Institute for Applied Ecology

Dedicated to native ecosystem conservation, research, and education

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CURRENT PROJECTS

REGIONAL STRATEGIES FOR RESTORING NATIVE PRAIRIES

In collaboration with the Nature Conservancy, the Institute for Applied Ecology is conducting a five-year, regional study exploring restoration of upland prairies. This is an experimental test of restoration methods and includes sites in southern British Columbia, Washington, and the Willamette Valley. The over-all objectives of this project are to:
(1) Evaluate and improve strategies for controlling the abundance of invasive non-native herbaceous weeds, while maintaining or enhancing the abundance and diversity of native plant species, and
(2) Develop an approach to generalize these results so that they can be applied by land managers engaged in prairie stewardship throughout the region.

BENTON COUNTY HABITAT CONSERVATION PLAN

IAE is cooperating with Benton County to develop a Multi-Species Habitat Conservation Plan (HCP) for seven threatened or endangered species that occur within the County: four plants, *Lupinus sulphureus* ssp. *kincaidii* (Kincaid's lupine), *Erigeron decumbens* (Willamette daisy), *Senecio nelsonii* (Nelson's checkermallow), *Lomatium bradshawii* (Bradshaw's lomatium); two butterflies, *Icaricia icarioides fenderi* (Fender's blue butterfly**),** *Euphydryas editha taylori* (Taylor's checkerspot); and *Eremophila alpestris strigata* (the streaked horned lark). The HCP is a step towards obtaining an incidental take permit under the Endangered Species Act. The permit will allow Benton County to continue to perform its road and park maintenance activities and land-use permitting while promoting threatened and endangered species conservation. The HCP will describe how Benton County intends to avoid, minimize and mitigate any harm to the species covered by the plan.

My role of IAE is to coordinate public outreach and education related to the HCP or listed species and habitats, conduct field assessments to increase our knowledge of the distribution of habitats and populations of listed species, develop a GIS database of habitat and species information, and analyze data for the development of a viable HCP.

RESTORATION AND REINTRODUCTION EDUCATION (RARE) PARTNERSHIP

IAE's Education and Outreach Program working with local schools to restore prairie habitat and reintroduce local threatened and endangered species. Activities of this project include in-class education about native species, habitats, and restoration, and involving students in growing native species in the greenhouse and planting them in native habitats.

NATIVE SEED NETWORK

The Native Seed Network is a resource for both the restoration community and the native seed industry, providing powerful search tools and information on all aspects of native seed. The NSN works with public agencies, educators and private groups to increase the availability of affordable native plant materials from local genetic sources.

In 2006, the NSN became a partner in the Wetland Reserve Enhancment Program. The goal of this project is to enhance species diversity of wetlands that were restored through the USDA Natural Resources Conservation Service Wetland Reserve Program.

CONSERVATION RESEARCH

We are currently involved in several projects whose main goals is to gain a better understanding of the biology of rare species and utilize this knowledge to direct restoration and management. These studies include developing seed germination and plant propagation methods, field studies with direct seeding and transplants, follow -up monitoring to determine effective site preparation strategies, comparing treatments (including herbicides, mowing, and burning), using exclosures to determine the effects of grazing, and long-term demographic studies.

The species that we are currently studying include,
Abronia umbellata ssp. *breviflora (Pink sand verbena)*
Astragalus tyghensis (Tygh Valley Milkvetch)
Calochortus greenei (Greene's mariposa lily)
Castilleja levisecta (golden paintbrush)
Cypripedium fasciculatum (clustered lady's slipper)
Eucephalis (Aster) vialis (Wayside aster)
Erigeron decumbens (Willamette daisy)
Fritillaria gentneri (Gentner's fritillary)
Lomatium bradshawii (Bradshaw's Lomatium)
Lomatium cookii (Cook's Desert Parsley)
Lupinus sulphureus ssp. kincaidii (Kincaid's lupine)
Senecio ertterae (Ertter's senecio)

CONSERVATION RESEARCH PROJECTS

Abronia umbellata ssp. *breviflora* research and reintroduction

Pink sand-verbena (*Abronia umbellata* ssp. *breviflora*) is listed by the Oregon Department of Agriculture as endangered, and it is considered a Species of Concern by the U.S. Fish and Wildlife Service. Historically, the species was known from beaches along the Pacific Coast from Vancouver Island (British Columbia) south to northern California. The species is now believed to be extinct in Washington, and is known from only a few populations in Oregon and California. Since 1997, IAE has been involved in reintroducing and monitoring *Abronia* at 14 sites on the Oregon coast. Funds for this work are made available, in part, from the Coos Bay District, BLM and the Siuslaw National Forest.

Eucephalis (Aster) vialis research and restoration

The goal of this research and restoration plan is to improve habitat for, and connectivity between, populations of *Aster vialis*. Based on a review of available information, we believe the species responds favorably to light but may be limited by browsing from deer. Individual plants appear to be very long lived (often > 10 years and possible more) and recruitment of seedlings is rare. Many populations have suppressed plants that rarely, if ever, flower, probably due to insufficient light and/or deer browsing.

We are currently testing three hypotheses: 1) Opening of the forest canopy will result in the growth and flowering of suppressed individuals; 2) Greenhouse-grown transplants can be moved to a forest environment and successfully grown to establish new populations; and 3) Seedling establishment can be enhanced by artificially exposing mineral soil and sowing seeds.

Long-term population monitoring of (*Lomatium cookii*) Cook's Desert Parsley, Illinois Valley

This endangered species of southern Oregon has a very restricted distribution. IAE staff have been involved in monitoring of this species since 1994, first through a state agency (Oregon Department of Agriculture) and more recently through IAE, with funding from the Medford District, BLM. The project involves the collection of precise demographic information to provide basic information on the life-history of this poorly known plant and general information on population trends. The primary threats to this species are urban development and mining.

Restoration in Willamette Valley prairies

We are currently involved in several projects whose main goal is to restore wetland and upland prairies in the Willamette Valley. Reintroduction of the rare and endangered species that are native to these sites involves a comprehensive effort to develop seed germination and plant propagation methods, field studies with direct seeding and transplants, and follow -up monitoring to determine effective site preparation strategies and optimal micro-sites for planting. Our partners on these projects include the Eugene District, BLM, (focused in the West Eugene Wetlands), the US Fish and Wildlife Service (focused on Finley and Baskett Butte National Wildlife Refuges), and the City of Corvallis (Bald Hill Park). Focal species include:

Castilleja levisecta (golden paintbrush)
Erigeron decumbens (Willamette daisy)
Lomatium bradshawii (Bradshaw's Lomatium)
Lupinus sulphureus ssp. kincaidii (Kincaid's lupine)

Managing and controlling *Brachypodium sylvaticum*, an invasive perennial grass.
Brachypodium sylvaticum (Huds.) Beauv. (false-brome), is an invasive perennial grass, native to Europe, North Africa, and parts of Asia. Since it was first reported near Eugene, Oregon in 1939, the species has spread rapidly in western Oregon. *Brachypodium sylvaticum* is of considerable concern due to its ability to completely dominate both shaded and open habitats, where it often forms monotypic stands, excluding native vegetation and threatening endangered species, such as *Lupinus sulphureus* ssp. *kincaidii* and *Aster vialis*.

On an experimental road closure we are testing treatment combinations of tilling, mulching to two depths, and seeding with the native perennial grass *Elymus glaucus*. Our goal is to determine which combination results in the largest reduction of *B. sylvaticum* and the greatest re-establishment of native plant cover. We are also exploring feedback interactions between *B. sylvaticum* and the soil ecosystem, and the extent to which these interactions affect native plants.

The effects of cattle grazing on *Calochortus greenei* (Greene's mariposa lily)
Calochortus greenei S. Wats., Greene's Mariposa Lily, is listed by the United States Fish and Wildlife Service (USFWS) as a federal species of concern (C2), and is proposed for listing as a threatened species in Oregon. It is also a Bureau of Land Management (BLM) special status species. *Calochortus greenei* occurs in grassland, shrubland and oak woodland habitats on both sides of the California-Oregon border. Many areas supporting *Calochortus greenei* have been influenced by livestock, and are experiencing substantial invasion by non-native species. The Institute for Applied Ecology is conducting a long-term study in Cascade-Siskiyou National Monument to determine the influence of cattle grazing on the population dynamics of *C. greenei* and inform management actions in the Monument.

***Cypripedium fasciculatum* population monitoring**
Cypripedium fasciculatum (clustered lady's slipper) is a rare woodland orchid that occurs in coniferous forests. In cooperation with the Medford Distrcit, BLM, we are conducting research to,
(1) Assess the status and demographic structure of *C. fasciculatum* populations in southwestern Oregon,
(2) Describe habitat characteristics and relationship of the species population characteristics to major environmental variables,
(3) Identify biological traits useful in monitoring, and
(4) Evaluate the effects of thinning and ground disturbance on *C. fasciculatum* populations.

Population monitoring of *Fritillaria gentneri* (Gentner's fritillary)
The purpose of this multi-year project is to monitor one of the largest known populations of *Fritillaria gentneri* (Gentner's fritillary), an endangered lily family. Population data gathered during this long-term study will provide important information on the status, dynamics, and trends of the Picket Creek *F. gentneri* population and serve as a useful demographic baseline for evaluating population responses to habitat changes caused by natural forces and/or prescribed land management actions. The monitoring protocols developed at Picket Creek will also give BLM and other land management agencies a useful template for monitoring *F. gentneri* at other locations. In addition, we are supplementing the current population by out-planting bulbs that have been propagated in the greenhouse.

***Senecio erterrae* seed bank dynamics**
In cooperation with the Vale District BLM, we are conducting research on the seed bank dynamics of *Senecio ertterae* (Ertter's senecio) in the Leslie Gulch Area of Critical Environmental Concern. This research will help us understand demographic processes in this species and predict the response of its populations to climatic conditions, environmental disturbances, and management actions that affect seed production.