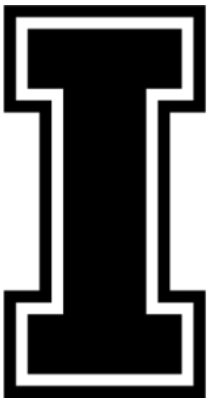
# Native Plants Guide



University of Idaho

Office of Sustainability

# Native Plants Guide

According to the Palouse Land Trust, the native Palouse Prairie is the most endangered ecosystem in the continental U.S, with less than 1% of the native habitat remaining. As a land-grant university, we are committed to preserving the natural beauty of the region through native landscaping and habitat restoration. Do your part to restore the native roots of the Palouse with this Native Gardening Guide.

## Native Trees

***Acer glabrum.*** Common name: Rocky Mountain Maple. Flowering time: Spring. Easy care.

***Acer sapindales.*** Common name: Boxelder Maple. Flowering time: Early spring.

***Alnus.*** Common name: Alder. Flowering time: Early spring. Not drought tolerant.

***Betula.*** Common name: Birch. Flowering time: Spring. Not drought tolerant.

***Pinus.*** Common name: Pine. Flowering time: Spring.

***Populus tremuloides.*** Common name: Quaking Aspen. Flowering time: Spring. Not drought tolerant.

***Populus trichocarpa.*** Common name: Black Cottonwood. Flowering time: Spring. Not drought tolerant.

***Rosales.*** Common name: Plum, Cherry. Flowering time: Late winter, early spring. Somewhat drought tolerant.

***Salix spp.*** Common name: Willow. Flowering time: Early spring, spring. Easy care. Not drought tolerant.

# Native Shrubs

***Amelanchier alnifolia.*** Common name: serviceberry, Saskatoon. Flowering time: spring. Easy care. Bloom color: White. Lighting: full to partial sun. Watering requirement: Medium. Mature Height: 6-15 ft. Value to wildlife: Good cover and food source.

***Arctostaphylos uva-ursi.*** Common name: bearberry, Kinnikinnik. Flowering time: spring/early summer. Easy care. Bloom color: white or pink. Lighting: Full sun to partial shade. Watering requirement: Low. Mature Height: 6-12 in. Ground cover.

***Berberis aquifolium.*** Common name: shiny Oregon grape. Flowering time: spring. Easy care. Bloom color: yellow. Lighting: Full to partial shade. Watering requirement: Low. Mature Height: 3-6 ft. Value to wildlife: Berries and cover. Tall growing.

***Berberis repens.*** Common name: creeping Oregon grape. Flowering time: spring. Easy care. Bloom color: yellow. Lighting: Full to partial shade. Watering requirement: Low. Mature Height: 1-3 ft. Value to wildlife: Berries and cover  Low growing.

***Ceanothus sanguineus.*** Common name: red-stem ceanothus. Flowering time: summer. Bloom color: White. Lighting: Full sun to partial shade. Watering requirement: Medium. Mature Height: 2-6 ft. Value to wildlife: Elk browse and berries for bird. Rhizomatous.

***Clematis ligusticifolia.*** Common name: western white clematis. Flowering time: summer. Bloom color: White. Lighting: Full sun to partial shade. Watering requirement: Medium. Mature Height: Climbs up to 20 ft. Woody vine.

***Cratageus douglasii.*** Common name: black hawthorn. Flowering time: spring/early summer. Bloom color: White. Lighting: Full sun to partial shade. Watering requirement: High. Mature Height: 12-30 ft. Value to wildlife: Food and cover. Rhizomatous.

***Dasiphora fruiticosa.*** Common name: shrubby cinquefoil. Flowering time: late spring-early summer. Bloom color: Yellow. Lighting: Full sun to partial shade. Watering requirement: Medium. Mature Height: 2-4 ft. Value to wildlife: Food and cover.

***Eriogonum heracleoides.*** Common name: parsnipflower buckwheat. Flowering time: spring/early summer. Easy care. Bloom color: White or pink. Lighting: Full sun. Watering requirement: Low. Mature Height: 4-16 in.

Eriogonum niveum. Common name: snow buckwheat. Flow-ering time: fall. Bloom color: White or pink. Lighting: full sun. Watering requirement: Low. Mature Height: 16-24 in.

***Eriogonum ovalifolium.*** Common name: cushion buckwheat. Flowering time: late spring/summer. Bloom color: White, red, yellow or purple. Lighting: Full sun. Watering requirement: Low. Mature Height: 1-1.5 ft.

***Eriogonum umbellatum.*** Common name: sulphur-flower buckwheat. Flowering time: late spring/summer. Bloom color: Yellow. Lighting: full sun. Watering requirement: Low. Mature Height: 0.5-2 ft. Value to wildlife: Cover, fall forage.

***Holodiscus discolor.*** Common name: ocean spray. Flowering time: summer. Easy care. Bloom color: Cream. Lighting: Full sun to partial shade. Watering requirement: Low. Mature Height: 3-9 ft. Value to wildlife: Browse and cover.

***Penstemon fruticosus.*** Common name: shrubby penstemon. Flowering time: late spring. Bloom color: purple. Lighting: Full sun. Watering requirement: Low to Medium. Mature Height: 6-15 in.

***Philadelphus lewisii.*** Common name: Lewis' mock orange. Flowering time: summer. Easy care. Bloom color: White. Lighting: full sun to partial shade. Watering requirement: Low. Mature Height: 4-8 ft. Value to wildlife: Food (berries).

***Physocarpus malvaceus.*** Common name: ninebark. Flowering time: late spring. Bloom color: White. Lighting: Partial shade. Watering requirement: Medium. Mature Height: 1.5-6 ft. Value to wildlife: Food and cover. Rhizomatous.

***Prunus virginiana.*** Common name: chokecherry. Flowering time: summer. Easy care. Bloom color: White. Lighting: Full sun to partial shade. Watering requirement: Medium. Mature Height: 10-20 ft. Value to wildlife: Excellent food and cover. Rhizomatous.

***Purshia tridentata.*** Common name: Antelope bitterbrush. Flowering time: Late spring-early summer. Bloom color: Yellow. Lighting: Full sun. Watering requirement: Low. Mature Height: 2-6 ft. Value to wildlife: Cover and fall forage.

***Ribes aureum.*** Common name: golden currant. Flowering time: spring. Easy care. Bloom color: Yellow. Lighting: Full sun to partial shade. Watering requirement: Medium. Mature Height: 4-6 ft. Value to wildlife: Nesting, cover and fruit. Vigorous.

***Ribes cereum.*** Common name: wax currant. Flowering time: spring. Bloom color: White, greenish-white, or pink. Lighting: Full sun to partial shade. Watering requirement: Low. Mature Height: 3-4 ft. Value to wildlife: Berries and cover.

***Rosa nutkana.*** Common name: Nootka rose. Flowering time: summer. Bloom color: Pink. Lighting: Full to partial sun. Watering requirement: Low. Mature Height: 3-6 ft. Value to wildlife: Nesting, cover and excellent food. Rhizomatous.

***Rosa woodsii.*** Common name: Woods' rose. Flowering time: summer. Bloom color: Pink. Lighting: Full sun to partial shade. Watering requirement: Medium. Mature Height: 3-6 ft. Value to wildlife: Nesting, cover and excellent food. Rhizomatous.

***Salix spp.*** Common name: willows. Flowering time: spring. Bloom color: Yellow. Lighting: Full sun to partial shade. Watering requirement: Medium. Mature Height: 15-30 ft. Rhizomatous.

***Sambucus nigra ssp.*** Cerulea. Common name: blue elderberry. Flowering time: early-mid summer. Bloom color: White to cream. Lighting: Full sun to partial shade. Watering requirement: Medium. Mature Height: 6-15 ft. Value to wildlife: Nesting and food.

***Spiraea douglasii.*** Common name: Douglas' spiraea. Flowering time: summer. Bloom color: Pink. Lighting: Full sun to partial shade. Watering requirement: Medium to high. Mature Height: 3-6 ft. Value to wildlife: Browse. Rhizomatous.

***Symphoricarpos albus.*** Common name: snowberry. Flowering time: summer. Easy care. Bloom color: White or Pink. Lighting: Full sun to partial shade. Watering requirement: Medium. Mature Height: 2-4 ft. Value to wildlife: food, berries, browse and cover. Rhizomatous.

# Native Herbaceous

***Achillea millifolium.*** Common name: western yarrow. Flowering time: June-July. Easy care. Bloom color: White to yellow. Lighting: Full sun. Watering requirements: Low. Mature height: 0.5-1.5 ft. Insect support: medium, specialist (beetle: *Cleridae*). Value to wildlife: Forage. Rhizomatous.

***Agastache urticifolia.*** Common name: nettleleaf giant hysop. Flowering time: July-August. Bloom color: White, pink or purple. Lighting: Full to partial sun. Watering requirements: Low to Medium. Mature height: 0.3-5 ft. Insect support: medium, specialist (bee: *Bombus*).

***Ambrosia.*** Common name: ragweed. Flowering time: July-August. Bloom color: Yellow. Lighting: partial sun. Watering requirements: Low. Mature height: 1-4 ft. Insect support: medium.

***Asclepias speciosa.*** Common name: showy milkweed. Flowering time: June-July. Easy care. Bloom color: Pink, green or purple. Lighting: full sun. Watering requirements: Medium. Mature height: 1.5-5 ft. Rhizomatous; larval host for monarch.

***Astragalus canadenis.*** Common name: Canada milvetch. Flowering time: June-July. Bloom color: Cream to white. Lighting: full sun to partial shade. Watering requirements: Medium. Mature height: 1-2.5 ft. Value to wildlife: Forage and seed food source. Host larvae (butterfly: *Pieridae*).

***Balsamorhiza sagittata.*** Common name: arrowleaf balsamroot. Flowering time: mid April-May. Bloom color: Yellow. Lighting: full sun Watering requirements: Medium. Mature height: 1-2 ft. Insect support: high. Value to wildlife: Fair forage.

***Camassia quamash.*** Common name: camas. Flowering time: mid April-May. Bloom color: Blue to purple. Lighting: full sun to partial shade. Watering requirements: High. Mature height: 1-3 ft. Insect support: medium, specialist (bee: *Osmia*).

***Campanula rotundifolia.*** Common name: harebells. Flowering time: June-July. Bloom color: Blue or purple. Lighting: full sun to shade. Watering requirements: Low. Mature height: 6-15 in.

***Chamaenerion angustifolium.*** Common name: fireweed. Flowering time: June-July. Easy care. Bloom color: Pink. Light-ing: full sun. Watering requirements: Low to Medium. Mature height: 2-4 ft. Value to wildlife: Fair to good forage. Rhizoma-tous.

***Cirsium brevifolium.*** Common name: Palouse thistle. Flower-ing time: July-August. Bloom color: White or purple. Lighting: full sun. Watering requirements: Low. Mature height: 2-4 ft. Insect support: medium.

***Delphinium nuttallinum.*** Common name: larkspur. Flowering time: mid April-May. Bloom color: Light blue to purple. Light-ing: full sun to partial shade. Watering requirements: Low. Mature height: 12-30 in. Insect support: low, specialist (bee: *Bombus*).

***Drymocallis arguta.*** Common name: tall cinquefoil. Flowering time: June-July. Bloom color: Pale yellow to white. Lighting: full sun. Watering requirements: Medium. Mature height: 1.5-3 ft. Value to wildlife: Fair to good forage.

***Erigeron filifolius.*** Common name: threadleaf fleabane. Flowering time: June-August. Bloom color: Blue, pink, yellow or white. Lighting: Full sun. Watering requirements: Low. Mature height: 4-20 in.

***Erigeron pumilus.*** Common name: shaggy daisy. Flowering time: May-June. Bloom color: White, blue or pink. Lighting: full sun to partial shade. Watering requirements: Low. Mature height: 2-20 in.

***Erigeron speciosus.*** Common name: showy daisy. Flowering time: June-August. Bloom color: Purple, white. Lighting: full sun to partial shade. Watering requirements: Low to Medium. Mature height: 6-32 in.

***Eriophyllum lanatum.*** Common name: Oregon sunshine. Flowering time: summer (June-July). Bloom color: Yellow. Lighting: full sun to partial shade. Watering requirements: Low. Mature height: 4-24 in. Value to wildlife: Food and cover.

***Erythronium grandiflorum.*** Common name: glacier lily. Flowering time: mid March-mid April. Bloom color: yellow. Lighting: full to partial sun. Watering requirements: Medium. Mature height: 4-7 in. Insect support: low.

***Fritillaria pudica.*** Common name: yellow bell. Flowering time: mid March-mid April. Bloom color: Yellow. Lighting: full to partial sun. Watering requirements: Medium. Mature height: 4-12 in.

***Gaillardia aristata.*** Common name: blanketflower. Flowering time: June-July. Bloom color: Orange, yellow. Lighting: full sun. Watering requirements: Medium. Mature height: 1-1.5 ft. Insect support: medium. Value to wildlife: Excellent food and cover.

***Gentiana affinis.*** Common name: gentian. Flowering time: August. Bloom color: Blue or purple. Lighting: full sun. Watering requirements: Medium. Mature height: 8-16 in. Insect support: medium, specialist (bee: *Osmia*).

***Geranium viscosissimum.*** Common name: sticky geranium. Flowering time: June-July. Easy care. Bloom color: Pink, purple. Lighting: full sun or partial shade. Watering requirements: Low to Medium. Mature height: 2-3 ft. Insect support: high, specialist (bee: *Eucera, Agapostemon*). Value to wildlife: Good forgage.

***Geum triflorum.*** Common name: prairie smoke. Flowering time: spring (mid April-May). Bloom color: Yellow. Lighting: full sun. Watering requirements: Medium. Mature height: 1 ft.

***Helianthella uniflora.*** Common name: little sunflower. Flowering time: April-May. Bloom color: yellow. Lighting: full to partial sun. Watering requirements: Low to Medium. Mature height: 1-3 ft. Insect support: medium. Value to wildlife: Good grazing.

***Hieracium scouleri.*** Common name: western hawkweed. Flowering time: July-August. Bloom color: yellow to orange. Lighting: full sun to partial shade. Watering requirements: Low to Medium. Mature height: 1-2.5 ft. Insect support: high.

***Hydrophyllum capitatum.*** Common name: ballhead waterleaf. Flowering time: mid April-May. Bloom color: Purple. Lighting: Full to partial shade. Watering requirements: Medium. Mature height: 1 ft. Insect support: low, specialist (beetle: *Melyridae*). Dies back.

***Iliamana rivularis.*** Common name: streambank hollyhock. Flowering time: summer (June-July). Bloom color: red, pink, purple. Lighting: Partial shade. Watering requirements: High. Mature height: 1.5-6 ft.

***Linum lewisii.*** Common name: Lewis flax. Flowering time: summer (June-July). Easy care. Bloom color: Light blue. Lighting: full sun. Watering requirements: Low to Medium. Mature height: 1-2 ft. Value to wildlife: Excellent food source.

***Lithophragma spp.*** Common name: prairie star. Flowering time: mid April-May. Bloom color: white or pink. Lighting: full sun. Watering requirements: Low. Mature height: 12-20 in. Insect support: medium, specialist (moth: *Greya*).

***Lomatium spp.*** Common name: biscuitroots mid. Flowering time: March-mid April. Bloom color: Yellow green. Lighting: full sun. Watering requirements: Low. Mature height: 0.5-3 ft. Insect support: low. Value to wildlife: Good forage.

***Lupinus polyphyllus.*** Common name: large-leaved lupine. Flowering time: June-July. Bloom color: Blue to purple. Lighting: full sun. Watering requirements: Medium to High. Mature height: 20-40 in. Insect support: low, specialist (bee: Bombus).

***Lupinus sericeus.*** Common name: silky lupine. Flowering time: June-July. Bloom color: Blue to purple. Lighting: full sun. Watering requirements: Low. Mature height: 12-24 in. Insect support: low, specialist (bee: Bombus).

***Mertensia longiflora.*** Common name: long-flowered bluebell. Flowering time: mid March-mid April. Bloom color: blue-purple, pinkish-white. Lighting: partial shade. Watering requirements: Medium-High. Mature height: 1-1.5 ft.

***Monarda fistulosa.*** Common name: beebalm; wild bergamot. Flowering time: June-July. Bloom color: purple, pink, white. Lighting: partial sun. Watering requirements: Medium. Mature height: 2-5 ft.

***Olsynium douglasii.*** Common name: grass widows. Flowering time: mid March-mid April. Bloom color: white, pink, purple. Lighting: partial sun. Watering requirements: Medium. Mature height: 8-10 in. Insect support: high, specialist (bee: *Habropoda*).

***Penstemon attenuatus.*** Common name: taper leaved penstemon. Flowering time: May-July. Bloom color: Blue, purple, pink or yellow. Lighting: full sun to partial shade. Watering requirements: Low. Mature height: 4-30 in. Value to wildlife: Fair to good forage.

***Penstemon confetus.*** Common name: Yellow penstemon. Flowering time: June-July. Bloom color: Pale yellow. Lighting: full sun to partial shade. Watering requirements: Medium. Mature height: 8-20 in. Value to wildlife: Fair to good forage.

***Penstemon deustus.*** Common name: hotrock penstemon. Flowering time: June-July. Bloom color: White to pale purple. Lighting: full sun to partial shade. Watering requirements: Medium. Mature height: 0.75-2 ft. Value to wildlife: Fair to good forage.

***Penstemon spp.*** Common name: beardtongues. Flowering time: May-August. Bloom color: blue-purple, pale yellow. Lighting: full sun to partial shade. Watering requirements: Medium. Mature height: 3-5 ft.

***Perideridia gairdneri.*** Common name: yampah. Flowering time: August. Bloom color: White. Lighting: Shade. Watering requirements: High. Mature height: 1.5-4.5 ft. Insect support: high.

***Phacelia spp.*** Common name: phacelia, scorpionweed. Flowering time: summer (June-July). Bloom color: pale purple, blue-purple. Lighting: Full sun. Watering requirements: Low. Mature height: 0.5-3 ft. Seeds in.

***Phlox spp.*** Common name: phlox. Flowering time: late spring (April-June). Bloom color: pink, white. Lighting: full sun to partial shade. Watering requirements: Low-Medium. Mature height: 0.5-1.5 ft.

***Potentilla gracilis.*** Common name: slender cinquefoil. Flowering time: June-July. Easy care. Bloom color: yellow. Lighting: full sun to partial shade. Watering requirements: Low. Mature height: 2-4 ft. Insect support: high (highest seen: bee candy).

***Prunella vulgaris.*** Common name: selfheal. Flowering time: summer (June-July). Bloom color: white, purple. Lighting: Full sun to partial shade. Watering requirements: Medium. Mature height: 1-1.3 ft. Hosts clouded sulphur butterfly.

***Pyrrocoma liatriformis.*** Common name: Palouse goldenweed. Flowering time: August. Bloom color: Yellow. Lighting: partial sun. Watering requirements: Medium. Mature height: 1.5 ft. Insect support: medium. Extremely rare in the wild.

***Ranunculus glaberrimus.*** Common name: sagebrush buttercup. Flowering time: mid March-mid April. Bloom color: yellow. Lighting: full sun. Watering requirements: High. Mature height: 3-4 in.

***Sedum spp.*** Common name: stonecrops. Flowering time: summer/fall (June-August). Bloom color: red, pink, yellow, white. Lighting: full sun. Watering requirements: Low. Mature height: 2-30 in.

***Senecio integerrimus.*** Common name: western groundsel. Flowering time: mid April-May. Bloom color: yellow, white. Lighting: full sun to partial shade. Watering requirements: Low to Medium. Mature height: 1-2 ft. Insect support: low.

***Sidalcea organa.*** Common name: oregon-checker mallow. Flowering time: July-August. Bloom color: white, pink. Lighting: full sun to partial shade. Watering requirements: Medium-High. Mature height: 2-4 ft. Insect support: low, specialist (bee: Diadasia nigrifrons).

***Solidago lepida.*** Common name: Canada goldenrod. Flowering time: August-October. Easy care. Bloom color: Yellow. Lighting: full sun to partial shade. Watering requirements: Medium. Mature height: 3-5 ft. Value to wildlife: Fair forage and seed food source for song birds. Rhizomatous.

***Solidago missouriensis.*** Common name: Missouri goldenrod. Flowering time: August-October. Easy care. Bloom color: Yellow. Lighting: Full sun. Watering requirements: Low. Mature height: 0.75-3 ft. Insect support: medium. Value to wildlife: Fair forage and seed food source for song birds. Rhizomatous.

***Symphyotrichum jessicae.*** Common name: Jessica's aster. Flowering time: fall (late July-september). Easy care. Bloom color: yellow, purple. Lighting: full sun. Watering requirements: Low-Medium. Mature height: 1-5 ft. Rhizomatous.

***Symphyotrichum spathulatum.*** Common name: western aster. Flowering time: fall (July-August). Easy care. Bloom color: Purple. Lighting: full sun. Watering requirements: Low-Medium. Mature height: 0.5-3 ft. Value to wildlife: Excellent food and cover.

***Toxicoscordion venenosum.*** Common name: death camas. Flowering time: June-July. Bloom color: cream to yellow. Lighting: full sun to partial shade. Watering requirements: Medium. Mature height: 2-3 ft. Insect support: very specialist (bee: Andrena astralagi, specialist syrphids). All parts of this plant are poisonous if ingested.

***Viola spp.*** Common name: violets. Flowering time: spring (April-June). Bloom color: blue purple. Lighting: full to partial sun. Watering requirements: Medium. Mature height: 2-8 in.

***Wyethia amplexicaulis.*** Common name: mule's ear. Flowering time: June-July. Bloom color: yellow. Lighting: full sun. Watering requirements: medium. Mature height: 2-3 ft. Insect support: low, specialist (bee: *Bombus*).

Native Plant Nurseries:

1. Cedar Mountain Perennials
2. Desert Jewels Nursery
3. Draggin' Wing High Desert Nursery
4. Fancy Fronds
5. Fiddler's Ridge Nursery
6. Franklin H. Pitkin Research Nursery
7. Palouse Clearwater Environmental Institute
8. Plant Natives Nursery
9. Plants of the Wild
10. Pleasant Hill Farm
11. Rose Creek Seed
12. Twin Peaks Nursery (Buffaloberry Farm)
13. Wildlife Habitat Nursery

University of Idaho

# LANDSCAPE INTEGRATED PEST & POLLINATOR MANAGEMENT PLAN

DECEMBER 2023

## Contents



# Definitions

**Bee Campus USA** – An online certification program that provides a framework for university and college campus communities to work together to conserve native pollinators by increasing the abundance of native plants, providing nest sites, and reducing the use of pesticides.

**Integrated Pest Management** – An Integrated Pest Management Program (IPM) is an ecosystem-based management strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as mechanical control, biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only on targeted species as a "last resort" and as minimally as possible to reach the desired goal. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

**Landscape IPPM Administrator** – The Landscape IPPM administrator will be appointed by the U of I Bee Campus Committee and may be considered the "working arm" of the committee. This individual will have multiple responsibilities related to the implementation of this plan.

**Pest** – Pests are organisms that damage or interfere with desirable plants in our fields and orchards, landscapes, or wildlands, or damage homes or other structures. Pests also include organisms that impact human or animal health. Pests may transmit disease or may be just a nuisance. A pest can be a plant (weed), vertebrate (bird, rodent, or other mammal), invertebrate (insect, tick, mite, or snail), nematode, pathogen (bacteria, virus, or fungus) that causes disease, or other unwanted organism that may harm water quality, animal life, or other parts of the ecosystem.

**Pesticide** – Any substance, or mixture of substances, used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may be detrimental to vegetation, humans, or animals.

**Pollinator** - An insect or other agent that conveys pollen to a plant and so allows fertilization.

# Introduction

The University of Idaho is committed to bettering the campus landscape for local, native pollinator health. We recognize that historically pest control actions have had significant adverse effects on pollinator populations. As a Bee Campus USA certified organization, we have chosen to expressly integrate pollinator management into our Integrated Pest Management Plan, hence the document title of Integrated Pest & Pollinator Management Plan (IPPM). Throughout this document the acronym IPPM will be used when referring to this document, and the acronym IPM will be used when referring to the IPM process. Additionally, hyperlinks are utilized throughout this document to link to relevant resources in lieu of including appendices. For the time

being, this document is only intended to govern actions relating to landscape management on the main University of Idaho campus in Moscow, Idaho.

## Goals

The goals of the IPPM program at U of I are to:

1. Protect human and environmental health by employing a range of preventative strategies and using least-toxic products and methods for pest control and eradication.
2. Inspect and monitor pest populations and locations to enhance control strategies.
3. Protect and enhance pollinator populations on campus using integrated pest management practices including the selection and applications of pesticides that are the least toxic to pollinators.

# Process

IPM involves integrating multiple pest control methods based on characteristics of the pest and site. While each situation is different, six major components are common to all IPM programs:

1. **Prevention** – With IPM, the best offense is a good defense. Actions are taken to keep pests from becoming a problem, such as:

    a. Maintaining a healthy landscape that can withstand pest attacks.
    b. Using disease and insect-resistant plants and certified weed-free seed sources.
    c. Using native plants that are adapted to localized environmental conditions such as those found in the University's Native Plants Guide.
    d. Removing conditions that attract pests, such as food, water, and shelter.
    e. Using appropriate irrigation and fertilization practices.
    f. Maintaining mowing, mulching, and pruning best practices.

2. **Pest Identification** – Correctly identifying the pest is key to knowing whether a pest is likely to become a problem and determining the best management strategy. Accurate identification is necessary to make the appropriate decisions. Mobile applications such as Seek, Picture This, and Picture Insect can be used for general plant and insect identification, and are especially useful when cross referenced against the host plant. If, after utilizing apps and online resources, the identity of a pest is still unclear, The University of Idaho Extension office has a list of Contacts by Specialty that can be reached out to through the Integrated Pest Management Center.

3. **Monitoring and Assessing Pest Numbers and Damage** Routinely check the campus landscape, or other sites to identify what pests and beneficial organisms are present, numbers of each and how extensive the pest damage is.

4. **Acceptable Pest Levels** – Different areas on campus will have different action thresholds based on the functional use classification of the affected area and the pest in question. For example, places of pride such as the Administration Lawn and/or places utilized for sports practice such as Guy Wicks' Field will have different action thresholds for dandelions and thistles than more naturalized and/or less utilized

areas such as the Water Tower Hill. Similarly, pests that pose a danger to human health and safety and/or species recognized by the state as noxious weeds will be more likely to warrant the use of pesticides. Action thresholds will be determined on a case by case basis as the site is assessed.

If action must be taken after site assessment, the emphasis will be on management not eradication. This IPPM plan contends that managing pest populations is a more sustainable approach to pest management.

For any instance where it is determined that action must be taken and the potential treatments may pose a threat to beneficial pollinator populations on campus such as the application of neonicotinoids (see section addressing neonicotinoid use below), the action must first be approved by the U of I Bee Campus Committee prior to implementation.

5. **Control** – Approaches for managing pests are often grouped in the following categories:

    a. **Cultural Control**: Cultural controls are practices that reduce pest establishment, reproduction, dispersal, and survival. For example, changing irrigation practices can reduce pest problems, since too much water can increase root disease and weeds.

    b. **Biological Control**: Biological control is the use of natural enemies — predators, parasites, pathogens, and competitors to control pests and their damage. Invertebrates, plant pathogens, nematodes, weeds, and vertebrates have many natural enemies.

    c. **Mechanical and Physical Control**: Mechanical and physical controls kill a pest directly, block pests out, or make the environment unsuitable. Physical controls include mulches for weed management, steam sterilization of the soil for disease management, cold treatments or barriers such as screens to keep birds or insects out, and weeding by hand.

    d. **Chemical Control**: Chemical control is the use of pesticides. Pesticides should be used judiciously, always following the pesticide label. Many times, pesticides are most effective when used in combination with other approaches for more effective, long-term control. In each case, managers should use the best available science to select the least-toxic pesticide appropriate for use in the situation and best management practices should be utilized during application. University of Idaho employees who apply pesticides should have the appropriate professional pesticide applicator licensing credentials.

        It is critical to take uninterrupted and undisturbed time to thoroughly read pesticide labels. Pollinator protection statements on the label should assist in pesticide selection and application timing decisions. Most bee poisoning incidents occur when:

        1. Highly toxic (to bees) insecticides are applied
        2. The extended residual toxicity of the product is longer than 8 hours
        3. Insecticides are applied to bee-pollinated plants during bloom

        Resources available to help avoid pesticides that are particularly toxic to bees, as well as to help select least toxic pesticides, include the Pesticide Toxicity to Bees "Traffic Light" and the UC IPM Bee Precaution Pesticide Ratings webpage. Information on residual toxicity times can be found on the EPAs Residual Time to 25% Bee Mortality (RT25) Data webpage.

SPECIAL STATEMENT REGARDING THE USE OF NEONICOTINOIDS:

Neonicotinoids are a group of insecticides that are chemically related to nicotine including acetamiprid, clothianidin, dinotefuran, imidacloprid, and thiamethoxam. Neonicotinoids are widely used on a variety of crops, turf, ornamentals, and pets (for flea treatment). While neonicotinoids are highly effective, it has been shown that these insecticides, when used inappropriately can adversely affect pollinators.

All neonicotinoid use on campus must first be approved by the U of I Bee Campus Committee, who will work together to determine the appropriate action threshold for the situation at hand and consider factors such as whether or not pollinators will be present during the residual toxicity period.

6. **Assessment of the Pest Management Plan** –A fundamental practice of IPM is a strong commitment to the continued evaluation of the plan. Focuses include proper training, up to date applicator licensing and continued educational opportunities. All pest control activity, including inspections, will be recorded in the IPM Tracking Form. The overall responsible party will record each pest in the IPM Tracking Form. The Spray Technician will record the applicable items from each site visit in the IPM Tracking Form. All pesticide applications will be recorded, as required by state law. On an annual basis, performance will be evaluated against the goals specified above by the Landscape IPPM Administrator and presented to the Bee Campus Committee. This is a living document - if the goals are not being met, adjustments will be made to this plan in order to facilitate goal achievement.

# Education

The University of Idaho, as a land-grant university, recognizes the value of making decisions and taking action based on the best currently available science. As such, U of I is committed to providing educational opportunities to stakeholders associated with this IPPM plan. The Landscape IPPM Administrator and all employees who will be applying pesticides on the campus landscape shall be required to hold a professional pesticide applicators license issued by the Idaho State Department of Agriculture.

Additionally, areas that are experiencing less pesticide use and/or areas that have been improved for pollinator habitat may be less conventionally attractive at certain times of year when viewed through a purely landscaping lens. U of I will provide learning opportunities and interpretive signage to help educate students, staff, faculty, and the public about the reason for these changes to the landscape.

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