florence, Montana

ReWild Your Yard!

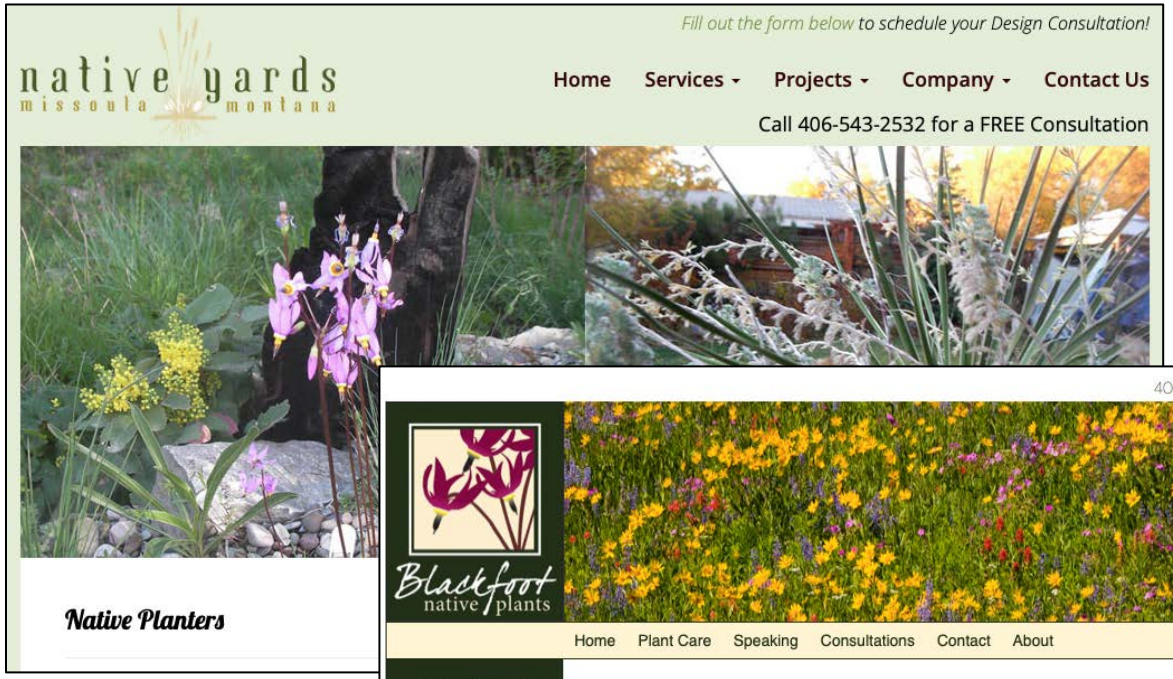
Missoula County

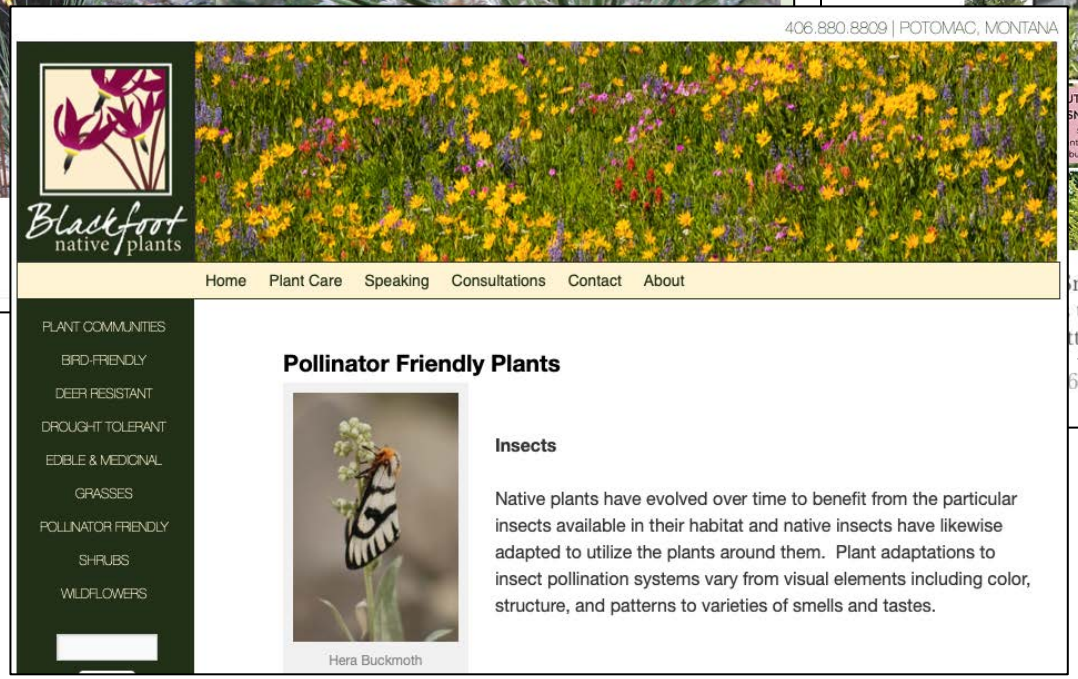
DEPARTMENT OF ECOLOGY & EXTENSION

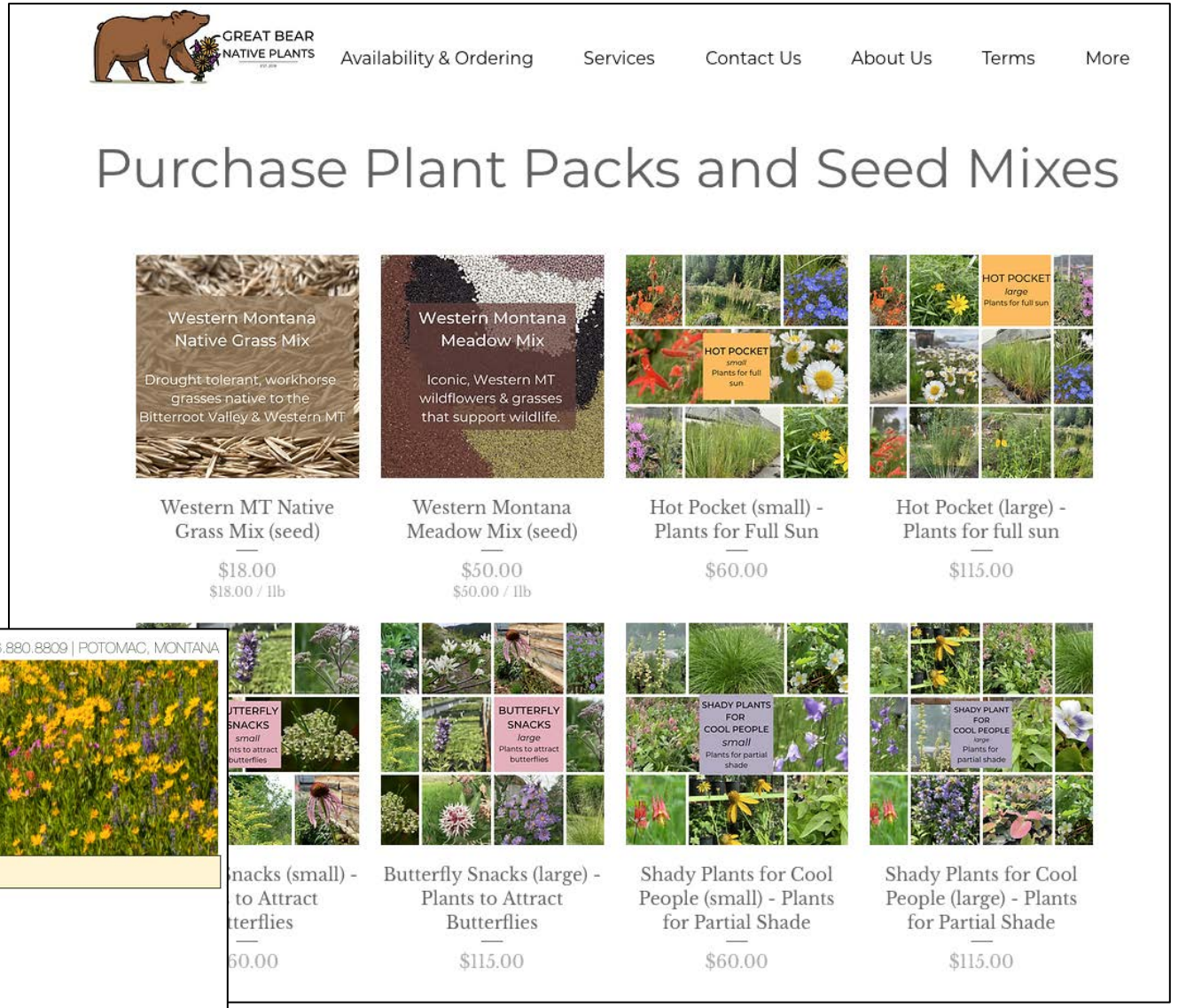
“**Keystone plants**” - *native plants critical to food webs and that are necessary for many species to complete their life cycles.*



Partnerships with local native plant nurseries

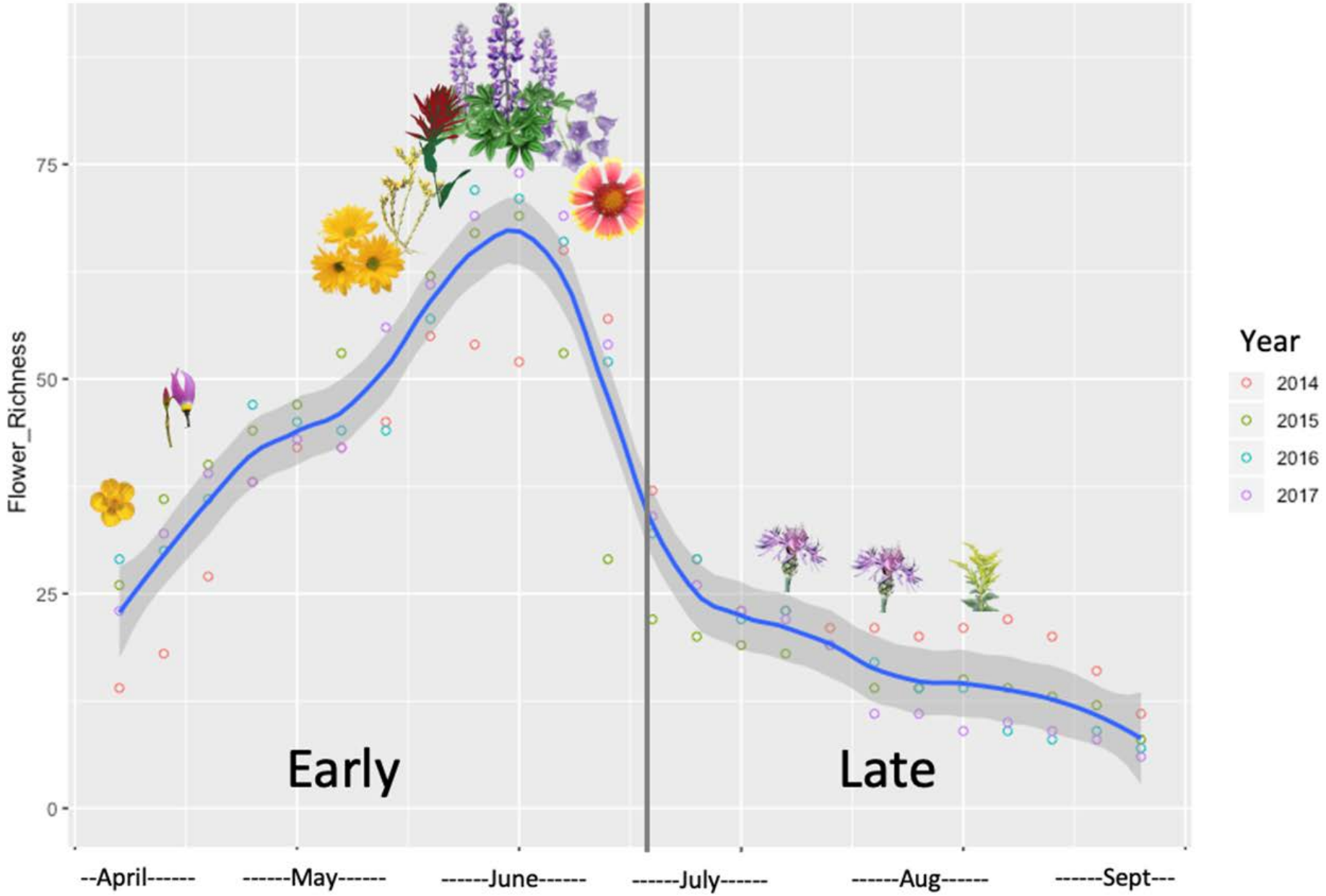






Urban landscapes can support a wide diversity of pollinators!

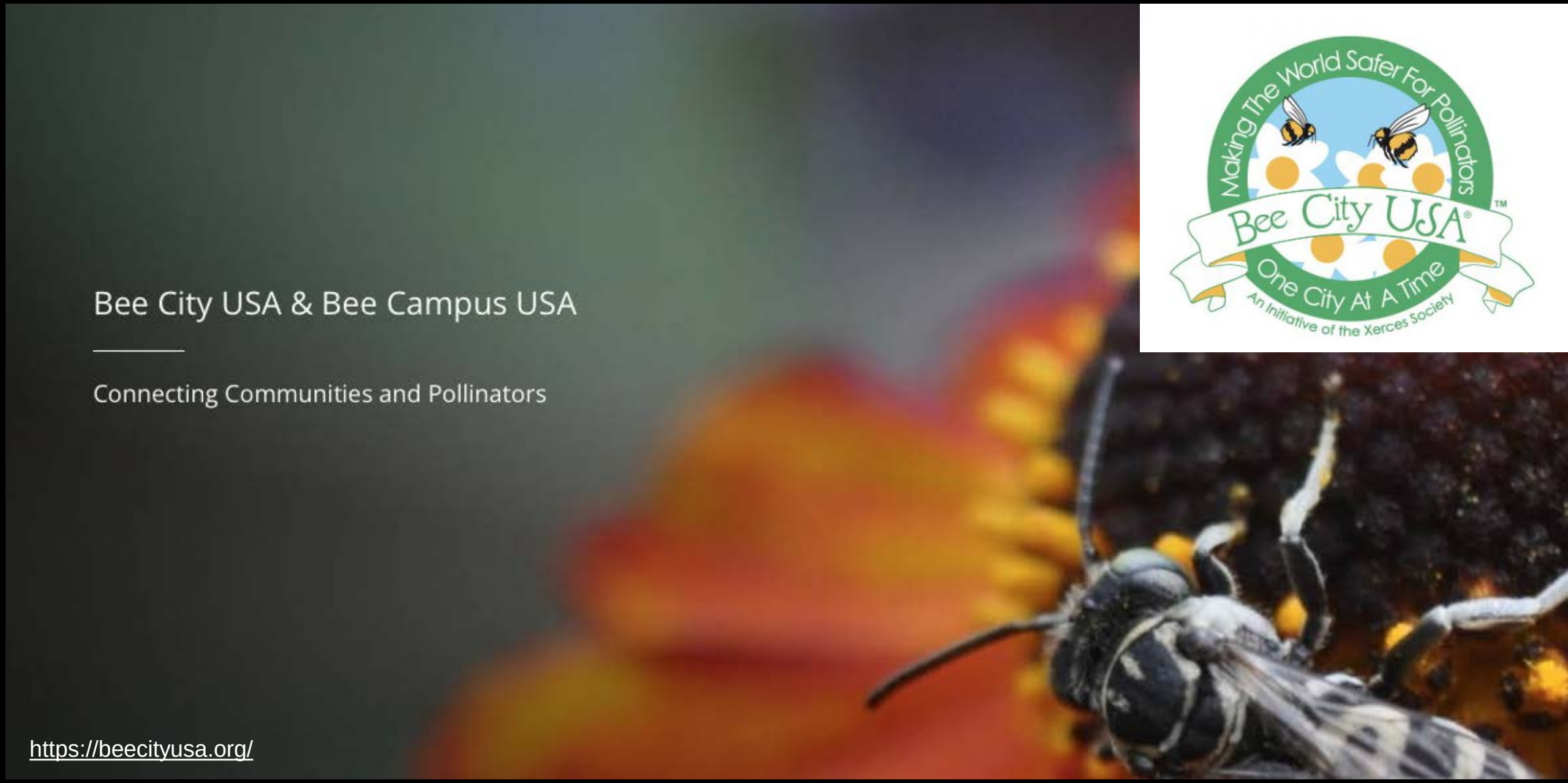
Flowering Richness at MPG Ranch, April - September




Bloom periods of native plants match
with flight periods of native bees

Bee City USA & Bee Campus USA

Connecting Communities and Pollinators



https://beecityusa.org/

LIVESTOCK

Western honeybee (*Apis mellifera*) NON-NATIVE DOMESTICATED ANIMAL

Environments where honeybees are necessary: large-scale agricultural areas

https://www.ceresimaging.net/blog/growers-protecting-bees-in-almond-orchards

Keeping honeybees to “help the pollinators” is like keeping chickens to “help the birds"

Resources for pollinator-friendly lawns and yards

Bee Lawns and alternative turfgrasses
- Missoula County Weed District “Flowering Lawn Project”
- University of Minnesota Extension “Flowering Bee Lawns”
- MT Native Plant Society “Water-wise grasses”

Info about native bees and other pollinators
- Xerces Society for Invertebrate Conservation
- Pollinator Partnership

Info about native plants for Montana landscaping
- Montana Native Plant Society website
- Xerces Society website
- Great Bear Native Plants, Mount Jumbo Nursery

Info about making bee hotels
- Xerces Society website

Questions?

MISSOULA COUNTY
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BBSL photos

70% of bee species nest in the ground

NATIVE BEES HAVE DIFFERENT NESTING REQUIREMENTS

90% of North American bee species are **solitary** nesters

Arizona Carpenter bee (*Xylocopa californica arizonensis*)

BBSL photo

Nesting – solitary, cavity-nesting

Solitary Bee Life Cycle

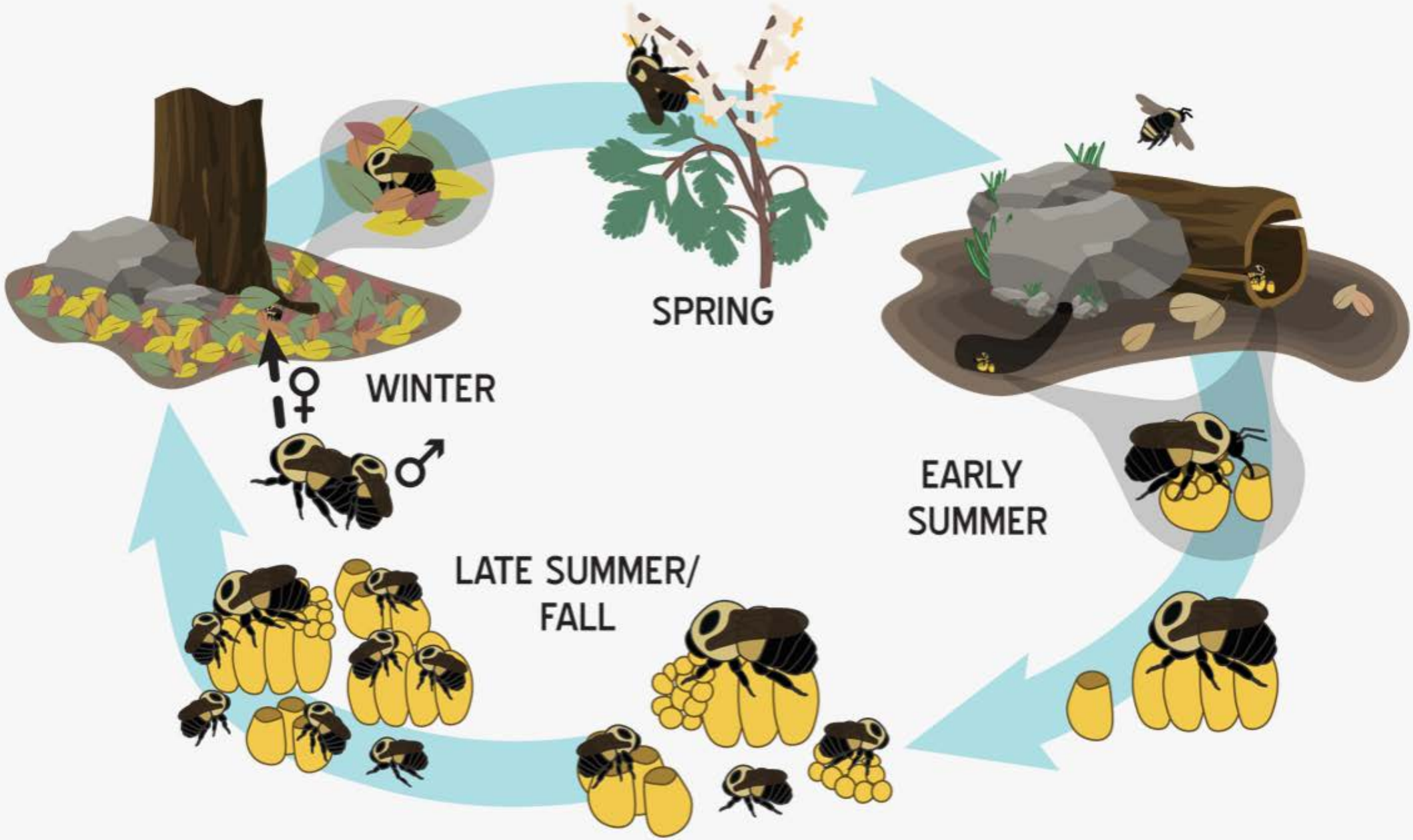
Female bee lays egg on pollen and nectar ball

Larva feeds on pollen and nectar ball

Larva develops into a pupa

The pupa emerges as an adult the next season

Bumble Bee Colony Life Cycle



https://www.reddit.com/r/Beekeeping/comments/8v0mi9/bumble_bee_nest_for_those_who_have_not_seen_a/

What about Dandelions?

Fine, but encourage other plants