



Rare Plants and Climate Change

The influence of climate change, especially warmer temperatures and less available moisture, is evident in the seasonal timing of flowering, range shifts northward or up in elevation, and changes in plant density or size at some sites. Many plant species have used these kinds of adaptations to survive climate change throughout their evolution. However, habitat fragmentation, competition from invasive plants, and consumption and trampling by livestock and native ungulates may make it difficult for rare species to adapt quickly enough to climate change. While fire suppression has contributed to the decline of native species vulnerable to encroachment by woody plants or requiring bare soil to become established, increasing fires can further the spread of non-native plants that compete for water, nutrients, and light. The rareness and cultural significance of several plants in the Upper Columbia Basin Network, described below, are of particular interest to park managers and may be vulnerable to the effects of accelerated climate change.

Spalding's Silene

Silene spaldingii is a small perennial related to the carnation and endemic to grasslands of the interior Northwest, most of which have been developed for agricultural use. Of the 99 known remaining occurrences of this flowering plant, Oregon's Lake Wallowa population is one of only 10 that have more than 500 plants. It is located on private land except for the five-acre Old Chief Joseph's Gravesite, part of Nez Perce National Historical Park. The U.S. Fish and Wildlife Service designated *S. spaldingii* a threatened species under the Endangered Species Act in 2007 because its remnant populations are at risk of further decline.

Yellowhair Indian Paintbrush

Castilleja xanthotricha is a perennial forb found only in the John Day and Trout River watersheds of Oregon, where it has been reported in seven locations. A 2007 survey of the Painted Hills unit of John Day Fossil Beds National Monument documented an average of 15 yellowhair Indian paintbrush at each of 307 sites on sagebrush slopes. This abundant population, most of which grows in the higher areas of the Painted Hills dominated by native species, is considered secure at present.



The camas lily produces a bulb high in protein and nutrients.



Yellowhair Indian paintbrush and Lemhi penstemon

Hidden Phacelia

Phacelia inconspicua is an herbaceous annual that has been found in small, isolated populations on volcanic and limestone substrate in southern Idaho and northern Nevada, especially where snow banks persist until late in the year. The species is difficult to monitor because its populations fluctuate widely from year to year in response to climatic and habitat conditions. "Hidden phacelia" was documented at several sites in Craters of the Moon National Monument and Preserve in 1993; although extensive surveys in 2001 could not find any specimens, it was reported in a vegetation mapping project completed in 2007.

Lemhi Penstemon

Penstemon lemhiensis is a large showy blue "beardtongue" of eastern Idaho and southwestern Montana. Recent UCBN surveys have confirmed that the largest reported population is at Big Hole National Battlefield, where it is concentrated on steep slopes and along an old road cut where slope movements maintain the open sites the species requires. Grass and shrub canopy closure may be the biggest threat to the species there. Flowering is most abundant when spring and early summer are cool and wet; hot, dry summers cause high mortality. The seeds can remain viable for at least six years, enabling germination in years with suitable conditions.

Camas

Camassia quamash is culturally significant as a food source for tribes of the Pacific Northwest. Although not a rare species *per se*, many of the wet prairies where it grows have been lost to agricultural use. Camas populations are below historical levels at Weippe Prairie in Nez Perce National Historical Park and along the river in Big Hole National Battlefield, and wetland restoration plans are designed to help them recover. Each spring student volunteers assist park staff by walking through dense wetland vegetation at sampling sites to count camas plants and check for the presence of invasive species. Positive trends in camas density have been detected at Weippe Prairie, a possible sign that initial restoration efforts are working.



Hidden phacelia (CRMO)

R.K. MOSELEY, ID CONSERVATION DATA CENTER



Snowball pediocactus (CIRO, JODA)

BLM PHOTO



Giant helleborine (HAFO)

BLM PHOTO



Spalding's silene (NEPE)

BLM PHOTO

Rare Plant Species in the Upper Columbia Basin Network

Listed below are the scientific and common names for species documented in Big Hole National Battlefield (BIHO), City of Rocks National Reserve (CIRO), Craters of the Moon National Monument and Preserve (CRMO), Hagerman Fossil Beds National Monument (HAFO), John Day Fossil Beds National Monument (JODA), Lake Roosevelt National Recreation Area (LARO), or Nez Perce National Historical Park (NEPE). The relative scarcity of these 45 species is evident in that only one—*Pediocactus simpsonii*—occurs in more than one park.

BIHO	<i>Camissonia subacaulis</i> <i>Eriogonum umbellatum</i> <i>Orobanche corymbosa</i> <i>Penstemon lemhiensis</i>	longleaf suncup, northern evening primrose buckwheat clustered broomrape Lemhi penstemon
CIRO	<i>Cymopterus davisii</i> <i>Pediocactus simpsonii</i> <i>Polystichum kruckebergii</i>	Davis springparsley snowball pediocactus, Simpson's hedgehog cactus Kruckeberg's hollyfern
CRMO	<i>Astragalus oniciformis</i> <i>Downingia bacigalupii</i> <i>Phacelia inconspicua</i>	Picabo milkvetch Bacigalupi downingia, Bach's calicoflower hidden phacelia, obscure phacelia
HAFO	<i>Astragalus purshii</i> var. <i>ophiogenes</i> <i>Cymopterus acaulis</i> var. <i>greeleyorum</i> <i>Epipactis gigantea</i> <i>Eriogonum shockleyi</i> var. <i>shockleyi</i>	Snake River milkvetch Greeley spring parsley giant helleborine, giant hellebore, stream orchid Shockley's buckwheat, Shockley buckwheat
JODA	<i>Achnatherum hendersonii</i> <i>Allium pleianthum</i> <i>Asclepias cryptoceras</i> <i>Astragalus diaphanus</i> <i>Astragalus misellus</i> var. <i>misellus</i> <i>Castilleja xanthotricha</i> <i>Chaenactis nevii</i> <i>Juncus torreyi</i> <i>Lomatium hendersonii</i> <i>Pediocactus simpsonii</i> <i>Penstemon eriantherus</i> <i>Silene scaposa</i>	Henderson's needlegrass, Henderson ricegrass manyflower onion Humboldt milkweed, mountain milkweed transparent milkvetch pauper milkvetch yellowhair Indian paintbrush John Day's pincushion Torrey's rush, torrey rush Henderson's desert parsley snowball pediocactus, Simpson's hedgehog cactus fuzzytongue penstemon, crested tongue penstemon scapose catchfly
LARO	<i>Gilia leptomeria</i> <i>Lobelia kalmii</i> <i>Mimulus washingtonensis</i> <i>Nicotiana attenuata</i> <i>Salix candida</i>	sand gily-flower, sand gilia, slender gilia Ontario lobelia, brook lobelia Washington monkeyflower coyote tobacco, coyote tabacco sage willow, sageleaf willow
NEPE	<i>Astragalus gilviflorus</i> <i>Calochortus macrocarpus</i> var. <i>maculosus</i> <i>Cheilanthes feei</i> <i>Coryphantha vivipara</i> <i>Juncus acuminatus</i> <i>Penstemon globosus</i> <i>Phlox idahonis</i> <i>Polygonum polygaloides</i> ssp. <i>confertiflorum</i> <i>Ranunculus orthorhynchus</i> <i>Ribes velutinum</i> <i>Rubus nigerrimus</i> <i>Sidalcea oregana</i> <i>Silene spaldingii</i> <i>Sisyrinchium montanum</i> <i>Tauschia tenuissima</i>	loco weed Nez Perce mariposa lily slender lipfern, slender lip fern, fee lipfern prickly pear sharp-fruit rush, tapertip rush globe penstemon Clearwater phlox fruitleaf knowweed, denseflower knotweed, fruitleaf knotweed straightbeak buttercup desert gooseberry dark raspberry Oregon checkermallow, Oregon checkerbloom Spalding's silene blue-eyed grass Leiberg's umbrellawort

For More Information:

Upper Columbia Basin Inventory and Monitoring Network
<http://science.nature.nps.gov/im/units/ucbn/>