Chondrilla juncea L.

Rush skeletonweed

Family: Asteraceae
Range: Most western states; a few central, southern, and eastern states.
Habitat: Disturbed soils of roadsides, croplands (especially non-irrigated grain fields), semi-arid pastures, rangelands, and residential properties. Grows best on well-drained, sandy or gravelly soils in climates with cool winters and hot, relatively dry summers. Tolerates a wide variety of environmental conditions, including semiarid areas and cold winters. Less common on heavy clay soils.
Origin: Native to southern Europe.
Impacts: Invasive and competitive for water and nutrients. Persistent, wiry flower stems can interfere with harvest machinery.
Western states listed as Noxious Weed: Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, South Dakota, Washington
California Invasive Plant Council (Cal-IPC) Inventory: Moderate Invasiveness

Rush skeletonweed is an herbaceous biennial to perennial up to 3 ft tall with reddish basal leaves and milky sap. Its common name derives from its appearance at maturity, with wiry, branched stems with few or no stem leaves standing on a basal rosette. It forms a slender, deep, persistent taproot. Adventitious buds near the top of the taproot and on major lateral roots can generate new rosettes. Roots are easily fragmented, and pieces as small as 0.5 to 1 inch can produce new rosettes from a depth to 3 ft.

Plants exist as basal rosettes until maturity, when one or more stems develop. The upper stems are highly branched and nearly hairless, with few, greatly reduced leaves. The lower stems have dense, bristly, downward pointing hairs. Stems develop in late spring and flower until killed by frost in fall or winter. Flowerheads are yellow, like small dandelion heads, and grow on the sides or tips of stems, alone or in small clusters. Flowers are self-fertilizing, producing small pappus seeds that disperse primarily by wind. Seeds appear to survive less than 3 years. Rush skeletonweed can also reproduce vegetatively from root buds.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Because rush skeletonweed can resprout from root fragments, mechanical damage to established plants results in root sprouting and regrowth. Young seedlings may be controlled by cultivation. Frequent mowing may exhaust root storage, resulting in suppression.
Cultural	Under moist conditions, shallow burial of seed by hooves of grazing livestock appears to promote seed germination. In addition, moderate soil disturbance, such as grazing on a yearly basis, can increase populations by dispersing rootstocks. Continual grazing can reduce populations if seed germination is prevented. Burning is not effective against rush skeletonweed. Increasing nutrient levels on poor soils appears to discourage survival by increasing competition from other vegetation.
Biological	One of the most successful examples of classical biological control of weeds is the introduction of a rust fungus, *Puccinia chondrillina*, into Australia to control rush skeleton weed. *P. chondrillina* attacks one of three forms of the weed, the predominant type. Initially, as the population density of this susceptible type was reduced due to biocontrol, the two other types became more widespread. Therefore, additional rust strains virulent on these more resistant forms were introduced from the Mediterranean and these strains

	are exerting some degree of control of the resistant forms. As a result of this success, *P. chondrillina* was also introduced into the western United States to control rush skeleton weed. However, unlike in Australia, it has been only partially successful. As a result, the rust fungus is used along with two insect biocontrol agents, skeletonweed gall midge (*Cystiphora schmidtii*) and skeletonweed gall mite (*Aceria chondrillae*). All these agents are now widely established in the United States and appear to be reducing rush skeletonweed densities in California.

CHEMICAL CONTROL

The following specific use information is based on published papers and reports by researchers and land managers. Other trade names may be available, and other compounds also are labeled for this weed. Directions for use may vary between brands; see label before use. Herbicides are listed by mode of action and then alphabetically. The order of herbicide listing is not reflective of the order of efficacy or preference.

GROWTH REGULATORS	
2,4-D Several names	**Rate:** 2 qt product/acre (1.9 lb a.e./acre) **Timing:** Best applied postemergence at rosette stage. **Remarks:** 2,4-D is a broadleaf-selective herbicide with no soil activity. It is not the most effective treatment, but is widely used because of the low cost. 2,4-D will kill above-ground parts of the plant, but new rosettes will regenerate from the root system. This may require repeat applications. Do not apply the ester formulations when outside temperatures exceed 80°F. It can be used in a premix with triclopyr (*Crossbow*) at 4 qt product/acre.
Aminocyclopyrachlor + chlorsulfuron *Perspective*	**Rate:** 4.75 to 8 oz product/acre **Timing:** Postemergence in spring until flowering, or in fall to rosettes. **Remarks:** *Perspective* provides broad-spectrum control of many broadleaf species. Although generally safe to grasses, it may suppress or injure certain annual and perennial grass species. Do not treat in the root zone of desirable trees and shrubs. Do not apply more than 11 oz product/acre per year. At this high rate, cool-season grasses will be damaged, including bluebunch wheatgrass. Not yet labeled for grazing lands. Add an adjuvant to the spray solution. This product is not approved for use in California and some counties of Colorado (San Luis Valley).
Aminopyralid *Milestone*	**Rate:** 5 to 7 oz product/acre (1.25 to 1.75 oz ae/acre) **Timing:** In spring from rosette through flowering stage. In cold-winter climates, applications can be made in fall. **Remarks:** A broadleaf-selective herbicide with soil residual activity. Very safe on grasses. Longer residual and higher activity than clopyralid.
Aminopyralid + 2,4-D, *Forefront HL*; Aminopyralid + metsulfuron, *Opensight*; Aminopyralid + triclopyr, *Capstone*	**Rate:** 1.5 to 2.1 pt *Forefront HL*/acre; 2.5 to 3 oz *Opensight*/acre; 4 to 6 pt *Capstone*/acre **Timing:** Rosette to bolting stages. **Remarks:** Broadleaf-selective. Recommended rates based on those reported for similar species. *Opensight* is not registered for use in California.
Clopyralid *Transline*	**Rate:** 0.67 to 1 pt product/acre (4 to 6 oz a.e./acre) **Timing:** Postemergence to rosettes in fall, or up to bolting in spring. **Remarks:** Clopyralid is a broadleaf-selective herbicide like picloram, but more selective and with shorter soil residual activity. It is very safe on grasses. Clopyralid can be mixed with with 2,4-D (2 oz a.e./acre clopyralid + 8 oz a.e./acre 2,4-D) or dicamba (2 oz a.e./acre clopyralid + 3 oz a.e./acre dicamba).
Clopyralid + 2,4-D *Curtail*	**Rate:** 1.5 to 3 qt product/acre (use higher rate if plants are drought-stressed) **Timing:** Postemergence to rapidly growing plants from full rosette to early flower bud stage. **Remarks:** The combination is broadleaf-selective with a wide range of susceptible species. Another effective formulation is a premix of clopyralid with triclopyr (*Redeem*) at 2.5 to 4 pt product/acre.
Dicamba *Banvel*, *Clarity*	**Rate:** 2 to 4 lb product/acre (1 to 2 lb a.e./acre) **Timing:** Postemergence to rapidly growing plants.

	Remarks: Dicamba is a broadleaf-selective herbicide often combined with other active ingredients. It is also effective when tank-mixed with 2,4-D. Dicamba will kill above-ground parts of the plant, but new rosettes will regenerate from the root system. As result, it may require repeat applications. Do not apply when outside temperatures exceed 80°F. Dicamba is available mixed with diflufenzopyr in a formulation called *Overdrive*. The combination is broadleaf-selective, but safe on most grasses. This has been reported to be effective on rush skeletonweed. Diflufenzopyr is an auxin transport inhibitor which causes dicamba to accumulate in shoot and root meristems, increasing its activity. *Overdrive* is applied postemergence at 4 to 8 oz product/acre on rapidly growing plants. Higher rates should be used on large biennials or when treating perennial weeds. Add a non-ionic surfactant to the treatment solution at 0.25% v/v or a methylated seed oil at 1% v/v solution.
Picloram *Tordon 22K*	**Rate:** 2 to 4 pt product/acre (0.5 to 1 lb a.e./acre) **Timing:** Best applied postemergence to rosettes in fall or spring. **Remarks:** Picloram controls many species of broadleaf plants, but is relatively safe on established grasses. Some reports by applicators indicate that it may injure young or germinating grasses with fewer than 4 leaves. It is also effective when mixed with dicamba or 2,4-D. It has long soil residual activity. *Tordon 22K* is a federally restricted use pesticide. Not registered for use in California.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup*, *Accord XRT II*, and others	**Rate:** 2 to 4 pt product (*Roundup ProMax*)/acre (1.1 to 2.25 lb a.e./acre). Spot treatment: 1 to 2% v/v solution **Timing:** Apply to rapidly growing plants in bud stage. **Remarks:** Glyphosate is nonselective and has no soil activity. Repeat applications may be necessary. Effectiveness may be increased by addition of ammonium sulfate. Studies indicate variable results with glyphosate.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapyr *Arsenal*, *Habitat*, *Stalker*, *Chopper*, *Polaris*	**Rate:** 3 to 4 pt product/acre (0.75 to 1 lb a.e./acre) **Timing:** Preemergence or postemergence to rapidly growing plants. **Remarks:** Nonselective herbicide with fairly long soil residual activity.

RECOMMENDED CITATION: DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States*. Weed Research and Information Center, University of California. 544 pp.