



FADING GOLD QUAKING ASPEN IN OUR FORESTS

In the mountains of northern California, deciduous aspen groves are oases of plant and animal diversity in a vast sea of shady conifer forest. Abundant sunlight, moisture and occasional wildfire or other disturbance keep aspen groves vigorous and the understory rich with a diversity of grasses, wildflowers and shrubs.

In the past century, this environment has changed because of the absence of wildfire, combined with repeated grazing of young aspen. Conifer seedlings that would have been killed by fire have invaded, overtopped, and shaded out the aspen. Like giant drinking straws, these conifers drew water from the soil. As the soil became drier and shade more dense, aspen have faded out and even disappeared in some sites. Biologists expect the loss of aspen to have a cascading effect on other plants and animals that depend on this vital habitat.

ASPEN RESTORATION

In northern California, successful aspen restoration projects have clearly demonstrated that the greatest threat to continued aspen existence is to do nothing. Without regular disruption of encroaching conifers, aspen will eventually disappear. Active intervention -- thinning out conifers, burning, and protecting sprouts from browsing during re-establishment -- are needed to restore aspen groves to their historical role in our landscape. The Shasta-McCloud Management Unit, in cooperation with the Rocky Mountain Elk Foundation, has created a stewardship program to remove encroaching conifers from dying aspen stands in the Hambone area to restore elk habitat. Future aspen restoration projects in other areas of the forest are likely.

WILDLIFE HABITAT

Elk and mule deer forage on aspen seedlings along with the lush wildflowers and grasses. Beaver have a strong preference for aspen as food and building material, and were abundant in Siskiyou County in the past. Many birds are drawn to quaking aspen for nesting cavities and plentiful insects to eat. The Lewis's woodpecker, flammulated owl, and northern goshawk all nest and forage in our aspen groves.

HOW TO KNOW A HEALTHY ASPEN GROVE

A healthy aspen grove includes sprouts, saplings, and mature trees that make it difficult to see through. If only older trees can be seen, with no younger sprouts or saplings to replace them as they die, the grove is in danger of disappearing.

BLACK OAK WOODLANDS

BREAD BASKET OF THE PEOPLE



Black oak (*Quercus kelloggii*) is a tree revered by the native people of northern California. The flavorful, oil-rich acorns of this oak are preferred over other oak species as food because of their superior taste and the pudding-like texture of the cooked meal. Acorn meal was made into mush, soup, and bread. Preparation was a time consuming process: first acorn shells and bitter red skins were removed, then the acorns were pounded into flour, the flour was leached of bitter tannins by repeated applications of water, and finally the meal was cooked in baskets with hot stones. The tradition of preparing acorn bread is still practiced today, although modern appliances may help with pounding, sifting, leaching, and cooking.

NATIVE AMERICANS AND FIRE

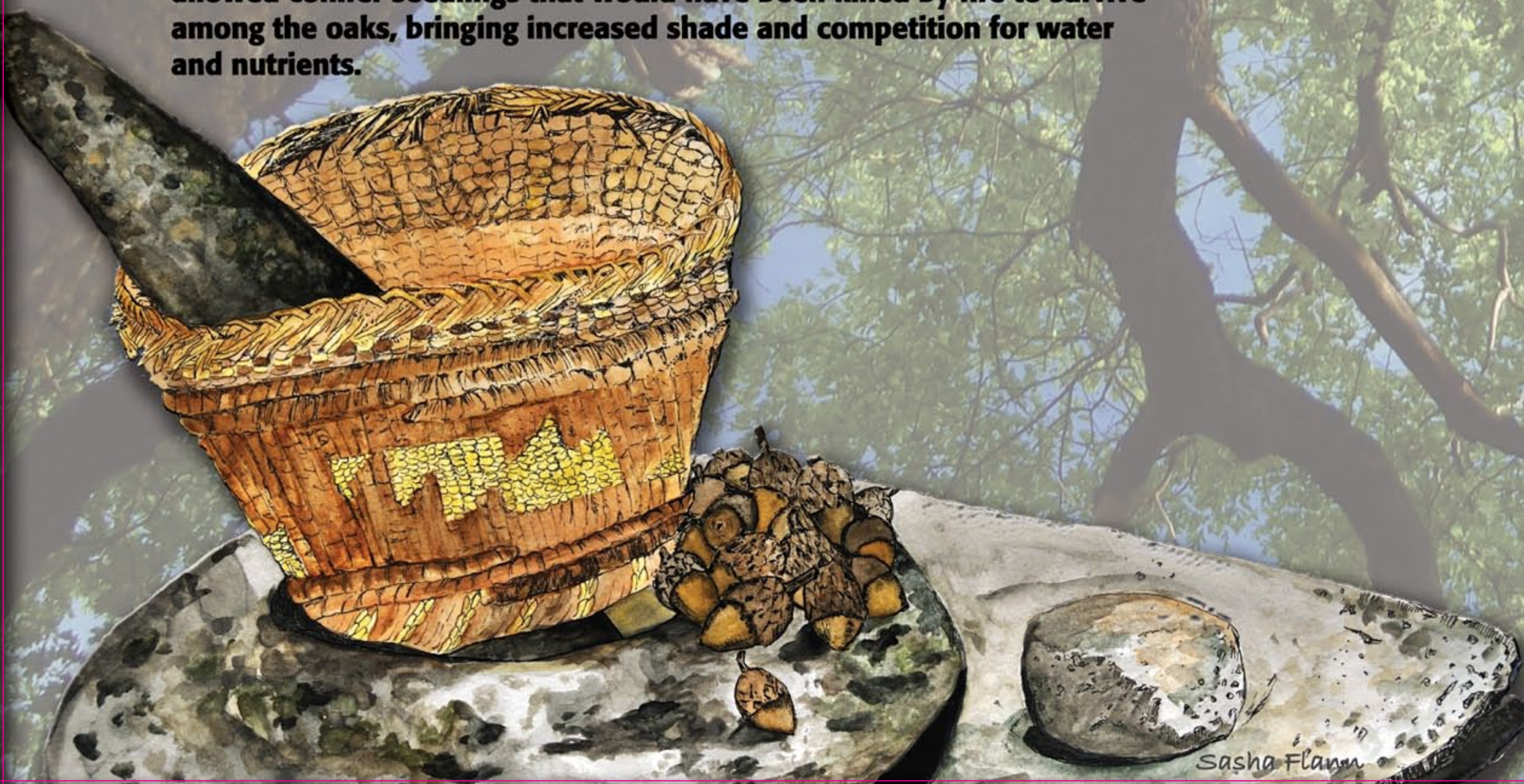
Native Americans burned stands of black oak frequently, to keep them free of conifer trees, to improve acorn crops, reduce insect infestations, to maintain openings for hunting, and to promote sprouting of other fire-adapted species used for food, cordage, medicine and basketry. Black oak is not tolerant of shading, but happily re-establishes after fire by aggressive basal sprouting and by germination of acorns cached by rodents. Black oaks were also sometimes pruned and thinned to enhance acorn production.

Pure stands of black oak are less common today than under historic native burning practices. Fire suppression in the past century has allowed conifer seedlings that would have been killed by fire to survive among the oaks, bringing increased shade and competition for water and nutrients.

HOW NATIVE AMERICANS USED THE PLANTS OF THE BLACK OAK WOODLANDS

Other plants in the black oak woodland were important in the daily lives of Native Americans. Can you find these plants in our display garden?

- Food: elderberry, gooseberry, currant, chokecherry, hazelnut, blackcap raspberry, Shasta lily, serviceberry, mountain strawberry, Klamath plum, coyote mint and scarlet gilia
- Arrow Shafts: mock orange, hazelnut and rose
- Cordage: milkweed, hazelnut and dogbane
- Medicine: yarrow, Oregon-grape, prince's pine, lupine, mugwort-goldenbush, everlasting, goldenrod and sulfur buckwheat
- Basketry: redbud
- Dye: Oregon grape
- Musical Instruments: elderberry



Sasha Flann

WELCOME TO THE SHASTA-MCCLLOUD NATIVE PLANT INTERPRETIVE GARDEN!

This garden, greenhouse and nursery are all part of the Shasta-Trinity National Forest's restoration program. Work started in 1993 with a grant from the McConnell Foundation to build a greenhouse for growing plants to restore Panther Meadows on Mt Shasta. The native plant display garden you are about to explore was begun in 2006. The Panther Meadows project and many others that followed were developed in cooperation with local tribes, the Youth Conservation Corps and community volunteers. We are grateful for their support.



LET THE SUN SHINE IN!

Most flowering plants need plenty of sun to grow and reproduce. Because plants need sunlight to make food, the understory of a dark, closed-canopy conifer forest is a difficult place to survive. Plants of dark forests must find other sources of nutrition, often partnering with fungi that penetrate tree roots.

In the Cascade and Klamath Mountains of Northern California, some of our most wildflower-rich native plant communities are declining because abundant sunlight no longer reaches the forest floor. A century of fire suppression has allowed conifer tree seedlings to survive and shade out sun-loving plants. Reducing the density of trees in the forest and creating openings can restore wildflowers and sun-loving woody plants to their rightful place in our native landscapes.

This garden highlights the beauty, diversity, and value -- to humans and other species -- of aspen groves, black oak woodlands, wet and dry mountain meadows and rocky serpentine plant communities.

Thinking about the natural consequences of diminishing sunlight in the forest is a new concept for many people. We encourage you to learn more. One good place to start is the Forest Service Celebrating Wildflowers website at www.fs.fed.us/wildflowers/.



Shasta-Trinity National Forest



A PARADE OF POLLINATORS FOLLOW THE SUN



Sunny openings in our forests are hotspots for wildflowers and flowering shrubs that provide food for pollinators. In exchange, the pollinators (bees, butterflies, birds, bats, beetles, moths, wasps and ants) provide the pollen-moving labor necessary to make seeds and fruits. People reap the benefits too, because without pollination, much of the food we eat would never come to be.

POLLINATION IN A NUTSHELL

A plant pollinator moves from plant to plant and, as it forages for nectar or pollen, tiny pollen grains get stuck in its hair-like seeds stuck in your socks. As the pollinator moves on in search of more food, this pollen is brushed onto another flower's receptive female flower part, called a stigma. For fertilization to occur the pollen must come from a plant of the same species (individuals capable of interbreeding with one another). If fertilization is successful, the plant ovary (fruit) expands and the ovule grows into a mature seed. The seed, sometimes contained in a tasty fruit, is then available to us as food—if we get there first.

GARDENING FOR NATIVE POLLINATORS

This garden demonstrates the abundance of pollinators attracted to native plants of northern California and beauty of both wildflowers and pollinators. By planning and experimenting, we can grow plants with different flowering times, colors, and shapes, providing a constant supply of food for diverse pollinators throughout the growing season.

POLLINATORS: SOME ARE PICKY - SOME ARE NOT

Many pollinators are generalists; they are not very particular about which plant provides their food. Others are specialists, requiring specific plants for some part of their life cycle. For instance, Monarch butterfly caterpillars eat only milkweed, but adults use nectar from many different plants.





KLAMATH-SISKIYOU SERPENTINES ANCIENT REFUGE FOR RARE PLANTS

The Klamath-Siskiyou Mountains of northwest California and southwest Oregon are the largest body of serpentine type rock in North America. This challenging and unusual substrate, coupled with the ruggedness, isolation, and great age of these mountains, gave rise to a spectacular flora that is peculiar to this corner of the world.

For a plant to thrive on serpentine soils it must be able to tolerate low calcium and high magnesium levels – the reverse of normal productive soils -- low nitrogen, and concentrations of heavy metals that are toxic to most plants.

Some plants that occur here in the Klamath-Siskiyou Mountains are only found on serpentine soils; other more adaptable plants can live on or off serpentine. The rarest plants in this area are found only on serpentine, and only in a small geographic area. Some examples of very rare and beautiful serpentine plants are Trinity buckwheat (*Eriogonum alpinum*), showy raillardella (*Raillardella pringlei*), Siskiyou fireweed (*Epilobium siskiyouense*), and Scott Mountain phacelia (*Phacelia dalesiana*). Just thirty miles north of this garden, near the town of Yreka, there grows a very rare serpentine plant listed under the Endangered Species Act – Yreka phlox (*Phlox hirsuta*).

