

**Plant Propagation Protocol for *[Insert Species]***

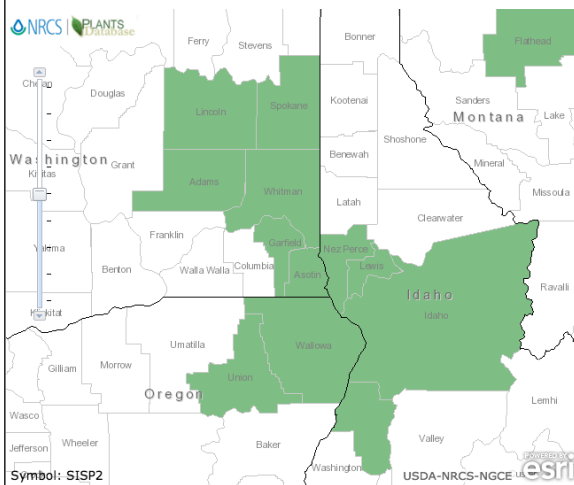
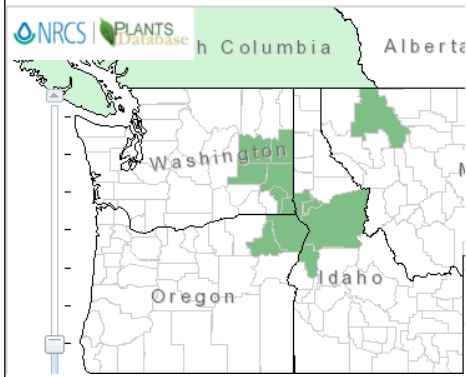
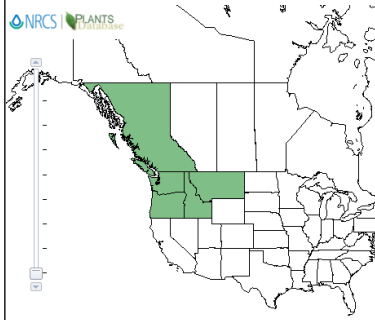
ESRM 412 – Native Plant Production

Protocol URL: [https://courses.washington.edu/esrm412/protocols/\[SISP2.pdf\]](https://courses.washington.edu/esrm412/protocols/[SISP2.pdf])

<b>TAXONOMY</b>	
Plant Family	Caryophyllaceae (USDOJ)
Scientific Name	<i>Silene spaldingii</i>
Common Name	Spalding's Catchfly (USDA)
Species Scientific Name	<i>Silene spaldingii</i> S. Watson (USDA)
Scientific Name	<i>Silene spaldingii</i> S. Watson (USDA)
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	<i>Silene spaldingii</i> S. Watson (USDA)
Common Name(s)	Spalding's Catchfly, Spalding's campion, Spalding's silene (USDA)
Species Code (as per USDA Plants database)	SISP2
<b>GENERAL INFORMATION</b>	

Geographic  
al range

*Silene spaldingii* is found only within a very small geographic location -- spanning from western Montana, through Northern Idaho and Eastern Washington/  
Northeastern Oregon, up to southern British Columbia. It is found in isolated populations, making it appear mosaic-like on maps. This is due to human caused disturbance to ecosystems through agriculture and urbanization (Gamon 2009).



Ecological distribution	Open sagebrush-steppe ecosystems. Predominantly found in the moist soils of the north facing aspects on slopes within bunchgrass grassland communities (Oregon DOA).
Climate and elevation range	Climate: Requires hot, dry summers and cool moist winters. Relies on 45-65% of precipitation (254-610 mm annually depending on the region) during winter, so that the summer dry months do not dehydrate the plant (USDOI Fish and Wildlife Service 2007).  Elevation Range: 365-1615 m (1200-5300 ft.) (National Park Service USDOI).
Local habitat and abundance	Abundance: <i>Silene spaldingii</i> is very low in abundance throughout its native range. It was listed as threatened in October of 2001 by the USDOI Fish and Wildlife Service. Today, it is listed as a threatened species in Idaho and Washington, and as endangered in Oregon (USDA NRCS).  Local Habitat: There are many other <i>Silene</i> species within the bunchgrass communities of <i>Silene spaldingii</i> . The most abundant being <i>Silene scouleri</i> , <i>Silene oregana</i> , <i>Silene douglasii</i> , <i>Silene csereii</i> , and <i>Silene scaposa</i> var. <i>scaposa</i> .  Associated species of varying genus and families are: <i>Festuca idahoensis</i> , <i>Festuca scabrella</i> , <i>Pseudoroegneria spicata</i> , <i>Artemisia tridentata</i> , <i>Artemisia tripartita</i> , <i>Pinus ponderosa</i> , <i>Crataegus douglasii</i> , <i>Symphoricarpos albus</i> (Oregon DOA), <i>Agropyron spicatum</i> , <i>Rosa nutkana</i> , <i>Geum triflorum</i> , <i>Geranium viscosissum</i> , and <i>Balsamorhiza sagittata</i> (USDOI Fish and Wildlife Service).
Plant strategy type / successional stage	Late successional -- flowers in July and August. Not particularly weedy or competitive (Montana Official State Website 2019).
Plant characteristics	<i>Silene spaldingii</i> is a perennial forb. It loses its stems each fall, and emerges in spring annually from its woody root crown. Mature plants have multiple greenish-yellow stems, and overall generally grow up to 30 inches. They have deep taproots (usually longer than 3 feet) and covering the stems are sticky hairs, which act as a fly trap. This is where the common name Spalding's catchfly originates (USDA NRCS).
<b>PROPAGATION DETAILS</b>	

Ecotype	Seeds have only been collected from 6 populations for storage and propagation, in attempts to maintain the biodiversity still found in the individual plants present throughout the Northwest (USDOI Fish and Wildlife Service 2007).
Propagation Goal	Seeds (USDA NRCS).
Propagation Method	<i>Silene spaldingii</i> reproduces exclusively by seed. Offspring are significantly more fit if cross pollination occurs. The most common pollinators for <i>Silene spaldingii</i> are bumblebees (USDA NRCS).
Product Type	Seeds collected from existing populations and stored in stock facilities until ready to be planted (USDOI Fish and Wildlife Service 2007).
Stock Type	Seeds (USDA NRCS).
Time to Grow	The extensive taproot makes <i>Silene spaldingii</i> very difficult to outplant without damage, so outplanting must be done before the plant reaches maturity, which is between 2-3 years. Young plants can be outplanted after just one growing season (USDOI Fish and Wildlife Service 2007).
Target Specifications	Seeds are collected from different populations of <i>Silene spaldingii</i> in order to preserve biodiversity. Collection of seeds from isolated populations all over the native region is imperative in order to collect a representative sample of the diversity within the species. No specific target sized plants, as that would limit species fitness and diversity (USDOI Fish and Wildlife Service 2007).
Propagation Instructions	Seeds are to be collected at the start of fall, when mature plants have dropped their flowers (USDOI Fish and Wildlife Service 2007). Flowers are to be collected, as they each contain approximately 150 seeds.
Propagation/Processing/Characteristics	Seed density: <i>Silene spaldingii</i> plants have anywhere from three to over a hundred small flowers within an inflorescence near the apical meristem. Each fertilized flower produces up to 150 seeds, making for a high seed density per pound, when flowers are collected (USDOI Fish and Wildlife Service 2007).  Seed longevity is unknown, as further research must be conducted in order to know how long <i>Silene spaldingii</i> seeds can remain viable in the ground (USDOI Fish and Wildlife Service 2007). Competing species, such as <i>Centaurea solstitialis</i> , produce seeds that remain viable for 10 years underground, posing significant threat to existing populations of <i>Silene spaldingii</i> (Federal Register National Archives 2001).  Seeds of <i>Silene spaldingii</i> have been found in a dormancy period of several years, however it is unclear what the usual dormancy period is (ECOS USFWS). The current hypothesis is that some years have much less water than others, and this reduced moisture availability increases dormancy periods (Montana Official State Website 2019).

Pre-Planting Propagule Treatments	More research is needed on the ideal dormancy period for the seeds of <i>Silene spaldingii</i> in terms of germination testing. Propagule banks are being implemented for storage purposes, and 6 populations of <i>Silene spaldingii</i> have been collected from and stored. After running laboratory tests, seed germination was found to significantly increase after a 4-8 week cold stratification window (USDA NRCS).
Growing Area Preparation / Annual Practices for Perennial Crops	Seedlings germinate almost immediately when put in small containers in loess rich, moist growing media (USDOI Fish and Wildlife Service 2007).
Establishment Phase Details	Seeds undergo a 4-8 week dormancy period before establishing to germinate. Temperatures get low during this establishment phase, and water is generally abundant within the soil (USDA NRCS).
Length of Establishment Phase	4-8 weeks (USDA NRCS).
Active Growth Phase	Active growth occurs during the spring and summer months, and sometimes late into September (USDA NRCS).
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Hardening Phase	Mature plants generally drop flowers at the end of August and begin to die back for winter. Active growth begins in the early spring months; however, flowers do not emerge until mid-late summer (USDOI Fish and Wildlife Service 2007).
Length of Hardening Phase	Mature plants generally drop flowers at the end of August and begin to die back for winter. Active growth begins in the early spring months; however, flowers do not emerge until mid-late summer (USDOI Fish and Wildlife Service 2007).
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A -- not known. More research needed (USDOI Fish and Wildlife Service 2007).

<p>Guidelines for Outplanting / Performance on Typical Sites</p>	<p>Plants do not flower until they have undergone 2-3 growing seasons. Mature plants are generally 20-40 inches tall, and have a deep 3 foot taproot (ECOS USFWS).</p>
<p>Other Comments</p>	<p>This species is very susceptible to being outcompeted by invasive species. It is very adapted to its evolutionary environment, which has had a close relationship with periodic fires and summer droughts. Because of the suppression of fire and the changing climate, <i>Silene spaldingii</i> is struggling to adapt quickly enough to remain abundant in terms of population (Gamon 2009).</p>
<p><b>INFORMATION SOURCES</b></p>	

References	<p>Camp, P., &amp; Gamon, J. G. (2011). <i>Silene Spaldingii</i>. <i>Field Guide to the Rare Plants of Washington</i>. Retrieved May 28, 2019, from <a href="https://www.dnr.wa.gov/publications/amp_nh_sisp2.pdf">https://www.dnr.wa.gov/publications/amp_nh_sisp2.pdf</a></p> <p>ECOS. (n.d.). Spalding's Catchfly (<i>Silene spaldingii</i>). <i>U.S. Fish &amp; Wildlife Service</i>. Retrieved May 28, 2019, from <a href="https://ecos.fws.gov/ecp0/profile/speciesProfile?sid=3681">https://ecos.fws.gov/ecp0/profile/speciesProfile?sid=3681</a>.</p> <p>Gamon, J. (2009). <i>Silene Spaldingii</i>. <i>Climate Change Sensitivity Database</i>. Retrieved from <a href="https://www.dnr.wa.gov/publications/amp_nh_ccsd_sisp.pdf">https://www.dnr.wa.gov/publications/amp_nh_ccsd_sisp.pdf</a>.</p> <p>Montana Natural Heritage Program. (n.d.). Spalding's Catchfly - <i>Silene spaldingii</i>. Retrieved May 28, 2019, from <a href="http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDCAR0U1S0">http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDCAR0U1S0</a></p> <p>National Park Service. (n.d.). Nez Perce National Historical Park Natural Resource Brief. <i>U.S. Department of the Interior</i>. Retrieved May 28, 2019, from <a href="https://www.nps.gov/nepe/planyourvisit/upload/NEPE_Spaldings_catchfly.pdf">https://www.nps.gov/nepe/planyourvisit/upload/NEPE_Spaldings_catchfly.pdf</a>.</p> <p>Oregon Department of Agriculture. (n.d.). Spalding's campion (<i>Silene spaldingii</i>). <i>Oregon Department of Agriculture</i>. Retrieved May 28, 2019, from <a href="https://www.oregon.gov/ODA/shared/Documents/Publications/PlantConservation/SileneSpaldingiiProfile.pdf">https://www.oregon.gov/ODA/shared/Documents/Publications/PlantConservation/SileneSpaldingiiProfile.pdf</a>.</p> <p>Oregon Fish and Wildlife Office. (n.d.). Spalding's Catchfly. <i>U.S. Fish &amp; Wildlife Service</i>. Retrieved May 28, 2019, from <a href="https://www.fws.gov/oregonfwo/articles.cfm?id=149489451">https://www.fws.gov/oregonfwo/articles.cfm?id=149489451</a>.</p> <p>U.S. Department of Agriculture. (n.d.). <i>Silene spaldingii</i> S. Watson Show All Spalding's silene. Retrieved May 28, 2019, from <a href="https://plants.usda.gov/core/profile?symbol=SISP2">https://plants.usda.gov/core/profile?symbol=SISP2</a></p> <p>U.S. Department of Agriculture. (n.d.). SPALDING'S CATCHFLY <i>Silene spaldingii</i>. <i>United States Department of Agriculture</i>. Retrieved May 28, 2019, from <a href="https://plants.usda.gov/plantguide/pdf/pg_sisp2.pdf">https://plants.usda.gov/plantguide/pdf/pg_sisp2.pdf</a>.</p> <p>U.S. Fish and Wildlife Service. (2007). Recover Plan for <i>Silene Spaldingii</i>. <i>U.S. Fish &amp; Wildlife Service</i>. Retrieved May 28, 2019, from <a href="https://www.fws.gov/montanafieldoffice/Endangered_Species/Recovery_and_Mgmt_Plans/Spaldings_Campion_Recovery_Plan.pdf">https://www.fws.gov/montanafieldoffice/Endangered_Species/Recovery_and_Mgmt_Plans/Spaldings_Campion_Recovery_Plan.pdf</a></p>
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<p>Other Sources Consulted</p>	<p>Hill, J. L., &amp; Gray, K. L. (2004). Conservation Strategy for Spalding's Catchfly. <i>Conservation Data Center Idaho Department of Fish and Game</i>. Retrieved May 28, 2019, from <a href="https://idfg.idaho.gov/ifwis/idnhp/cdc_pdf/u04hil01.pdf">https://idfg.idaho.gov/ifwis/idnhp/cdc_pdf/u04hil01.pdf</a>.</p> <p>Snake River Fish and Wildlife Office. (n.d.). SPECIES FACTS: SPALDING'S CATCHFLY. <i>U.S. Fish &amp; Wildlife Service</i>. Retrieved May 28, 2019, from <a href="https://www.fws.gov/pacific/news/2006/Silene_drft.pdf">https://www.fws.gov/pacific/news/2006/Silene_drft.pdf</a>.</p>
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