**Which weeds are good for pollinators and should be left, even if invasive?**

As a general rule of thumb, if pollinators are observed foraging on it, it’s good for pollinators. Invasive plants like Himalayan blackberry (*Rubus ameniacus*) do provide important nectar and pollen resources, especially during “gaps” in the season (mid-May) when there are few flowering plants available. However, if Himalayan blackberry is the single most dominant species on the site, it can create a food “desert” after the bloom period. Pollinators may be stranded without foraging resources and/or spend energy searching for flowering plants. This is especially true if the native pollinators that have inhabited the site fly only a short distance from their nest. For example, the small carpenter bee (*Ceratina sp*.), only 0.1-0.6 inches long, creates a nest in the pithy center of dead stems/canes of plants including blackberry. So, while, Himalayan blackberry can provide important foraging (and nesting) resources for pollinators, it’s equally important to keep in mind that a diversity of flowering plants sustain many different types of bees (bumble bees, ground nesting bees, leaf cutter and carpenter bees) over the course of the entire season from early spring to fall. The small carpenter bee also uses the pith of native plants such as salmonberry (*Rubus spectabilis*) and elderberry (Sambucus racemose) that bloom in the spring as well as oceanspray (*Holodiscus discolor*) that blooms early summer.

**How do I introduce pollinators into an area dense with reed canary grass?**

Reed canary grass is a challenge! Understanding site-specific conditions and timing management actions to site variables is key for effective management. There are numerous publications you can find online that describe the biology, ecosystem impacts and management guidelines for dealing with reed canary grass. For example, the publication by Wisconsin Reed Canary Grass Management Working Group (2009), “Reed Canary Grass (*Phalaris arundinacea*) Management Guide: Recommendations for Landowners and Restoration Professionals,” includes information on the life cycle of reed canary grass, management implications and a table of management practices as wide ranging as burning, application of herbicide to mowing.

Generally, for pollinators, the primary goal is to replace reed canary grass with a diversity of native plant species while still maintaining a relatively open canopy. Intersperse clumps of emergent plants with native shrubs. Emergent wetland plants such as slough sedge (*Carex obnupta*), sitka sedge (*Carex aquatilis*) and soft rush (*Juncus effusus*) provide forage for skipper caterpillars. Shrubs like twinberry (*Lonicera involucrate*), Pacific ninebark (*Physocarpus capitatus*), Spiraea and nootka rose (*Rosa nutkana*) provide forage for native bees such as mason bees, bumblebees and polyester bees. In fact, polyester bees are closely associated with damp soils. They secrete a cellophane-like substance to line their nest, effectively making nests in the ground waterproof!

**How do I reintroduce butterflies such as the spring azure?**

The Echo Azure (*Celastrina echo*) is listed as a common butterfly in Western Washington but has been rarely documented. One of the more recent sightings of Echo Azure was in Magnuson Park, Seattle, in Apr. 2022 and suggests that the species could be present in urban parks that are similarly fragmented (i.e., Discovery Park). One of the interesting things about Echo Azure is that it has a complex life history which includes mutualist behavior with ants. It is unknown if the absence of ants limits the presence of butterflies. However, there are many host plants that have been recorded for Echo Azure including Pacific blackberry (*Rubus ursinus*), red osier dogwood (*Cornus sericea*), elderberry (*Sambucus racemosa*), oceanspray (*Holodiscus discolor*) and madrone (*Arbutus menziesii*). While looking for caterpillars is virtually impossible, keep your eyes peeled for butterflies in early spring. Adults only live for 2-3 days! While “reintroduction” of Echo Azure may not be possible without significant resources (time and money), chances are you may find a butterfly flitting about if you consistently look for them in open woodland areas.

**What are some great native plants for pollinators?**

There are so many native plants that support pollinators! The Native Pollinator Habitat Restoration Guide – Puget Sound Lowlands by Matthew B. Schwartz and Nelson Salisbury have several plant lists organized by flowering period (early, mid late) and site conditions (e.g., dry habitats). Of course, plant selection should depend on site conditions but some of my all-time favorites are:

* Evergreen huckleberry (*Vaccinium ovatum*)
* Tall Oregon grape (*Mahonia aquifolium*)
* Stinging nettle (*Urtica dioica*)
* Bitter cherry (*Prunus emarginata*)
* Salmonberry (*Rubus spectablis*)
* Oceanspray (*Holodiscus discolor*)
* Goldenrod (*Solidago sp*.)
* Pearly Everlasting (*Anaphalis margaritacea*)

**Do herbicides impact native pollinators?**

It’s variable and depends on many factors including type of herbicide, dosage, pollinator type and life stage of pollinator at time of exposure. For example, studies on Oregon silverspot butterfly (*Speyeria = Argynnis zerene hippolyta*) found that negative effects of herbicides, clopyralid and fluazifop-P-butyl, and adjuvants, Agri-Dex® and Nu-Film®-IR, are limited. However, there is research that glyphosate alters bacteria in the insects’ guts, making them vulnerable to infection (Science 2008) and high levels of mortality following contact exposure in bumble bees (Straw et. al. 2021). Of course, neonicotinoids, a group of systemic insecticides have been shown to be long lasting in soil and present in pollen and nectar. I tend to be conservative in my use of herbicides and use it only when other management tools are unavailable (or not possible).