Camas

By Susan Kephart

Camas is a North American bulb-forming geophyte whose greatest diversity lies in Oregon, home to over 65 percent of the named species. The names *Camassia*, *camas*, *qém'es*, *quamash*, and *pa-siko* all refer to the group of spring herbs whose white to blue-purple flowers form spectacular displays in wetlands, grasslands, and oak savannas in the Pacific Northwest.

From California to coastal British Columbia, Indigenous peoples used camas bulbs extensively for food, along with salmon, acorns, and other foodstuff. The bulbs were valued as sweeteners and were shared or traded as gifts at weddings and funerals. Traditional harvest sites and practices were carefully passed down across generations. From spring to late summer, women dug the bulbs with special sticks crafted of wood and animal antlers. After harvest, the bulbs might be ground and stored in cake form. At special gatherings, families baked the bulbs in deep earthen ovens, cooking them over hot stones, layered with branches of shrubs, herbs, and trees until tender and sweet.

Tribes such as the Kalapuyans of the Willamette Valley actively traded camas. In 1805, the Nez Perce shared their bulbs with members of the Lewis and Clark Expedition on Quawmash flats (Weippe Prairie in present-day Idaho), rescuing the party from near starvation. The explorers suffered gastrointestinal misery from eating the camas, yet on their return trip to the East the next spring Meriwether Lewis observed *en masse* the profuse blooms that "resemble lakes of fine clear water." At Quawmash flats, he collected the first specimen, or holotype, that today is associated with the most common species of western camas, *Camassia quamash*.

In Oregon and adjoining states, camas plants vary greatly in form and ecology, with ten different subspecies and four species growing at elevations from sea level to 3,300 meters. *Camassia* flowers from April to June in a climate that ranges from Mount Hebo on the north Oregon Coast to the remote reaches of Hells Canyon Overlook (i.e., Cusick's camas) in eastern Oregon. In southwest Oregon, the rarer Howell's camas grows on unusual serpentine-derived soils in Douglas County.

The Willamette Valley harbors the two most common, often co-occurring species: *C. leichtlinii* and *C. quamash*. *Camassia leichtlinii*, or great camas, the larger of the two, is mainly limited to sites west of the Cascade Mountains while subspecies of *C. quamash* extend from the Oregon Coast to Montana. Molecular and morphological studies show that both species are genetically distinct, despite some hybridization. All species are ecologically important for their abundance and for the nutrition they provide to diverse spring pollinators and animals such as the camas pocket gopher (*Thomomys bulbivorus*). Camas "lilies" are important culturally and ecologically, and three of the Oregon species are available as garden cultivars. In southwest Oregon, villagers at Coos Bay and along the Coquille River harvested both *Brodiaea* and camas, and the Northern Paiutes dug fernleaf biscuitroot (*Lomatium*) for medicinal uses.

Today, existing camas populations with ecological, cultural, and genetic value, are at risk for multiple reasons that, if addressed, can yield solutions that will sustain future communities of plants, animals, and humans. By 2020, vascular plant extinction globally and in the continental U.S and Canada since European settlement have declined markedly due to climate change, population growth, and land use patterns. Indigenous and local knowledge (ILK), linked with new conservation research, are fostering synergistic results that in collaborative studies retain ecosystem function, resilience, taxonomic integrity, and community diversity.

As a cultural and ecological keystone species, camas is highly valued for restoration in wet prairies, wetlands, and savannas by nongovernmental organizations, tribal organizations and government agencies. Within the 110 ha Weippe Prairie National Historic Landmark, National Park Service scientists and Nez Perce specialists guided a multiyear experiment using traditional resource management (TRM). In 50 permanent plots, embedded in wild camas populations, they tested burning and bulb digging against controls, finding that combining treatments in a five-to-six-year harvest cycle allows sustainable harvest and effective population recovery. Recent studies of Pacific Northwest-California *Camassia* imply high within-species variability, wide-ranging habitats (low coastal or inland wetlands to montane outcrops), and tolerance to summer drought with

deep-seated bulbs; generalist pollinators can also equip *Camassia* well in changing climates, provided water is accessible for bud-flower production. Retaining resilient communities and augmenting camas populations by sharing all conservation tools and practices remains critical, since its spring dominance affects entire communities in habitats converted for agriculture, transportation, and urban development.

In Oregon and elsewhere, Indigenous communities continue to harvest camas to commemorate its role in their cultural history. Recent dated archaeological and paleobotanical analyses of carbonized bulbs show that Native peoples have been actively maintaining camas or modifying harvest strategies for several millennia. Camas still grows on Native American reservations despite past and ongoing injustices, yet much more is needed to sustain ecological and indigenous communities. To solve the complex issues of the future and to meet the threats to lands, stewardship rights, and resources, global teams of scientists across diverse backgrounds (e.g., archaeology, biology, socioeconomics) have called for equitable change; their recommendations include creating educational programs to reduce cultural bias and prioritizing the restoration of keystone species. They also urge finding more ways to revitalize the transmission of traditional cultural practices intergenerationally and to apply them today while historical memory still exists.

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