THE SPECIES LILY

The Newsletter of the
Species Lily Preservation Group
Affiliated with The North American Lily Society

L. candidum

Autumn 2001

SLPG GOALS

* Growing as many species as possible, especially those rare and in danger of extinction
* Making excess species bulbs available to members
* Collecting, preserving, planting, growing and distributing species seed
* Collecting all possible information on each species: its habitat, distribution, cultural needs, etc.
* Disseminating cultural information on each species
* Assembling a slide and photo record of all species lilies
* Identifying areas where specific species grow and seeking protection for these areas

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Board of Directors

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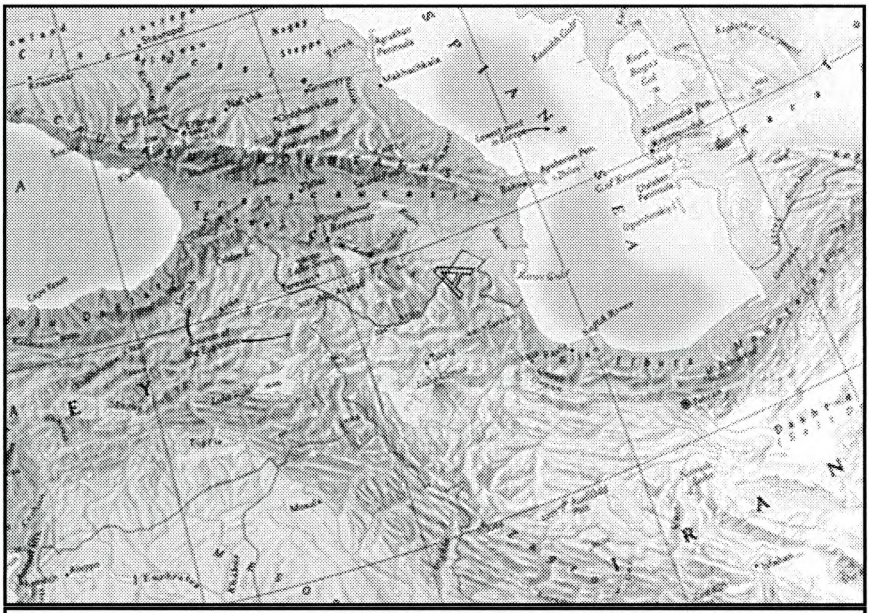
Antra Balode, Riga, Latvia



The Caucasian Mountains run roughly east-west between the Black Sea to the west and the Caspian Sea to the east. Along the south-west side of the Caspian Sea are the Talish Mountains, and the Elburz Mountains are just south of the Caspian Sea.

The Caucasian Mountains boast exotic species of lilies — found in tall grasses, from sub-alpine to alpine meadows, forests and slopes. According to publications (e.g. Medver, 1919; Mandenova, 1972), Caucasian lilies are pre-ice age plants that still thrive in their montane habitats. During the ice age, these mountains provided a refuge and, as fossil findings are reported to indicate, eventually became a center from which these plants spread to other regions.

In the eighteenth century, the first publications about Caucasian lilies appeared. As early as 1703, Tournefort wrote about Caucasian lilies — their very fragrant, large yellow flowers.

In the nineteenth century, the flora in Caucasus was researched more

thoroughly than ever before. In 1808, Bieberstein gave a scientific account of *L. monadelphum* which he had found in the Pyatagorska region [north of the Caucasus Mountains, approximately midway between the Black and Caspian Season] on the Beshtau slopes. At the same time, Bieberstein mentions yet another lily: *L. martagon* var. *caucasicum.* In 1830, botanist Szovits collected bulbs of Transcaucasian lilies that yielded yellow flowers with bright orange pollen. In 1939, this species was introduced as *L. szovitsianum.* In 1830, botanist Meyer in the Transcaucasian eastern region, in the Talish Mountains, found a very beautiful lily with white, scented, turban-shaped flowers and bright red pollen. In 1889, it was published as *L. ledebourii.* In 1849, in NE Turkey, Lazestana, in the District of Rize near the Hamlet of Hemshina [ESE of the Black Sea], *L. ponticum* was found, boasting butter-yellow, bell-shaped flowers marked with brick-red punctuation in the centre. This lily was introduced by Koch.

Several articles about the Caucasian lilies were published by Misczenko in the first half of the twentieth century. In 1911 he introduced *L. artvinense* which had been found in the vicinity of Artvinska [ESE of the Black Sea, east of the District of Rize], and in 1941 he also wrote about *L. kesselringianum.* In 1942, Mandenova published her article 'Caucasian Lilies' — a systematic study of lilies in the Caucasus and their specific habitats.

In Russia, Nitschurin was the first who worked with Caucasian lilies. In 1914, he crossed *L. szovitsianum* with *L.* x *bulbiferum* and obtained a violet-scented hybrid. He named it 'Fialkovaja' — the violet. In 1936, Tvetayeva (a Manchurian collector) produced several hybrids which bore a slight scent of violet by crossing 'Fialkovaja' with *L. dauricum.* The most popular of these is the 'Dotch Failkovoy' (daughter of violet). In Latvia, P. Upitis has worked with Caucasian lilies. In the 1950s and 60s, he brought back from Caucasus plants of different species, including lilies. His crossings yielded strong-scented plants with bell-shaped flowers in various shades of yellow. His hybrids appear similar to *L. monadelphum*: bell-shaped, pendulous, strongly aromatic flowers of variations in yellow — straw, lemon, gold, egg yolk — with or without spotting in centers and yellow, orange or brown pollen. Upitis' hybrids are from 100-120 cm. in height, early bloomers (at the end of May or beginning of June) and producers of high-quality seeds. Latvian master grower Orekhov has also worked with Caucasian lilies. During his vis-

its to the Caucasus, he researched the growing conditions there and collected bulbs. By crossing *L. monadelphum* and *L. szovitsianum*, he developed 'Lelde' and 'Selga' with cream-white, bell-shaped flowers.

Caucasian lilies are not widely cultivated in either Russia or the Baltic area. Their propagation can be quite a task and some species, for example *L. kesselringianum*) do not develop either rootlets [bulblets] or bulblets on the stem [bulbils]. Propagation with scales may not be convenient either. In the fall, not all species can be propagated by scales (for example, 'Filakovaja, *L. monadelphum, L. kesselringianum* and *L. szovitsianum*). In September or October the outer scale bulblets start to develop, but the outer scales soon deteriorate and the inner scales develop only a few bulblets. Orekhov has suggested that by the fall the outer scales are too old for the purpose. The later in the season, the less chance of success, but if the scales are obtained while the plants are still in bloom or right thereafter, bulblets develop well.

Because of delayed hypogeal germination (the seeds under the ground are to pass through various stages in changing temperatures), propagation with seeds is time-consuming. It takes some six or seven years before the new seedlings come into bloom.

In order to grow Caucasian lilies, conditions of their native habitat (part sun/part shade) must be established. The upper parts of the plants can be in full sun, but their roots must be under a shady cover, and the soil must never be exposed to the sun. These lilies are calciphilous (lime-loving) plants and should be grown in soils containing PH-7. Moist and peaty soils are not suitable. The bulbs should be planted about 10 cm. deep, and the ground should drain well. After transplanting, Caucasian lilies take their time — some two years — before the bulbs establish a new root system and the plants come into bloom. Spring transplants die out. Transplanting can be done only once a year — in August or the beginning of September. If well looked after, a plant may stay in the same spot for five or more years.

CAUCASIAN LILIES IN LATVIA

1. *L. kesselringianum* blooms the end of May/early June, earlier than other Caucasian species. The pendulous, wide, bell-shaped, strongly-scented flowers are straw yellow or cream yellow with small reddish or purple spots in the centers, brown anthers and light

orange pollen. The petals are narrower and finer than petals of *L. szovitsianum* — this being one of the main differences between the two species. Bulbs are larger and heavier than bulbs of any other species. A bulb — broadly ovoid with ovate yellowish scales — can weigh up to two kg. and contain about a hundred scales. Up to 160 cm. in height, the stem is covered with thick foliage. Bulblets do not form at the base. *L. kesselringianum*, regardless of habitat, remains constant in shape, color, petal formation, color of pollen, fragrance and height — all of which is not characteristic of most other Caucasian species. In its natural habitat, *L. kesselringianum* is not as abundant as *L. monadelphum*. It is not frequently utilized by breeders.

2. *L. szovitsianum* blooms at the beginning of June. The pendulous, trumpet-bell shaped or trumpet-turban shaped flowers are sulphur yellow with fine, red-brown markings around the edges of the petals, the bases and tips of which are purple. The stamens are bright orange-red with orange (cinnabar) pollen and an unpleasantly sweet scent. Two main features of the species may be noted: a) the bright orange pollen turns to brown later in the season and b) the petals are thicker and larger than petals of any other Caucasian species. In its natural habitat, color variations depend on growing areas: lighter or darker yellow with pollen of light or dark orange, but always bright — another notable feature of the species. The flowers may also be plain with no punctuation or marking. Stems are up to 150 cm. high — not as rich in foliage or as tall as *L. kesselringianum*, and seeds are ripe by the end of August. Bulbs keep well and cultivation is rather easy. The species thrives in both light and heavy soils and has been used by growers for hybridization.

3) *L. monadelphum* is the most widely cultivated Caucasian species in the Baltic area. It blooms in early June. The pendulous, bell-shaped flowers with short pedicels, semi-recurved petals (purple at the base on the outside, curled at the centers and pointed at the tips) are golden-yellow to deep clear yellow with finely dispersed dark red markings, yellow pollen (distinct from the orange of *L. szovitsianum*) and a green stigma. The filaments are frequently (but not always) united by being fused into a tube at their bases — a feature that gave the species its name. Stems are up to 150 cm. in height and seeds are ripe at the end of August. *L. monadelphum* is more

susceptible to changes in soil, moisture, heat and cold than any other Caucasian lilies. Changes are noted in the color of pollen and the sizes of both petals and the stigma — all of which seem to depend on the height of the stem. In their natural habitat, *L. monadelphum* occupies larger areas than any other Caucasian species. It is hardy, easy to cultivate and utilized by hybridizers. In the wild, there is found *L. monadelphum* var. *armenum* with yellow-gold flowers, narrow, curved petals and dark yellow or orange pollen. The published data seems to vary as to the origin of this variety. Some say the Armenian Lily is a variation of *L. szovitsianum*, others of *L. monadelphum.* The Russian authority Baranova thinks that var. *armenum* is more closely related to *L. monadelphum* than to *L. szovitsianum. L. monadelphum* var. *armenum* has not been much used in hybridization.

4) *L. ledebourii* blooms at the end of June and is considered one of the most exotic of the Caucasian species. Its natural habitat appears to be rather limited and it is not widely cultivated. The flowers are green-white with fine, dark red-purple markings and bright red-orange pollen. There are two (seldom one or three) blooms per stem — vanilla scented, a fragrance more pleasant than that of any other Caucasian species. Stems grow up to 120 cm. in height. They are rich in foliage but bare for about 5-6 cm. to the top. In Latvia, seeds are ripe at the end of August, but this species is seldom used by hybridizers.

Early-blooming, hardy and unique though they are, there is not enough known about the Caucasian lilies. What has been published about their natural habitats, their main species and varieties is inconsistent. As their outer features suggest, *L. monadelphum* may be the main species and *L. ponticum* and *L. szovitsianum* their varieties. Even the classification seems to be incomplete. The Caucasian species provide a wide field for research, and the most exciting place to start should be their native habitats — the ecosystems that have created these rare splendors of nature.

Lilium ledebourii

M. V. Baranova. Russia. *Lilies.* 1990
Translation by Andris Krumins with modifications in the translation by Julius Wadekamper

Plant 50-100 cm. high. Stalk green, slightly ribbed, stem rooted at underground part. Numerous linear-lanceolate leaves diminishing in size at upper part of stalk, minutely ciliated at the margin, smooth beneath, average leaves 8.0-8.5 cm. long and 1.0-1.3 cm. broad. Flowers white, very fragrant. Perianth Turks' cap, 5-6 cm. across, the segments are lanceolate 7-8.5 cm. long and 1.5-1.8 cm. broad, tiny streaks of brown toward the margin, at the base green open nectaries.

The pollen is bright scarlet with a green round-shaped stigma. It flowers in June-July. Fruit: upside down egg-shaped, pressed capsule. Bulb egg-shaped slightly asymmetrical 4.5-7.0 cm. across with numerous (up to 40) white or yellowish narrow lanceolate scales.

Until quite recently a habitat of this species was considered to be confined to mountainous woods of Talysh [The Talish Mountains are west of the Caspian sea in Iran. See map on page 4] where it grows at 900-1500 m. above sea level under a shelter of broad-leafed deciduous woods, but in 1972 it was found in Iran on the Elburz Mountain [south of the Caspian Sea in Iran. See map, p. 4] in a small area at 1600 m. among shrubs of barberry and hawthorn. Norwegian botanist P. Vendelbo found three sites of this lily on the Elburz Mountain. There are a few distinctions between the Caucasian and Iranian lilies. The Iranian lilies have more blooms (4-10 rather than 1-5 for the Caucasians). Their horizontally straightened pedicels are longer and brownish with a green receptacle, and they grow at a higher altitude (1700-1900 m. above sea level).

L. ledebourii was collected for the first time on Talysh Mountain by K. A. Meyer in 1830, described by K. F. Ledebour as *L. pyrenaicum* and under that name was inserted in his fourth volume of *Flora Rossica.* In 1884 the Swiss botanist Boissier, revisiting Meyer's Caucasium collection, identified it as a new species and named it *L. ledebourii* in honor of the Estonian Professor of Botany, K. F. Ledebour (1785-1851).

This lily has been known in Europe since 1874, but because of the difficulties in cultivation it has very rarely been seen in collections. Due to its rather good hardiness and ability to reproduce by seeds and scales, it deserves more attention and to be investigated for reintroduction.

Exceptional beauty and restricted small habitat stimulated intense, often savage collection which brought it to the brink of extinction. At the moment, *L. ledebourii* is in the Red Data Book (rare and endangered species of animals and plants) of the USSR and is protected together with other rare and endangered plants in its habitat.

[Additional notes by Andris Krumins]:
L. ledebourii has grown in the National Botanical Garden of Latvia since 1987 without any protective covering in winter. It performs quite well, produces seeds and multiplies by producing additional stalks. This happens as far north as the 57th parallel.

[From *Lilies of the World* by Carl Feldmaier. 1970.]
Found from the Talysh of eastern Caucasus to the Iranian border. Grows in mountainous terrain and wood clearings at elevations of 3,000-4,500 feet. Perhaps a relic of European lilies, as *L. pyrenaicum* is considered to be its nearest related variety.

Broad, ovoid bulbs of 2-2 ½ inches, with white scales. Stem 3-4 feet high with narrow to broad, small, linear leaves, each with three to five veins. One to three vanilla-scented, May/June-blooming, Turks' cap flowers 2-2½ inches in diameter, pale-green

to yellow-white with dark purple spots on the lower half of the petal margins. Orange pollen, self-pollinating, seeds ripen July/ August, slow germination. A cross with *L. candidum* may be possible. (RHS-LYB 1966, Saliwski)

[From *Lilies of the World* By Woodcock & Stearn]
This little known Martagon [sic] lily inhabits the Talysh district of eastern Caucasus, growing there in mountain woods, and, although regarded by Baker as a variety of *L. monadelphum,* seems more closely related to *L. pyrenaicum.* The glabrous three feet high stem is densely leafy with numerous, scattered, very slender and rather erect, linear leaves, smooth beneath and hairy only at the margin; it bears one to three nodding turkscap flowers of pale greenish yellow red-spotted within, with closely revolute segments about 2½ in. (6 cm.) long; the anthers are yellow. According to Baker this was once cultivated at Kew. It probably requires the same treatment as *L. monadelphum* or *L. pyrenaicum.* The name commemorates Karl Friedrich Ledebour (18-785-1851), Professor at Dorp at in Estonia from 1811 to 1836; cf. *J. Arnold Arb.* 22. 228 (1941).

[From *Lilies for American Gardens* by George Slate]
This Martagon lily is related to *L. pyrenaicum* and is found in the Talysh district of the eastern Caucasus where it grows in mountain woodland. The flowers are pale greenish yellow with red spots, and one or two in number. It is probably not in cultivation at the moment.

This edition of the SLPG Newsletter
is dedicated to the victims of
September 11th .
May they forever walk in fields of lilies.

Bulb Sale Report 2001

Edward A. McRae

A total of 29 lily species and varieties were offered for sale to members in the fall of 2001, and close to 80 orders were filled, 24 of which were outside the United States, the largest portion of these being from England

All species sold were grown directly from seed, the first growing season being in cool greenhouse beds, followed by one or two growing seasons in rows at Lava Nursery. Growing conditions were excellent in both greenhouse and field; this was reflected in overall bulb quality where no serious problems were observed.

The following Asiatic species and varieties continue to be reliable and dependable on an annual basis:

L. amabile
L. amabile var. *luteum*
L. callosum
L. cernuum
L. concolor (early)
L. concolor (late)
L. concolor var. *coridion*
L. dauricum
L. davidii
L. lancifolium (*L. tigrinum)*
L. lankongense
L. pumilum
L. pumilum 'Golden Gleam'
L. pumilum 'Yellow Bunting'
L. wilsonii

Many of these species produce large bulbs in their second season in the field. I sometimes prefer the smaller-sized bulbs produced in the second year — this is especially true of such species as *L. pumilum* and *L. cernuum. L. callosum* is an especially charming late-flowering species with tiny, waxy pendant flowers of rich red to orange coloring, carried on plants that averaged four feet in height. Seed, however, has been in short supply and sizeable populations have been difficult to establish. The yellow-flowered variety, *L. callosum* var. *flaviflorum,* is equally charming but also difficult to establish. I encourage members to become seed producers for the rarer species; *L. callosum* is highly fertile and would readily produce and ripen seed in the right locations.

The late-flowering form of *L. concolor* is truly exceptional.

Flowers are identical in size to earlier forms; however plants are much larger with great vigor. This form bloomed six weeks later than the early form at Lava Nursery and produced large, pyramidal flower heads in the third year. In 2001 we picked the buds at cluster stage, allowing only a few plants to flower. By this method we were able to produce large, plump bulbs of top quality. Those interested in hybridizing Asiatic lilies may be wise to consider this fine form of *L. concolor*. We visualize hybrids with smaller and more dainty flowers; this would be a welcome change from the large-flowered Asiatic hybrids presently being sold as cut flowers.

L. lancifolium (synonym *L. tigrinum*) received from Mr. Arakawa in Japan was excellent, producing vigorous plants carrying a bulbil in almost every leaf axil. *L. lancifolium* var. *flaviflorum* was equally strong; hopefully these diploid forms will encourage hybridizers to return to this vigorous species.

We now have a large planting of *L. canadense* var. *rubrum* at Lava Nursery which promises to be spectacular in 2002. The seedlings originated at Cebeco Lilies and we are indebted to Cebeco and especially Teresa Leap for acquiring such a large population. The seedlings were growing in trays in the spring of 2000 and looked excellent until an unfortunate rise in greenhouse temperatures in May burned off the foliage completely. The trays were examined in late August and were found to be full of tiny stolons with small daughter bulblets. These were carefully harvested in September, packed in sphagnum peat moss and stored in my garage until mid-February 2001. They were then moved to Lava Nursery along with other species seedlings. They were placed in the cold room at 30° F. until planted out in early May. They emerged in less than a week, although no sprouts were observed at planting time. The long dormancy (almost a year) must have had a special effect! Many of the plants produced single flowers in 2001, bulb growth was excellent and we look forward to a special show in 2002.

L. martagon, *L. martagon* var. *album* and *L. martagon dalmaticum* were also grown in trays at Cebeco Lilies and suffered the same fate as did *L. canadense* var. *rubrum.* I was heartbroken when the vast majority decided to produce flowering stems in late August and September, giving a wonderful display! We should have harvested the bulbs in late May or June and planted them outdoors. Cebeco Lilies completed their move to Holland in late September of 2000, and hosts of *L. martagon* bulbs were abandoned.

L. rubellum is the earliest species to flower at Lava Nursery, one week ahead of *L. pumilum* 'Yellow Bunting.' It was a delight to see such a large planting of this charming alpine lily in 2001. It is unfortunate that *L. rubellum* was planted next to the later flowering Oriental species *L. auratum* var. *platyphyllum* which blooms more than two months later. It would prefer much drier conditions following flowering and would be able to produce the strong basal root system which is typical of this species. The bulbs were healthy, just smaller due to the high moisture levels during summer.

The crop of 2002 will include those offered in 2001 with a number of additions:

L. bakerianum var. *delavayi* (Chen-Yi)
L. candidum var. *salonikae*
L. bukozanense
L. cernuum (Baranova)
L. concolor var. *buschianum* (Baranova)
L. davidii (sturdy form from Chen-Yi)
L. duchartrei
L. lancifolium var. *flaviflorum*
L. leichtlinii
L. longiflorum
L. nepalense
L. sargentiae (Chen-Yi)
L. surphureum (Chen-Yi)
L. wilsonii var. *flavum*

There may be a few surprise species offered at a high price due to short supply. In adjacent fields at Parkdale, we continue to grow two clones of *L. henryi*: 'Carlton Yerex' and *L. henryi* var. *citrinum.* Both are exceptionally strong and healthy and will be offered again in 2002.

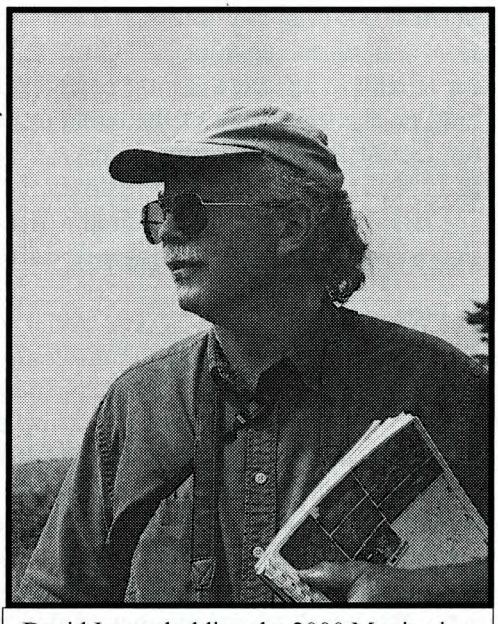
I deeply appreciate all who have helped in the lily species program. Much enthusiasm has been shown for the special beauty and charm only the species carry. Let us all do our best to see that some of this unique beauty is preserved.

Western Lily (*L. occidentale*)

By David K. Imper and Dr. J. O. Sawyer

[What it takes to preserve a lily]

[In 1987, David Imper, G.E. Hovey, J.O. Sawyer and S.A. Carlson prepared a Management Plan for the Table Bluff Ecological Reserve to protect *L. occidentale*. This was an interagency agreement between the California State University system and the California Department of Fish and Game. David Imper and J.O. Sawyer made annual monitoring reports in the years following.



David Imper holding the 2000 Monitoring Report: Western Lily
Photo by Barbara Small

In general, these reports address the impact of the growing spruce forest, cattle grazing, and threats (grazing by mammals, insect and slug depredation, disease and human use) as well as efforts to expand the population both at Table Bluff and other areas. This past summer, David Imper led a group from the Sacramento Sierra Lily Society (with guests from the Species Lily Preservation Group) on a tour of the Table Bluff reserve during which he explained the project to save *L. occidentale*. The following are excerpts from the 2000 report.]

General

A total of 620 flowering plants were mapped this year, a 32% increase over last year. More impressive, at least 271 additional plants were expected to flower, but were browsed by deer or other agents prior to the annual census, indicating the total potential flowering population is now nearly 900. ... The reserve population is rapidly approaching the threshold for recovery established in the USFWS final recovery plan for

the western lily ... which calls for a minimum of 1,000 flowering plants at 20 locations spread throughout the range.

The Northern Opening. The former small spruce opening ... has historically supported a large portion of the lilies on the reserve. Spruce limbs were removed in February 1988, causing an initial shock, and a positive but brief rise in lily vigor in 1990. Two spruce were removed from around the opening in February 1992, to help prepare the plants for extensive spruce thinning conducted later that year. Further thinning on the south side of the opening was conducted in 1994-95. The number of flowering plants increased rapidly, with 58 plants flowering in 1996, 63 in 1999, and surprisingly, 143 flowering this year [2000]. It appears that most plants required a five to six year developmental period following logging to trigger flowering. ...

The Southern opening. ... The initial population survey in 1987 indicated more than half of the entire population at the reserve existed in this remnant opening and the surrounding *Spruce forest*, consisting of virtually all seedlings less than six inches tall. The surrounding forest was thinned in winter 1989-90. The 1990 population census showed a decline in abundance and vigor of plants in the thinned area. Additional spruce were removed on the east side of the area in 1994-95. Soils monitoring conducted following the removal of spruce indicated a significant increase in temperature and decrease in soil moisture as a result. Nevertheless, the number of flowering plants has increased from only four in 1988, confined to the small opening, to 265 flowering plants this year scattered throughout the entire thinned area. This area accounted for 46% of the overall fruit yield this year. ...

The former main population. The third area assessed for response to management is the historical main population center at the west edge of the *Spruce forest.*

Cattle

For the fourth year in a row, the entire lily exclosure was opened to cattle use. However, instead of opening the exclosure for an extended period, the grazing lessee locked the entire herd (68 head) in the 35 acre exclosure for three days in February. Grazing impact appeared to be concentrated within the lily habitat, and noticeably reduced overall plant height and created pathways in several areas. The grazing appli-

cation probably would have been of greater benefit if it were of longer duration, perhaps a total of six or seven days. ...

All lilies present in 27 fixed plots were monitored repeatedly throughout the growing season, and were exposed to various intensities of cattle use (passive seasonal, short duration-high intensity, longer duration-low intensity), and exclosures designed to exclude small mammal and deer. The impact of cattle on soil compaction is also being quantified.

Population expansion project. The majority of population expansion site #1 was planted in 1992 [See map, page 19]. Approximately 700-800 seed and 47 lily bulbs grown at Humboldt State University greenhouse were planted in September and November 1992 ... . Expansion sites 2-4 were planted in January 1998 ... utilizing bulbs grown from seed at Freshwater Farms Nursery in Eureka ... . Finally, in January 1999, additional bulbs were outplanted by CNPS volunteers to expansion site #1. ...

Plant emergence and growth at all expansion sites were monitored on 6/14/00 ... . The four expansion colonies contained a total of 101 multi-leaved plants (four flowered; two more might have but were browsed) and 93 single leaf seedlings this year.

An additional population expansion seed site was initiated in spring 1995, located mid-way between the main population and expansion site #1 (Map 1). Excess seed collected in 1993 for use in an experimental project were planted along a 20' strip in open *Spruce forest*. More than 100 single-leaf seedlings ranging up to 1.5" tall were counted in 1996. However, only 12 seedlings were observed in June 1998, and 10 seedlings in 1999. This year, six single-leaf seedlings up to three inches tall, and five multi-leaved plants up to six inches tall were observed.

Other efforts that have indirectly expanded the population include fixed seed plots planted in conjunction with the Experimental Habitat Manipulation Project begun in October 1993 ... and seed plots planted in fall 1998 ... as part of the Vegetation Strategy Project. The approximately 1,800 seeds planted within the control, grazed, and mowed treatments in *Spruce forest* in 1993 yielded a total of 119 seedlings in 1996, some as tall as 6" (compared to virtually no survival in the Coastal prairie). At least 10 of those plants flowered this year, all located within

the *Spruce forest*. Seedlings originating from seed planted in 1998 were partially censused this year, as many as 27 one to two inch tall single-leaf seedlings were counted in the plots.

Discussion

The lily population as a whole appeared healthy, and individual plant development and reproductive effort were the highest recorded to date at the site. Human use, insect, small mammal browsing and disease were negligible. Loss to deer, and perhaps slug depredation caused an important, but tolerable decline in reproductive potential.

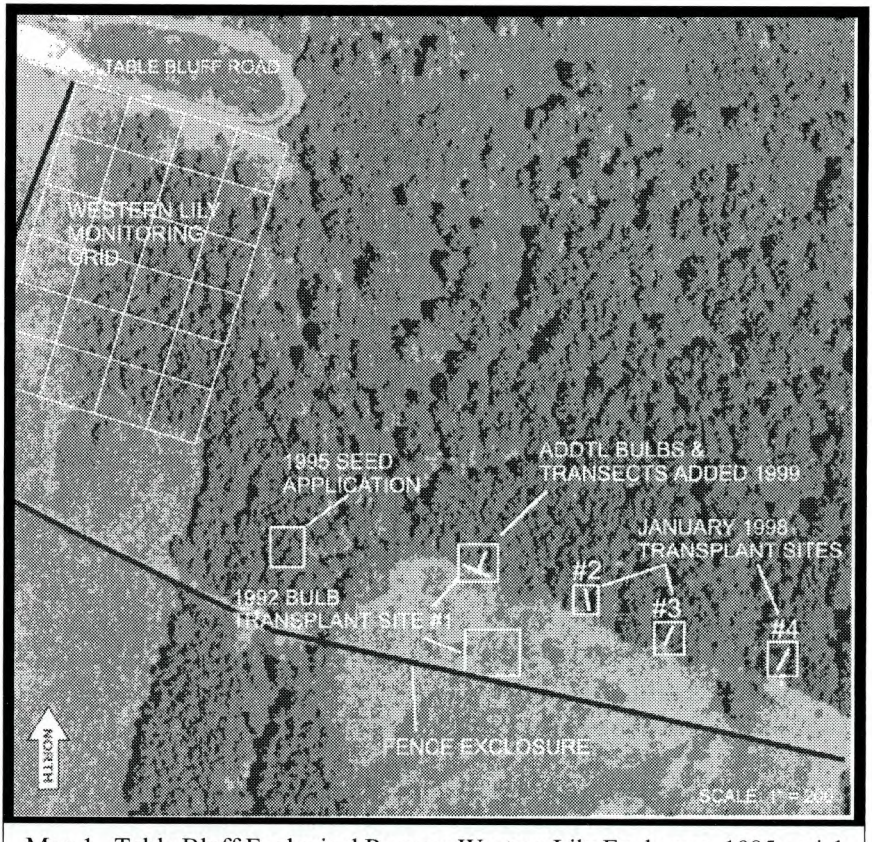
Vegetation structure and composition continue to change rapidly, underscoring the need for continuing vegetation management to maintain the existing western lily population. Resumption of passive cattle grazing and implementation of the Vegetation Strategy Project, involving an assessment of several controlled cattle grazing regimes over the next 5-10 years, has begun to restore the habitat to a more suitable condition.

It is more clear than ever that the spruce thinning combined with cattle exclusion in the late 1980s set in motion long term processes that are difficult to reverse, and may negatively impact the lily before adequate control mechanisms are in place. The encouragement of spruce reproduction, *Rubus discolor* and *R. ursinus,* appears to be relatively easily ameliorated through manual removal and reintroduction of cattle. However, the widespread establishment of *Rubus spectabilis* will require more intensive effort to restore the habitat. Manual creation of pathways over the past three winters has successfully encouraged cattle use in formerly impenetrable thickets. Continuation of manual treatment may be necessary until the proper grazing regime is determined, and an equilibrium in vegetation is achieved.

Further thinning of spruce in order to achieve the maintenance level called for in the reserve management plan (Imper *et al.* 1987) should be delayed until proven methods for vegetation management are implemented. Passive cattle grazing of the entire occupied habitat initiated in winter 1996-97 should be continued in conjunction with the Vegetation Strategy Project.

We recommend both the flowering census and a complete census of the

population expansion sites be continued on an annual basis. At the same time, a rudimentary assessment of human impacts, fence condition, grazing and other threats should be conducted. Inspection should be made of unoccupied habitat surrounding both the primary population and expansion sites to determine changes in overall population extent.



Map 1. Table Bluff Ecological Reserve Western Lily Exclosure, 1985 aerial photo from the 2000 Western Monitoring Report: Western Lily

Pitkin Marsh Lily

Ellen Davenport, Sebastopol, California

Pitkin Marsh Lily, *Lilium pardalinum* ssp. *pitkinense* is described in *The Flora of Sonoma County* as follows: Plants of wet habitats, rhizomatous, the scales mostly < 25 mm long, and jointed. Flowers nodding, bright orange-red with a light orange center, conspicuously spotted with large purple dots on the lower half, tepals strongly revolute to below the middle. Blooms June-July. Rare, marshy situations; < 400 ft.

The subspecies differs very slightly from its closest relative, *L. pardalinum* ssp. *pardalinum,* in two respects:

* ssp. *pardalinum* occurs in large clumps, tepals are 5-11 cm, and anthers are 10-17 mm.
* ssp. *pitkinense* occurs in small clumps, tepals are 3-9 cm, and anthers are 5-14 mm.

It is currently listed as endangered. The lily was first reported by Milo Baker in 1939 from Pitkin Marsh in Sonoma County, California. Other botanists reported findings at Pitkin Marsh in 1945, 1951, 1954, and 1981. Since 1981, however, the existence of the lily within Pitkin Marsh is in question. The current owners of the marsh have forbidden access to the property and the lilies are threatened by habitat loss, grazing competition, and collection. No one I've talked within the last three-four years can report on the status of the lilies at that site.

The good news is that the lily is flourishing at Cunningham Marsh, also in Sonoma County. First reported at this site by Milo Baker in 1946, subsequent reportings by other botanists in 1961, 1974, 1977, and 1987 confirmed the existence of a small population.

In 1998, the Cunningham Marsh Conservation Easement was established to protect marsh habitat and uplands from a proposed subdivision development on adjacent land. Under the easement agreement, the California Department of Fish and Game has jurisdiction over preservation of the 19-acre site. Since 1998, the California Native Plant Society-Milo Baker Chapter has maintained and monitored the easement area and has installed fencing around all lily populations—to identify the location of the plants when dormant and prevent grazing by deer.

In June, 2000 Milo Baker Chapter volunteers conducted a survey of the eight groups of lilies at Cunningham Marsh and counted 201 plants, with 397 stalks and 602 flowers. We will count the population again in the summer of 2002.

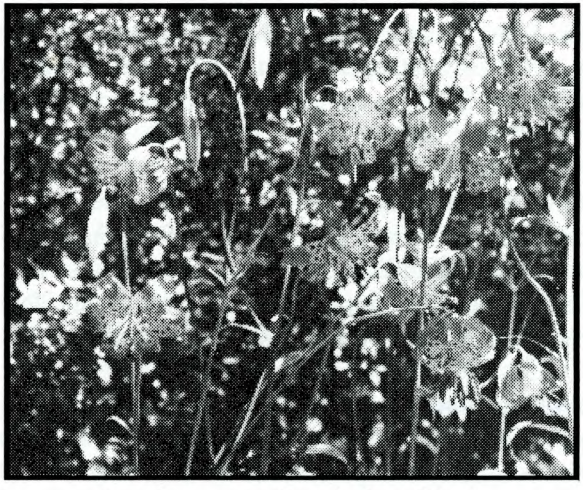
Stewardship of the site mainly involves removal of Himalayan blackberry and other invasive non-native plants from near and within the fenced populations. In addition, new clones are fenced as soon as they are discovered (two new populations currently) and fences are expanded as the colonies move out into surrounding areas.

The population at Cunningham Marsh appears to be the only remaining natural population of *L. pitkinense*. However, cultivated scale divisions of the lily are available through at least two Northern California nurseries.

A management plan for the entire marsh easement is being developed by Department of Fish and Game. The plan should include the following:

* Continued weed removal and rare plant monitoring.
* Continued maintenance of fencing to exclude livestock and vehicles.
* Repair of livestock-degraded riparian corridor that provides needed water to the marsh well into the summer.
* Educational materials to be distributed to potential property owners in the new subdivision. The materials will explain the importance of wetland habitats in general and the specific set-aside at Cunningham Marsh. They will also identify the types of activities that are not allowed in the area, e.g., woodcutting, trash or yard waste dumping, plant collecting, burning.
* Habit restoration to include replanting of indigenous riparian plants that are now absent or scarce.

Sonoma County, California, has experienced serious development pressures in the last few years, fueled by the local computer industry and new vineyard plantings. Continued vigilance will be necessary to ensure the survival of the last-remaining population of this lovely plant.



L. pitkinense at Cunningham Marsh
Note the tall, arched pedicils.
Photo by Roger Sherron

L. pitkinense: News from Sonoma County

A 53-acre subdivision on Lone Pine, Road [Cunningham Estates], first approved two years ago, is again being disputed by neighbors who fear that a marsh containing a rare and endangered plant [*L. pitkinense*] will be harmed by the development. ...

State Fish & Game officials say that the development will have an effect on the water table, but that should be offset by increased irrigation and runoff. "We are concerned, however, for overall water draw-down within the main marsh if development continues in the area," said Brian Hunter, regional manager with the Department of Fish& Game, in a letter to county planners. ...

[The preceding is from 'Neighbors want more protection for Marsh.' by Barry W. Dugan. *Sonoma West Times & News.* June 17-23, 1998. Kind permission for reprinting by Publisher Rollie Atkinson. The outcome of the meetings were the 19-acre preserve in Cunningham Marsh.]

[Dawn Pillsbury, Sonoma West Staff Writer sent the following update on further possible development in the Cunningham Marsh.]

The county has put off making a decision on the proposed 150,000 case-a-year winery on Vine Hill Road. Some 30 residents of the south Forestville neighborhood showed up to voice concerns about traffic and water at the Aug. 23 board of Zoning Adjustments hearing for Sonoma-Cutrer's winery application for 2625 Vine Hill Road. ...

Local wetland expert Betty Gaggolz testified that development in the area has already shrunk Pitkin Marsh, which is host to three federally protected species, including the Pitkin marsh lily. "The headwaters of several tributaries to Pitkin Creek are located on Sonoma-Cutrer lands," she said. "I would be very concerned to see any of them used for wastewater disposal.

She, as well as several other residents, voiced concerns that the hydrological study used in the winery's application were conducted in 1975 and does not reflect much of the area's water-intensive housing and agricultural development.

To allay neighbors' water concerns, [Cutrer's planning consultant] Aspinal revealed that the vineyard has been using Water Agency water from the Cotati Intertie which runs through the middle of the vineyard. Additional water for the winery — some 1.8 million gallons every crush — would still come from groundwater.

The board continued the hearing to 4 p.m. on Sept. 6 so the company's representatives could have a chance to rebut the testimony.

At that Sept. 6 meeting, the BZA [Board of Zoning Adjustment] continued the matter to Nov. [2001] so the winery could give them more water and traffic impact studies.

Species Group Member wins NALS 2001 Best of Show

Woodruff Imberman, Winnetka IL

Many members of the Species Group have dealt with 200 pound browsing deer and have devised ingenious and sometimes successful methods to deal with them. But what do you do when the hungry critters include 1,000 pound moose wandering through your yard?

Species Group member Robert Richards must have a good answer, because the *L. superbum* he entered into the North American Lily Society Show in Hamilton, Ontario this past summer won the Isabella Preston Trophy for Best of the Show, the Sacramento-Sierra Lily Society Species Award for Best Species Lily of North American origin, and the Harold F. Comber Award for Best Species Lily. All with one stem!

Bob has over 500 flowering *L. superbum* scattered in native settings on over 15 acres. The open, sunny fields are natural, in keeping with the wild nature of species lilies, and interspersed with stands of shady deciduous trees

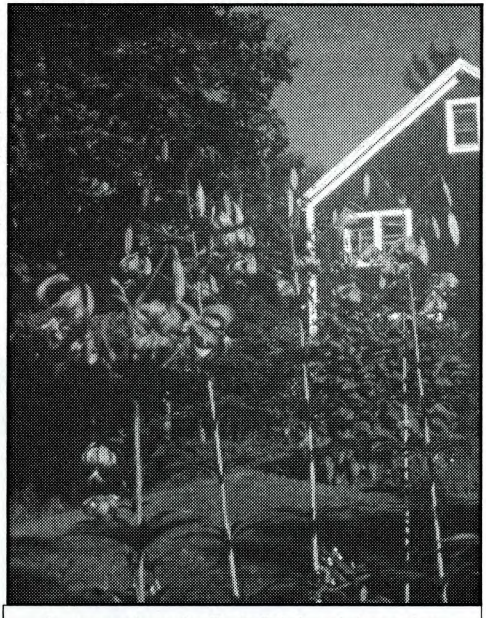
But why just *L. superbum* lilies, with a scattering of *L. canadense*? "Beauty is where you see it," said Bob, "and I like the form of those two lilies, since they stand out amongst the clumps of goldenrod, native grasses, wild asters, and occasional briar patches of native roses around here." The lilies sprout early, getting a quick spring start before the native grasses grow tall enough to smother them.

A botanist by training, Bob's interest lies in economic botany – growing native plants that do well in areas targeted for land restoration. He is associated with the Arnold Arboretum, from which he obtains and raises rare seeds of interesting plants and shrubs native to his area. The Arboretum is an arm of Harvard University and part of the Boston Park System. "Eventually, I would like to think of a commercial venture – growing and selling *L. superbums* (he already has a good start, with over 1,500 *superbum* seedlings growing in flats), and maybe *Rhododendrons, Viburnums*, and *Azaleas.*

"I like the openness of the fields, but I also like the forests, " Bob said, waving a cigar that he can only smoke outdoors . "It is nice to walk the fields at dusk, and see the lilies gradually fade from view as the shadows spread from the trees, enveloping all in night's darkness."

Is he dedicated? Well, how many Species Group members have named their daughter Lilium? She is a healthy 12 year old, interested in soccer, and Tim, his 16-year old son, is a starting forward on his high school's varsity soccer team, and a high honor student.

And as for keeping the moose at a distance, well, Sammy and Petey's night time canine patrols — and perhaps Bob's cigars — seem to do the job.



L. superbum in Bob Richards' garden
Photo by
Woodruff Imberman

Membership Information

Canadian dues $9.00 per year, 3 years for $25.00. United States dues $7.00 per year, 3 years for $20.00. Memberships may be renewed by contacting our membership chairperson

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Good News for *L. humboldtii*

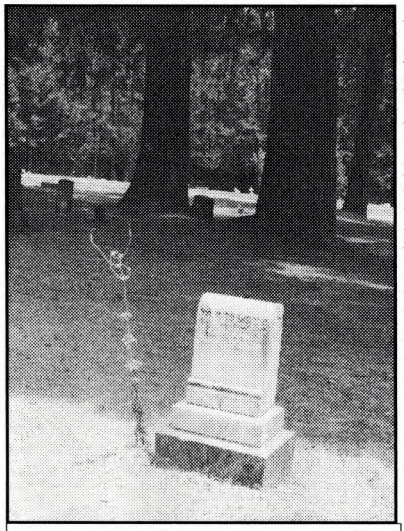
June Taylor, Biggs, CA

Shortly after returning home from the North American Lily Society meeting and show in Hamilton in July, 2001, I drove through ripening rice fields and fertile farm country of the northern California central valley into the foothills to check on the beautiful *L. humboldtii* that grow in the Brownsville District Cemetery. Brownsville was observing its Mountain Fair Day, and there were more people and cars in town than I have ever seen in the area. I have been going there since July 1986, either by myself or with friends, and over those 15 years I have noticed how much these beautiful natives have declined.

L. humboldtii around the Brownsville cemetery perimeter in 1986

That first year, lilies were growing around the perimeter of the original part of the cemetery and at least six to eight stems also grew close to most of the headstones. Those tall, colorful flowers were breathtaking in the July sunshine. Later in the year, we returned to look for seeds, but we observed the stems had all been cut while green and were stacked like cordwood in a cart! No seeds.

When Barbara Small and Mirna Hard from the Sacramento Sierra Lily Society visited the cemetery with me in 1995, we noted no lilies around the cemetery perimeter. Those few lilies left were close to the headstones and in the center of the cemetery. At first I thought the recently installed automatic sprinkling system might be at fault since *L. humboldtii* prefer little water in the summer. Someone else suggested deer were eating them.

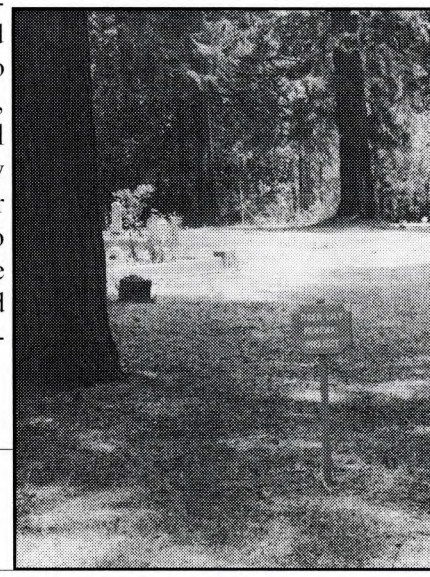


One lone *L. humboldtii,* 2001
May it rest in peace.

When I did my lily check in July this year, I was sorry to observe just a few brown stems close to the headstones, but I was heartened to see a sign that read "Tiger Lily Renewal Project." I had to know what was going on, so I phoned the cemetery board and learned that the former grounds keeper had gone to the cemetery board in 1996 and complained that it was a nuisance to have to trim around the lilies. He received permission to cut them down right after bloom. It seems that no one knew the stems were important to the maturing of the lily bulbs.

Now there is a new cemetery board, a new grounds keeper and a group from Brownsville that is working with the new board to restore the lily population. They have collected seeds to grow new lilies, have set aside a work day each month and are serious about once again having those "tiger lilies" bloom in the cemetery.

As we concluded our phone conversation, I mentioned to a board member that *L. humboldtii* also grows along the road to Challenge, a small town farther up the hill from Brownsville, where they might find more seeds for their project. I am looking forward to next spring to observe whether the lily seeds have found the soil and location set aside for them hospitable for their renewal.



Brownsville Cemetery (right)
The sign says "Tiger Lily Renewal Project."

L. pitkinense
Cunningham Marsh
California
Photo by Penny Parker

L. ledebourii
Azerbaijan
Photo courtesy of
Robin Miller

L. polyphyllum
Afghanistan
Photo by Harris Howland

L. carniolicum
Central Europe
Photo by Edward A. McRae