Purple Loosestrife

Lythrum salicaria L.

Loosestrife Family (Lythraceae)

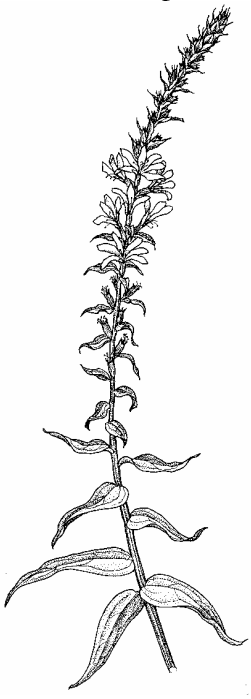
DESCRIPTION

Purple loosestrife is a stout, erect, perennial herb with a strongly developed taproot that grows in swamps, marshes, along riverbanks, and other wet, open areas. It is conspicuous from late June through September when the tall spikes of magenta-purple flowers are present. The plant ranges in height from 2 to 6 feet and from a distance, purple loosestrife may be confused with several other tall, native herbs with long red or purple spike-like inflorescences. Up close, however, it is easily distinguished from native plants.

Stem - The four-angled stem can be glabrous to pubescent and rises from a semi-woody base. The perennial roots of purple loosestrife form a dense mass that can produce as many as 30-50 stems annually.

Leaves - The simple, narrow to narrowly oblong leaves occur either in pairs (opposite) or a whorled configuration along the stems. Each 1-4" long leaf has a smooth edge and heart-shaped base that clasps the stem. The closest similar species is winged loosestrife (*Lythrum alatum*), a rare native plant that can be distinguished by its alternate leaf arrangement, except for those lowest on the plant.

Flowers- The magenta-purple flowers have 5-7 petals and are borne on narrow, upright spikes, 4–20 inches tall. Occasionally flowers will be white or light pink. The flowers open in July and continue to bloom through September or October.



Fruit - The fruit is a capsule generally containing 100 or more, tiny, dark colored seeds. Seed capsules remain on the plants through the winter, disseminating seed on a continual basis.

DISTRIBUTION AND HABITAT

Purple loosestrife is native to a wide geographic area across Eurasia and was first reported on the coast of northeastern North America in 1814. By 1830 purple loosestrife was well established along the New England seaboard. Although purple loosestrife occurs in every continental US state except Florida, the heaviest concentrations are in the glaciated wetlands of the northeast. Purple loosestrife is found in wetlands such as cat-tail marshes, sedge meadows, and open bogs. It also occurs along streams, riverbanks, and lakeshores. It is opportunistic in areas that have received recent soil disturbance and it is not uncommon to find it growing in manmade storm water retention ponds and in ditches adjacent to parking lots and roads.

Purple loosestrife grows best in high organic soils, but tolerates a wide range of conditions including clay, sand, muck, and silt. Generally, the plant is found in full sun, but it can survive in partial shade. Infestations of purple loosestrife appear to follow a pattern of establishment, maintenance at low

numbers, and then dramatic population increases when conditions are optimal. It flourishes in wetland habitats that have been disturbed or degraded by draining, natural draw down in dry years, bulldozing, siltation, shore manipulation, livestock trampling, or dredging. Mudflats exposed at low water levels will quickly be colonized if a loosestrife seed source is present.

REPRODUCTION AND METHODS OF DISPERSAL

Its prolific seed production, up to 2.7 million per plant per year, enables purple loosestrife to establish dense stands within a few years. Purple loosestrife spreads by seeds that may be distributed by water, by wind over ice in the winter, or by clinging to the feet of waterfowl. These seeds can remain viable 10-15 years and once germinated can reach sexual maturity in 8-10 weeks, thus flowering in their growing season. High seed viability (up to 99% in the first year) and prolific seed production can build up a seed bank of massive proportions. It can also spread vegetatively by formation of adventitious shoots and roots from clipped, trampled, or buried stems. These rhizomes can grow as much as one foot per year.

EFFECTS OF INVASION

An invasion of purple loosestrife leads to a loss of plant and wildlife diversity by affecting biogeochemical and hydrological processes in wetlands. Seeds are usually present in large numbers and germinate in such high densities that growth of native seedlings is prevented by what quickly develops into a monoculture of purple loosestrife and dominating the wetland environment. The build up of other debris around the roots enables loosestrife to invade deeper water and to form dense stands that shade out and push out floating vegetation by closing open water spaces. The impact of purple loosestrife is seen in the loss of native flora and fauna in affected wetlands, degradation of wetland pastures and wild hay meadows, clogging of irrigation systems, and the loss of natural habitat for recreational enjoyment.

CONTROL

Several control methods have been attempted with varying degrees of success, but current methods for eradicating large, dense populations of loosestrife are not totally effective. Natural area managers must determine their objectives first. Smaller populations can be generally be eradicated. Populations up to three acres can be cleared with herbicides or hand-pulled, depending upon the size of the work crew and time available. Large populations, exceeding the 3 acre size will be difficult, if not impossible, to completely eradicate using presently known methods. The boundaries of large populations should be contained at their present position through perimeter treatments. Preventing any further expansion can be accomplished by hand-pulling new plants along the periphery or spraying herbicide on plants extending beyond the main body of the population. As well, the use of biological control agents has proven to be successful in significantly reducing the volume of plant material allowing other species to regenerate in the wetland matrix.

Mechanical - Hand-removal is recommended for small populations and isolated stems. Ideally, the plants should be pulled out before they set seed in early fall. The entire rootstock must be removed since regeneration from root fragments is possible. Care must be taken to minimize disturbances to the soil and native plant cover. Uprooted plants and broken stems must be removed from the area since the broken stems can re-sprout.

Chemical - Glyphosate is most commonly used for purple loosestrife control. However, its non-selective action can cause native vegetation to die back leading to even greater explosions of loosestrife invading from the seed bank. Where possible, spot applications targeting loosestrife plants should ensure that no large holes appear in adjacent vegetation. The safest method of applying glyphosate herbicide is to cut off all stems at about 6 inches and then paint or drip a 20–30% solution onto the cut surfaces. Spraying should be done after the period of peak bloom, usually late August. It is critical that any control effort be followed up the same growing season and for several years afterwards since some plants will be missed, new seedlings may sprout from the extensive seed bank, and some plants might survive the treatment. For larger infestations where spot application of glyphosate is not practical, a 2,4-D broadleaf herbicide can be used. They have the advantage of not harming grasses and other grass-like species, which are the dominant plants in many wetland types.

Biological - Three host-specific insect species approved by USDA-APHIS have been released in the United States. These species are *Hylobius transversovittatus*, a root-mining weevil, *Galerucella calmariensis*, and *Galerucella pusilla*, two leaf-eating beetles, and *Nanophyes marmoratus*, a flower-feeding weevil. All four species have been successfully established in North America and are ccurrently available from various breeding operations. When these insects are present in high densities they cause defoliation of mature plants, death of seedlings, and the destruction of flowering spikes or prevention of their formation. Indications of successful introduction and control of purple loosestrife have been recorded at a number of release sites. On-going experiments have successfully demonstrated that certain loosestrife-eating insects can cause a reduction of as much as 95% of the biomass of purple loosestrife over a 3-5 year period. Although these beneficial insects do not completely eliminate purple loosestrife from a site, they can reduce and continue to suppress populations to more manageable and less harmful densities.

NATIVE ALTERNATIVES FOR LANDSCAPE USE

Purple loosestrife has long been used as a garden ornamental because of its attractive, long-lasting spikes of purple flowers. The claim is frequently made that horticultural cultivars do not produce viable seed and thus are not a threat to natural areas. However, it has been shown experimentally that garden forms of purple loosestrife do cross-pollinate with stands of the rare native species, winged loosestrife (*Lythrum alatum),* resulting in viable seed production.

Native alternatives to purple loosestrife for garden use include: Joe-pye-weed (*Eupatorium fistulosum, E. maculatum*), New England aster (*Aster novae-angliae*), purple-stemmed aster (*Aster puniceus*), New York ironweed (*Vernonia noveboracensis*), obedience-plant (*Physostegia virginiana*), bee-balm (*Monarda didyma*), hardhack (*Spiraea tomentosa*), swamp milkweed (*Asclepias incarnata*), blazing-star (*Liatris spicata*), great blue lobelia (*Lobelia siphilitica*), and cardinal flower (*Lobelia cardinalis*).

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