tall buttercup
Ranunculus acris L.

Synonyms: n/a
Common names: meadow buttercup
Family: Ranunculaceae

Invasiveness Rank: **60** The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Description

Tall buttercup is a biennial or short-lived perennial herb that grows up to 91 cm tall from clusters of fibrous roots. Stems are erect, smooth, hollow, leafy below, and branched above. Basal leaves are long-stalked, persistent, and divided deeply into 3 to 7 coarsely lobed segments. Stem and basal leaves are covered in soft hairs on both sides. Flowers are long-stalked with 5 shiny, golden-yellow petals and 5 sepals each. The sepals are shed early during flowering. Seeds are disc-shaped, reddish brown and have a prominent keel and a hooked beak at the tip (Welsh 1974, Douglas and Meindinger 1999, Royer and Dickinson 1999). Tall buttercup is listed as facultative wetland (FACW) plant in Alaska, which means it is usually a hydrophyte, growing best with its roots wet, but is occasionally found in uplands (Lichvar et al. 2014).

Similar species: Tall buttercup can be distinguished from other buttercup species by its upright growth habit and deeply divided, lobed leaves.

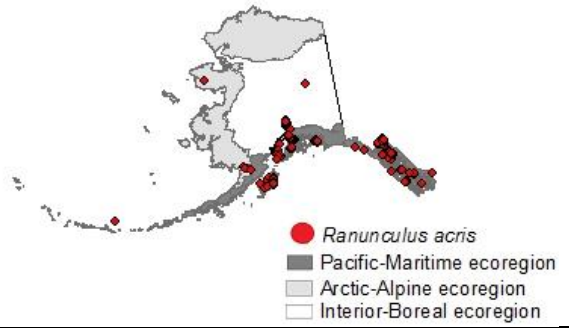
Tall buttercup (*Ranunculus acris* L.)

Distribution and Abundance

General information about distribution/range: Tall buttercup grows in grasslands, wet meadows, woodlands, and occasionally sand dune communities.

Native and current distribution: Tall buttercup is native to and widely distributed throughout Europe, where its range extends northward to 72° N in Norway (GBIF 2018). It has been introduced into North America, South Africa, Asia, and New Zealand (Hultén 1968, Harper 1957). Tall buttercup is considered a weed in the western U.S. (USDA, NRCS 2018). In Alaska, this species has been documented from all three ecogeographic regions (AKEPIC 2018). Climate change modeling and research on the expansion of tall buttercup predicts an overall decrease in global distribution range due to a decrease in suitable habitat in central Asia and the southeastern U.S.; the range expansion of tall buttercup into the northern limit for growth of the species also reduces potential expansion (Bourdôt et al. 2013).

AKEPIC database link and information regarding non-native plant species list is available online: http://accs.uaa.alaska.edu/invasive-species/non-native-plants



Distribution of tall buttercup (*Ranunculus acris* L.) in Alaska.

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Alaska Center for Conservation Science
University of Alaska Anchorage

Legal Listings

☐ Has not been declared noxious
☐ Listed noxious in Alaska
☒ Listed noxious by other states (MT)
☐ Federal noxious weed
☒ Listed noxious in Canada or other countries (QC)

Ecological Impact

Impact on community composition, structure, and interactions: Tall buttercup can inhabit native plant communities when those areas are disturbed, and is known to reduce perennial grass biomass and negatively affect forb cover (Jacobs et al. 2010, Strevey 2014). However, the growth and reproduction of tall buttercup is reduced under plant competition (Jacobs et al. 2010). Diverse vegetation can outcompete and suppress tall buttercup, likely due to its low stature, as the basal leaves are not capable of overtopping neighboring plants (Jacobs et al. 2010).

The poisonous compound protoanemonin is released in the sap of tall buttercup. Protoanemonin can kill grazing animals if ingested. Geese and other birds readily eat the leaves and seeds of buttercup (Lovett-Doust et al. 1990). The flowers are visited by honey bees, butterflies, moths, and beetles for pollen or nectar. Tall buttercup is known to host microorganisms, viruses, insects, and nematodes (Harper 1957, Royer and Dickinson 1999). Hybridization has been documented between *Ranunculus acris* and *R. uncinatus* (Welsh 1974). Tall buttercup may threaten local wetland and riparian habitat, reducing species composition and structure while increasing deleterious interactions with native plants.

Impact on ecosystem processes: Tall buttercup readily occupies open areas, moist meadows, hay pastures, roadsides and may hinder colonization by native species (Harper 1957).

Biology and Invasive Potential

Reproductive potential: Tall buttercup can reproduce sexually by seeds and vegetatively from stolons and rhizomes (Harper 1957). Tall buttercups are capable of producing up to 240 seeds per plant, however it typically has fewer than four flower per plant and may not flower every year (Sarukhan 1974). Tall buttercup does not generate a long-lived seed bank. Seed survival rate is generally less than two years, however seeds buried deeper than one inch can survive longer (Jacobs et al. 2010). Survival of seeds and regenerative rhizomes is increased in disturbed areas where native vegetation has been removed, but reduced in a species-rich plant community (Jacobs et al. 2010; USDA, NRCS 2010).

Role of disturbance in establishment: Seedlings establish readily on open ground and rapidly colonize bare areas in the year following germination (Harper 1957).

Potential for long-distance dispersal: Seeds have a short hook at the tip of the achene that helps them attached to animal fur for long-distance dispersal (Jacobs et al. 2010). Although most seeds drop near the parent plant, some seeds are transported farther away when blown by wind or dispersed in the dung of birds, farm animals, or small rodents (Harper 1957, Lovett-Doust et al. 1990).

Potential to be spread by human activity: Seeds can attach to clothing, shoes, farm equipment, or vehicle tires (USDA, NRCS 2010). Seeds can also be spread through contaminated hay (Jacobs et al. 2010). Garden varieties have been grown and escaped from gardens in Alaska (J. Riley – pers. obs.).

Germination requirements: Seeds usually germinate in late spring. Successful germination and early establishment appear to require open soil. Seedling survival is less than 1% and survival rate is increased if disturbance removes neighboring vegetation (Jacobs et al. 2010).

Growth requirements: Tall buttercup is adapted to a wide range of soil types and growth conditions. Because they can withstand waterlogged soils, tall buttercups growing in their native range are found in an intermediate elevation gradient in a zone that floods approximately 30 days per year (Jacobs et al. 2010) Tall buttercup grows mainly in damp meadows, but they can also thrive in sand or gravel if adequate moisture is present. (Harper 1957).

Congeneric weeds: Littleleaf buttercup (*Ranunculus abortivus*), corn buttercup (*R. arvensis*), St. Anthony's turnip (*R. bulbosus*), creeping buttercup (*Ranunculus repens*) and hairy buttercup (*R. sardous*) are invasive in some parts of the United States (USDA, NRCS 2018). Of these species, only creeping buttercup is known to occur in Alaska (AKEPIC 2018).

Management

Tall buttercup is host to insects in its native range that may contribute to its population regulation. However, at this time, there are no insects available as biological control agents in North America (Jacobs et al. 2010). Tall buttercup is host to the naturally occurring soil fungus, *Sclerotinia sclerotiorum*. A New Zealand study found one virulent isolate of *Sclerotinia* temporarily reduced tall buttercup total dry weight by 57 percent, suggesting this pathogen may reduce the invasiveness of this weed (Cornwallis et al 1999).

Herbicides are generally recommended for the control of buttercups, however the sublethal effects of herbicide application could affect agricultural biodiversity

(Bourdôt 2013). Plants can be weakened by cultivation, but they may regenerate from parts of the woody stem (caudex) and creeping horizontal plant stem (stolon), causing increases in the population. Plowing provides ideal conditions for the germination of seeds and is therefore not recommended as an eradication technique (Harper 1957, Lovett-Doust et al. 1990). Recent research of integrated weed management techniques that included herbicide and fertilizer application along with mowing did not improve tall buttercup control (Strevey & Mangold 2015). The growth and reproduction of tall buttercup is reduced under plant competition and notably suppressed when grown in diverse plant communities (Jacobs et al. 2010), suggesting that revegetation with native species may suppress growth of tall buttercup.

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