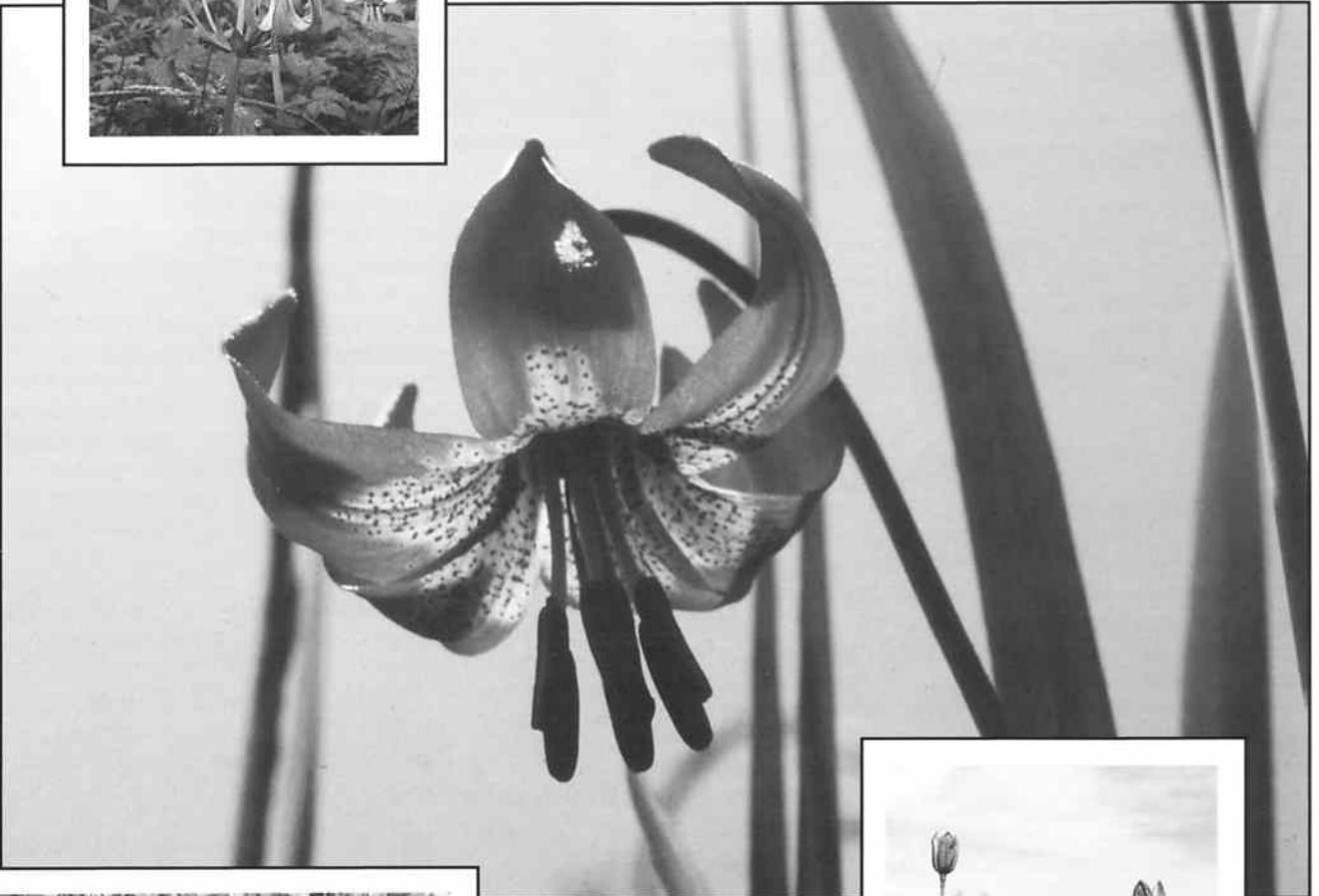




*Candelabra*

*Lilium occidentale*



*Bud and foliage*

PHOTOS BY DAVE IMPER



*Dehiscent capsules*

# Western Lily, *Lilium occidentale* (Liliaceae)

By EDWARD O. GUERRANT, JR.

Like a string of old lighthouses, the endangered western lily (*Lilium occidentale*) is known from a diminishing number of beleaguered coastal locations. Since its discovery around the turn of the century, western lily has been found at some 60 sites, all at low elevations (less than 100 m.) from Coos Bay, Oregon, to Humboldt Bay, California. Superficially, it might seem that a species with so many populations would have a relatively secure future. Nevertheless, there are good reasons it is listed as endangered both federally and by California and Oregon. Indeed, the plight of western lily and the response by concerned citizens, private organizations and public agencies, makes it a veritable poster-child for the struggle faced by native plants everywhere.

## Biology

With a striking golden star in the center of its pendant crimson flowers, and stamens tightly circling its style and stigma, western lily is a distinctive member of an easily recognized genus. Like other lilies, it is an herbaceous perennial that dies back to the ground each fall. Rhizomes (usually called bulbs) may produce one or more flowering shoots each year that may reach a height of 2.5 meters, typically with 1-3 (up to 25 or more) flowers. Seedlings and small juveniles have only a single leaf, with larger plants having linear leaves distributed singly or in 1-9 whorls along the stem.

Western, or bog lily as it is also known, occurs in early to mid-successional bogs or coastal scrub on poorly drained soils, generally those underlain by an iron pan or barely permeable clay layer. It appears to require a habitat that maintains a delicate balance between having some surrounding vegetative structure, but not too much shade. Flowers often emerge from the surrounding shrubby vegetation, where they are exposed to direct sunlight and can be found by hummingbirds, their primary pollinators.

## Threats

Western lily merits endangered status for many reasons. It is hardly surprising for a species that inhabits relatively level ground along a very scenic stretch of coast within a day's drive of two major metropolitan areas to be under intense development pressure. However, an even more menacing long-term threat is competitive exclusion by shrubs and trees, a particularly pernicious threat because it is invisible to the casual observer.

Of the approximately 60 locations at which Western lily populations have ever been seen approximately one third appear to have been extirpated, and the fate of another sixth are unknown. Thus up to half of the known populations have disappeared this century — which works out on average to the loss of one population every three to five years! Over two thirds of the populations that remain have 100 or fewer individuals, and only two have over 1,000.

## Conservation

Although western lily was only listed as endangered by the US Fish and Wildlife Service in 1994, and the recovery plan is still only in draft form, concerted private and public efforts to recover the species have been going on for almost a decade.

The State of California has been actively involved in western lily recovery for almost a decade. In 1987, a management plan was prepared for the Table Bluff Ecological Reserve, near Humboldt Bay, CA. Since that time, Dave Imper and his colleagues have been managing the species at this site for the California Department of Fish and Game. They have been able to experimentally examine the impact of a variety of factors on lily population growth. For example, they have been able to examine the effects on lily population growth rate of selectively cutting spruce trees and limbs to let in more light to a population of chronically suppressed individuals.

Private organizations and landowners have been doing their part too. The California Nature Conservancy's landowner contact program was instrumental in obtaining the active cooperation of several landowners. With their support, Imper has been helping to manage three populations on private land in Humboldt County. Not only are these populations benefiting from active management, we are learning how to manage for this species in ways that might be applied elsewhere. For example, it is primarily through these cooperative efforts that controlled experiments have shown that cattle grazing, if properly controlled, can help reduce competition with shrubs, and thus help maintain a suitable habitat for western lily.

Long term monitoring data, and experimental manual removal of woody competitors have also been applied to populations near the northern end of the range. Stewart Schultz and the Oregon Nature Conservancy have been monitoring a population on Nature Conservancy land for almost a decade. By 1994 the dismal trend toward population extirpation was so clear that active vegetative management was necessary.

The results of these experiments in manual vegetation removal, to temporarily set back, or at least slow down the clock of ecological succession, were sufficiently encouraging that wider application of the practice is being authorized by the US Fish and Wildlife Service. Bruce Rittenhouse (former president of the NPSO) has organized additional vegetative removal projects, and set up experimental fencing to exclude deer, and therefore greatly increase seed production.

We at the Berry Botanic Garden have seeds of many populations throughout the species' range in our Seed Bank. The genetic legacy of those populations are protected from catastrophic loss in the field. If the worst should happen, and a sampled population becomes extirpated and the threat can be addressed, stored seed can be used for reintroduction.

Perhaps the most uplifting aspect of this saga is the degree to which private citizens have become involved in the re-

covery of western lily. Citizens, volunteering their time and expertise have contributed to every aspect of western lily conservation. For example, a monitoring network organized by Imper typifies how important individual action can be. Populations throughout the range have been 'adopted' by local citizens, who monitor them each year with a standard protocol. The long term value to the species of having such information, not to mention the vigilant attention of concerned citizens, is immense.

Conservation of endangered species is not so much a scientific or even technical problem as much as it is a matter of societal will. If we as a society choose to sustain the web of life, we will find a way to do it. The broad based flurry of activity that has assembled itself to help the western lily is a beacon of hope showing us the way in from a dark and stormy sea.

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## Letters

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Editor,

I read with much interest the detailed account of the natural history of the Warm Springs Reservation in the 1995 number of *Kalmiopsis*. Rarely does one find a major Indian reservation to have received such intensive and complete study of its natural amenities. The Yakima Reservation of the Columbia Plateau and the Coastal Indian reservations in British Columbia have been blessed with the scholarly attentions of two ethnobotanists, Drs. Eugene Hunn and Nancy Turner. Note that it is the zeal of ethnobotanists that has made the floras of these native reserves known, both to their indigenous residents and to the latter-day Euro-intruders. It is this ethnobotanical contribution to natural history that prompts me to comment on the need to highlight the Warm Springs studies by the ethnobotanist, Dr. David French. In the Warm Springs article a more fulsome recognition of the contributions of the Frenches, Dave and Kay, and by their young collaborator, Robert Ornduff, should be made.

The Frenches and Ornduff, of Reed College, joined to make a definitive baseline study of the plant life of the reservation.

Professor Dave French compiled during 1952-53 a substantial set of herbarium specimens of their ethnobotanical researches on the reservation. Further, the Frenches continued to collect in later years. The result of this close cooperation was the authoritative published accounts of the Warm Springs flora and vegetation, as cited only in the bibliography of the article.

I had the good fortune to know Dave French and to have been a close friend of Dr. Ornduff ever since Bob was a Reed College student. Ornduff continues to be a productive botanist at the University of California (Berkeley). His early ventures into plant systematics indeed began with his involvement in the Warm Springs flora and vegetation.

So, for the sections of the *Kalmiopsis* article on the botany of the Warm Springs Reservation, the proper acknowledgment of the significant contributions of the Frenches and of Dr. Robert Ornduff is herewith provided.

— A.R. Kruckeberg  
Emeritus Professor





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