Habitat management to promote native pollinators

Eugene Miliczky
USDA-ARS
Yakima Agricultural Research Laboratory
Wapato, Washington

Importance of native pollinators I

- Principal pollinators of many native plants
  - Successful reproduction in many native plants is dependent upon the activity of native pollinators
  - Native pollinators help maintain genetic diversity in many native plants through cross-pollination
  - Seeds, fruits, & new plants produced as a result of native pollinator activity benefits wildlife, humans etc; ex. poor fruit set in *Viburnum cassanoides* under low pollinator abundance in Maine

Importance of native pollinators II

- Pollination of plants/crops important to humans
  - Principal pollinators of crops poorly pollinated by honeybees. ex. Alfalfa grown for seed – alkali bee (native), alfalfa leafcutter bee (introduced)
  - Supplemental pollination of crops pollinated by honeybees. ex. tree fruits (contribution may be poorly understood, undervalued in some cases)
  - Pollination in special situations. ex. greenhouse pollination of tomatoes by bumblebees
  - Importance may increase if honeybee declines

Promoting native pollinators I: soil nesters

- Soil type: variable, but often quite sandy
- Site should be well drained – no standing water. Sandy soils encourage good drainage
- Ground slope: ~level (most species); vertical surfaces (some species)
- Vegetative cover: highly variable – bare ground to densely vegetated
- Long sun exposure: bees are ectotherms
- Undisturbed nesting sites: no till/mow

The Alkali bee: a "managed" ground-nesting bee

- The only ground-nesting bee managed on a commercial scale (alfalfa seed production)
- Native to the Pacific Northwest
- Nests in dense aggregations
- Nest site requirements are known and artificial nest sites have been produced
  - Soil size distribution: 75% sand, 17% silt, 8% clay
  - Soil moistened from subsurface water (13%)
  - Little or no surface vegetation

Promoting native pollinators II: above-ground nesters

- Many species utilize pre-existing tunnels of various sizes in woody substrates
- Many species nest in hollow or pithy stems such as elderberry, sumac, & tall buckwheat
- A few species utilize rotting wood
- A few can bore into intact wood or timber
- Special materials (mud, plant resin, leaves & petals to cut or chew) needed by many spp.
- We can provide many of the above to (hopefully) attract bees to an area or increase their numbers

The blue orchard mason bee: a managed above-ground nester

- Small scale management for tree fruit pollination: home gardens, small producers
- Native to PNW; available for purchase online and in some nurseries
- Will nest in dense aggregations
- Artificial nest materials: paper tubes or straws
- Requires mud for cell construction
- Superior to honeybee as an apple pollinator on a bee for bee basis

Promoting native pollinators III: requirements for all species

- Suitable habitat of sufficient size to sustain pollinator populations
- Sources of pollen & nectar must be present; oligoleges need specific pollen source(s)
- Minimize disturbance to nesting and foraging sites especially during active season
- Minimum or no exposure to pesticides
- Source of bees to colonize the site