Skagit Fisheries Enhancement Group
WEED CONTROL POLICY

GOAL:

Control invasive weeds species that can impede establishment and growth of native plants at riparian restoration sites in a manner that is cost effective and consistent with accepted ecological restoration methods. Minimize use of herbicides by utilizing non-chemical methods whenever is can be done practically and cost effectively.

WEEDS OF CONCERN

Washington State Class A weeds:

Washington State Class A weeds are those species where control is required when these species are found. SFEG will conduct an annual training session to teach SFEG staff and contractors to recognize all state Class A invasive weeds that could be present in our work areas. If encountered in the field SFEG will report Class A weeds to the landowner in writing, and will provide information on state control requirements and recommended methods. If approved by the landowner, SFEG will control these weeds using recommended methods, and will report infestations to the appropriate Cooperative Weed Management Area (CWMA).

Washington State and County Class B weeds required for control:

Washington State Class B weeds are those species where control is recommended by the state and/or recommended/required by the county noxious weed board. Current lists are provided as Appendix A to this policy, and are updated annually.

If encountered at a work site, SFEG staff will inform the landowner of the presences of Class B species and provide information on recommended means of control. State/County Class B weeds that are considered to threaten riparian restoration success include the following:

- Japanese Knotweed *(polyginum cuspidatum)*
- Giant Knotweed (*Polygonum sachalinense)*
- Himalayan Knotweed (*Polygonum polystachyum)*
- Policemans's Helmet *(Impatians gladulifera)*

Species are deemed to be a threat if they grow and/or spread fast enough to choke out trees before they attain a height sufficient to outcompete the trees. If the above species are identified within

SFEG restoration sites we will build costs to control them into all grants and/or contracts covering our work.

Washington State Class B weeds where control is required by the state and or Skagit County but that are NOT expected to interfere with successful riparian restoration include the following:

- Yellow Archangel (*Lamiastrum galeobdolon)*
- Scotch Broom *(Cytisus scoparius)*
- Tansey Ragwort *(Senecio jacobaea)*

If identified within a current or proposed project site, SFEG will inform the landowner of the presences of these species and provide information on recommended means of control. If infestations are small SFEG will treat during normal site maintenance in order to prevent these weeds from spreading. If requested by the landowner prior to securing funding and supported by the funding source SFEG may include costs for control of these species and assist with the work. The decision to accept additional invasive weed control work will be made by the Restoration Ecologist and/or SFEG Board, and will consider: a) the effect on our ability to accomplish other project related work; and b) consistency with SFEG's policy of minimizing herbicide use.

Washington State and County Class C weeds:

Class weeds are pervasive throughout the state and thus control is not required. However, the following Class C weeds are considered to be a threat to successful riparian restoration if they occur within restoration sites:

- Himalayan blackberry *(Rubus armeniacus)*
- Evergreen Blackberry *(Rubus laciniatus)*
- Morning glory *(Convolvulus arvensis)*
- English Ivy *(Hedera spp.)*
- Old Man's Beard/Travelers Joy *(Clematis vitalba)*
- Reed Canarygrass *(Phalaris arundinacea)*

Species are deemed to be a threat if they grow and/or spread fast enough to choke out trees before they attain a height sufficient to out compete the trees. The above class C weeds will be controlled as part of restoration site preparation and maintenance when they occur within restoration sites and are judged to have the potential to interfere with planting success.

SFEG will work with landowners to develop a site specific weed control plan prior to initiating restoration work. The plan will include recommendations for control over a ten-year period following planting. In general SFEG strives to secure funding to complete weed control for at least 3 years following planting. If possible we will work with landowner to secure additional funding beyond that point. However, funding for ongoing maintenance is NOT guaranteed, and landowners will be responsible for ongoing control following the end of grant projects according to applicable landowner agreements. If funding sources do NOT support control of these species, SFEG may elect to assist landowners with ongoing weed control **if** costs are paid by the landowner, and **if** work can be completed without interfering with required restoration work at other sites.

WEED CONTROL METHODS

A summary of weed species SFEG typically encounters, the 2018 list status, and typical treatment methods is provided in Appendix B. If practicable, manual weed control is SFEGs preferred method of treatment. Manual treatment techniques include the following:

Mowing

Mowing is the preferred method of weed control in abandoned pastures or farm fields where there is risk of infestation of weeds considered to be detrimental of surrounding farms, including thistle, tansy ragwort, and teasel. Mowing is general practicable only on relatively flat fields (i.e. slopes <5%) that are dry during the summer months. Mowing 2-3 times per year is effective at controlling the flowering and spread of certain annual and perennial weeds, and also helps reduce the risk of vole predation. Where mowing is identified as the preferred method of treatment, SFEG will install trees in rows that are spaced sufficiently wide to allow a riding lawnmower, skidsteer and/or small tractor to pass between rows both longitudinally and cross-wise. On smaller sites (<1/2 acre), or sites where terrain is not amenable to mechanized equipment mowing may be accomplished using weedwhackers. Mowing with weedwhackers is not considered practicable on sites larger than 5 acres.

If mowing is identified as the preferred method of control SFEG will request funding to complete two rounds of mowing per year, which will occur once in the spring (late April through early June) and once in the late summer (mid-July through September). If additional mowing is requested by the landowner SFEG may elect to assist with this work **if** costs are paid by the landowner, and **if** work can be completed without interfering with required restoration work at other sites.

SFEG recommends installation of plant protectors in these types of planting sites. Plant protectors protect native plants from both voles and from damage during site maintenance. SFEG will build in funding to remove plant protectors from plants in the final year of funded maintenance. If desired by the landowner SFEG may leave plant protectors on longer, but may not be able to remove them without additional costs to the landowner. It may be possible to engage volunteers to remove plant protectors after grant funded maintenance. Alternatively, SFEG staff can return to remove protectors if staff time, travel and disposal costs are paid for by the landowner.

Manual grubbing

Manual grubbing may be a practicable means of invasive weed control for Himalayan blackberry, morning glory, or clematis, provided infestations are small. Plants are removed by pulling roots by hand or digging them out with hand tools. Manual grubbing tends to be most effective if combined with an initial year or two of herbicide control. Manual grubbing will be conducted in the early spring, late fall or winter. Due to cost and staff time constraints, SFEG generally only utilizes this method on sites with small work areas (<0.5 acre) or limited/scattered infestations. SFEG may agree to utilize manual control on larger sites if the landowner is willing to participate, and/or a

volunteer group can be found to "adopt" the site and assist with control via at least two mid-week work parties per year.

Herbicide

SFEG strives to minimize the amount of herbicide used at our riparian restoration sites; however, on large sites, irregular terrain or with extensive infestations herbicide may be the only practicable approach. Steps taken to minimize the amount and possible impacts of products used include the following:

- Cut back tall weeds early in the season in order to stress plants and reduce leaf area. Treatment of lower growing vegetation also reduces the risk of overspray;
- Spot treatment is conducted using hand or backpack sprayers to ensure that products are applied only to target weeds;
- Treat only when winds are <10 mph and no rain is forecast for at least 8 hours to limit overspray, ensure effective translocation, and minimize the risk of rainwash.
- Do not treat weeds when pollinators or amphibians may be present
- Prepare and utilize site specific mixes that include surfactants/dyes that have been tested and are known to be safe.
- When possible inject or cut stems and paint rather than spraying.
- Work with landowners to make sure neighbors are notified prior to each application.
- Post public access sites with information including the date of treatment and product.

All SFEG herbicide treatment is conducted under the direction of a licensed Applicator according to Washington State laws and requirements. SFEG also obtains a NPDES permit annually for herbicide applications near water bodies. Field work is overseen by a licensed operator. SFEG's applicator and operators are required to have endorsements for aquatic, right of way, agricultural and ornamental work. Each licensed applicator/operator is required to complete at least 40 hours of training every 5 years in order to maintain a license in good standing.

In general SFEG's approach for extensive infestations is to conduct two years of site prep using herbicide. Thereafter manual weed control is the preferred method.

Where restoration sites are located adjacent to properties known to be used for organic farming SFEG will make every effort to meet with landowners to discuss herbicide use prior to initiating treatment. Regulations governing the certification of organic farms require that landowners ensure that there are 25-foot "buffers" between fields and areas where herbicide be used. While this is not the responsibility of neighboring properties SFEG will work with farmers and restoration property owners to ensure that sufficient buffers are identified and respected. No herbicide application is conducted when winds speeds are greater than 10mph. SFEG operator's record windspeed and direction on site prior to each application with a handheld anemometer; if wind directions are such that overspray could travel towards organic farms we will work on spraying in alternate areas.

Licensing and Permits

Herbicide is applied only under the supervision of a licensed applicator, with a licensed operator on site at all times during work. SFEG operators must have current endorsements for Aquatics, Right of Way, Agricultural (includes forestry), Turf &Ornamental. SFEG staff with licenses are required to complete annual continuing education credits in order to keep their licenses current.

Herbicide is applied in accordance with label guidelines designated by the Environmental Protection Agency. When applying herbicide within 10-feet of aquatic resources SFEG usesan appropriate herbicides for fish bearing streams. No herbicide application is conducted when rain is predicted within 6-hours or winds speeds are greater than 10mph.

Each year SFEG applies to be a "Limited Agent" for the Washington Department of Agriculture on their NPDES permit with the Washington Department of Ecology. This means SFEG reports annual herbicide usage to the WSDA which covers SFEG for herbicide application in areas near water. Herbicide data logs are recorded for each site daily and signed by a licensed operator. Paper records are kept for the requisite 7 years. SFEG also tracks herbicide use in a GIS database.

Posting& Notification

SFEG applies with all applicable laws regarding posting. On sites with the potential for public access, or where landowners request it SFEG installs signs at main access points during spraying activities. Information included on signs include: type of chemical used and concentration percentage, date applied and re-entry date, plus SFEG contact information for further inquiries.. While the law does not require it, SFEG posts formal recreation points (posted trailheads, boat launches, public parks, etc.) 48-hours to spraying activities, as well as after spraying. SFEG works with landowners to amend this policy if the landowner so desires.

Every year SFEG receives a list from Washington Department of Agriculture listing registered sensitive individuals. This list is cross referenced annually to see if any of these addresses are adjacent to herbicide treatment sites. If so alternative methods of weed control are prescribed.

Appendix A
2018 Skagit County Noxious Weed List

Classes of Noxious Weeds

Class A

Class A Noxious Weeds are non-native species whose distribution in Washington State is still limited.

- Eradicating existing infestations and preventing new infestations are the highest priority.

Eradication of all Class A plants is required by law.

Class B

Class B noxious weeds are nonnative species whose distribution is limited to portions of Washington State.

- Species are designated for control in state regions where they are not yet widespread. Prevention of new infestations in these areas is the primary goal.
- In regions where a Class B species is already abundant, control is decided at the local level. Containment of these weeds is the primary goal so that they do not spread into un-infested regions.
- **The Washington State Noxious Weed Board or a County Noxious Weed Board can designate a Class B noxious weed for mandatory control.**

Class B designations at the state level are listed in WAC 16-750-011 and are based on our designation region map.

Class C

Class C noxious weeds are either already widespread in Washington or are of special interest to the agricultural industry.

- The Class C status allows a county to enforce control if it is beneficial to that county (*for example*: to protect crops).

Other counties may choose to provide education or technical support for the removal or control of these weeds.

The Laws

RCW 17.10

RCW 17.10 (Revised Code of Washington) is the state's basic weed law.
The Washington Administrative Code (WAC) contains the rules and regulations needed to carry out state law.

WAC Chapter 16-750

WAC Chapter 16-750 includes the state Noxious Weed List, definitions and descriptions of region boundaries for Class B weeds, and the schedule of monetary penalties.

WAC Chapter 16-752

WAC Chapter 16-752 describes the quarantine list maintained by the state Department of Agriculture. (The state law that calls for the creation and maintenance of the quarantine list is RCW 17.24.)

Quarantine List

The Washington State Department of Agriculture (WSDA) maintains a quarantine list of plants, also called the prohibited plants list, whose sale or distribution is prohibited in the state. All Class A Noxious Weeds are on this list. There are also plants on the list to prevent them from being imported and spread in our state.

Skagit County Noxious Weed Control Board

1800 Continental Place
Mount Vernon, WA 98273
Phone: 360-416-1467
Fax: 360-770-2694
Webpage: https://www.skagitcounty.net/Departments/Noxiousweeds/main.htm

The Washington State Noxious Weed List is updated annually. Everyone is encouraged to participate in the process. For additional information, contact:

Washington State Noxious Weed Control Board
PO BOX 42560 Olympia, WA 98504-2560
(360) 902-2053
Website: www.nwcb.wa.gov

2018

SKAGIT COUNTY NOXIOUS WEED LIST

Region 2

List arranged alphabetically by: COMMON NAME

The following are Class A Weeds where control is required	
common crupina	*Crupina vulgaris*
cordgrass, common	*Spartina anglica*
cordgrass, dense-flowered	*Spartina densiflora*
cordgrass, saltmeadow	*Spartina patens*
cordgrass, smooth	*Spartina alterniflora*
dyer's woad	*Isatis tinctoria*
eggleaf spurge	*Euphorbia oblongata*
false brome	*Brachypodium sylvaticum*
floating primrose-willow	*Ludwigia peploides*
flowering rush	*Butomus umbellatus*
French broom	*Genista monspessulana*
garlic mustard	*Alliaria petiolata*
giant hogweed	*Heracleum mantegazzianum*
goatsrue	*Galega officinalis*
hydrilla	*Hydrilla verticillata*
Johnsongrass	*Sorghum halepense*
knapweed, bighead	*Centaurea macrocephala*
knapweed, Vochin	*Centaurea nigrescens*
kudzu	*Pueraria montana var. lobata*
meadow clary	*Salvia pratensis*
oriental clematis	*Clematis orientalis*
purple starthistle	*Centaurea calcitrapa*
reed sweetgrass	*Glyceria maxima*
ricefield bulrush	*Schoenoplectus mucronatus*
sage, clary	*Salvia sclarea*
sage, Mediterranean	*Salvia aethiopis*
silverleaf nightshade	*Solanum elaeagnifolium*
small-flowered jewelweed	*Impatiens parviflora*
Spanish broom	*Spartium junceum*
spurge flax	*Thymelaea passerina*
Syrian beancaper	*Zygophyllum fabago*
Texas blueweed	*Helianthus ciliaris*
thistle, Italian	*Carduus pycnocephalus*
thistle, milk	*Silybum marianum*
thistle, slenderflower	*Carduus tenuiflorus*
variable-leaf milfoil	*Myriophyllum heterophyllum*

The following are Class B-Designated Weeds where control is required	
blueweed	*Echium vulgare*
Brazilian elodea	*Egeria densa*
bugloss, annual	*Anchusa arvensis*
bugloss, common	*Anchusa officinalis*
camelthorn	*Alhagi maurorum*
common reed (nonnative genotypes only)	*Phragmites australis*
Dalmatian toadflax	*Linaria dalmatica ssp. dalmatica*
European coltsfoot	*Tussilago farfara*
fanwort	*Cabomba caroliniana*
gorse	*Ulex europaeus*
grass-leaved arrowhead	*Sagittaria graminea*
hairy willowherb	*Epilobium hirsutum*
hawkweed oxtongue	*Picris hieracioides*
hawkweed, orange	*Hieracium aurantiacum*
hawkweeds: All nonnative species and hybrids of the meadow subgenus	*Hieracium, subgenus Pilosella*
hoary alyssum	*Berteroa incana*
houndstongue	*Cynoglossum officinale*
indigobush	*Amorpha fruticosa*
knapweed, black	*Centaurea nigra*
knapweed, brown	*Centaurea jacea*
knapweed, diffuse	*Centaurea diffusa*
knapweed, meadow	*Centaurea x moncktonii*
knapweed, Russian	*Acroptilon repens*
knapweed, spotted	*Centaurea stoebe*
knotweed, giant	*Polygonum sachalinense*
knotweed, Himalayan	*Polygonum polystachyum*
kochia	*Kochia scoparia*
loosestrife, garden	*Lysimachia vulgaris*
Malta starthistle	*Centaurea melitensis*
parrotfeather	*Myriophyllum aquaticum*
perennial pepperweed	*Lepidium latifolium*
policeman's helmet	*Impatiens glandulifera*
puncturevine	*Tribulus terrestris*
rush skeletonweed	*Chondrilla juncea*
saltcedar	*Tamarix ramosissima*
shiny geranium	*Geranium lucidum*
spurge laurel	*Daphne laureola*
spurge, leafy	*Euphorbia esula*
spurge, myrtle	*Euphorbia myrsinites*
sulfur cinquefoil	*Potentilla recta*
thistle, musk	*Carduus nutans*
thistle, plumeless	*Carduus acanthoides*
thistle, Scotch	*Onopordum acanthium*
velvetleaf	*Abutilon theophrasti*
water primrose	*Ludwigia hexapetala*
white bryony	*Bryonia alba*
wild chervil	*Anthriscus sylvestris*
yellow archangel	*Lamiastrum galeobdolon*
yellow floatingheart	*Nymphoides peltata*
yellow starthistle	*Centaurea solstitialis*

The following are Class B Weeds where control is not required	
butterfly bush	*Buddleja davidii*
common fennel, (except bulbing fennel)	*Foeniculum vulgare (except F. vulgare var. azoricum)*
Eurasian watermilfoil	*Myriophyllum spicatum*
hawkweeds: All nonnative species and hybrids of the wall subgenus	*Hieracium, subgenus Hieracium*
herb-Robert	*Geranium robertianum*
knotweed, Bohemian	*Polygonum x bohemicum*
lesser celandine	*Ficaria verna*
loosestrife, purple	*Lythrum salicaria*
loosestrife, wand	*Lythrum virgatum*
Ravenna grass	*Saccharum ravennae*
Spurge flax	*Thymelaea passerina*

The following are Class B Weeds that are selected for control by the Skagit County Noxious Weed Control Board	
yellow nutsedge	*Cyperus esculentus*
knotweed, Japanese	*Polygonum cuspidatum*
poison hemlock	*Conium maculatum*
Scotch broom	*Cytisus scoparius*
tansy ragwort	*Senecio jacobaea*

The following are Class C Weeds that are selected for control by The Skagit County Noxious Weed Control Board	
common tansy	*Tanacetum vulgare*
common teasel	*Dipsacus fullonum*
field bindweed	*Convolvulus arvensis*
thistle, bull	*Cirsium vulgare*
thistle, Canada	*Cirsium arvense*
wild carrot (except where commercially grown)	*Daucus carota*

The following are Class C Weeds where control is not required	
absinth wormwood	*Artemisia absinthium*
Austrian fieldcress	*Rorippa austriaca*
babysbreath	*Gypsophila paniculata*
black henbane	*Hyoscyamus niger*
blackgrass	*Alopecurus myosuroides*
buffalobur	*Solanum rostratum*
cereal rye	*Secale cereale*
common barberry	*Berberis vulgaris*
common catsear	*Hypochaeris radicata*
common groundsel	*Senecio vulgaris*
common St. Johnswort	*Hypericum perforatum*
curlyleaf pondweed	*Potamogeton crispus*
English hawthorn	*Crataegus monogyna*
English ivy - four cultivars only	*Hedera helix 'Baltica', 'Pittsburgh', and 'Star'; H. hibernica 'Hibernica'*
Eurasian waterfilfoil hybrid	*Myriophyllum spicatum x M. sibiricum*
evergreen blackberry	*Rubus laciniatus*
fragrant waterlily	*Nymphaea odorata*
hairy whitetop	*Lepidium appelianum*
Himalayan blackberry	*Rubus armeniacus*
hoary cress	*Lepidium draba*
Italian arum	*Arum italicum*
Japanese eelgrass	*Zostera japonica*
jointed goatgrass	*Aegilops cylindrica*
jubata grass	*Cortaderia jubata*
lawnweed	*Soliva sessilis*
longspine sandbur	*Cenchrus longispinus*
medusahead	*Taeniatherum caput-medusae*
nonnative cattail species and hybrids	*Typha spp.*
old man's beard	*Clematis vitalba*
oxeye daisy	*Leucanthemum vulgare*
pampas grass	*Cortaderia selloana*
perennial sowthistle	*Sonchus arvensis ssp. arvensis*
reed canarygrass	*Phalaris arundinacea*
Russian olive	*Elaeagnus angustifolia*
scentless mayweed	*Matricaria perforata*
smoothseed alfalfa dodder	*Cuscuta approximata*
spikeweed	*Centromadia pungens.*
spiny cocklebur	*Xanthium spinosum*
spotted jewelweed	*Impatiens capensis*
Swainsonpea	*Sphaerophysa salsula*
tree-of-heaven	*Ailanthus altissima*
ventenata	*Ventenata dubia*
white cockle	*Silene latifolia ssp. alba*
yellowflag iris	*Iris pseudacorus*
yellow toadflax	*Linaria vulgaris*

Appendix B
SFEG Standard Treatment Approach

Species	Class	SFEG treatment method
Giant Knotweed *(Polygonum sachalinense)*	B required control (state)	Herbicide is the only effective method to control knotweeds. **Foliar treatment**- 1% Imazapyr mixture. Tall knotweed stems are bent below waist level in summer and herbicide is sprayed on leaves a couple of weeks later. The bending of stems causes less drift and is better for applicators since they are not spraying herbicide above their heads. **Injection**- it is also possible to inject knotweed stems utilizing special injector guns. Use a 100% glyphosate solution, but be aware of label limits on ounces per acre. This method works best in situations where they are other plants growing within the knotweed, since the possibility of drift is limited.
Himalayan Knotweed (Polygonum polystachyum)	B required control (state)	Herbicide is the only effective method to control knotweeds. **Foliar treatment**- 1% Imazapyr mixture. Himalayan knotweed generally only gets about 6 feet tall so stem bending is not necessary. **Injection**- it is also possible to inject Himalayan knotweed stems utilizing special injector guns. Stems are generally thinner with smaller voids so injection can be a little trickier than other knotweeds. Use a 100% glyphosate solution, but be aware of label limits on ounces per acre. This method works best in situations where they are other plants growing within the knotweed, since the possibility of drift is limited.
Japanese Knotweed *(Polygonum cuspidatum)*	B required control (county)	Herbicide is the only effective method to control knotweeds. **Foliar treatment**- 1% Imazapyr mixture. Tall knotweed stems are bent below waist level in summer and herbicide is sprayed on leaves a couple of weeks later. The bending of stems causes less drift and is better for applicators since they are not spraying herbicide above their heads. **Injection**- it is also possible to inject knotweed stems utilizing special injector guns. Use a 100% glyphosate solution, but be aware of label limits on ounces per acre. This method works best in situations where they are other plants growing within the knotweed, since the possibility of drift is limited.
Bohemian Knotweed *(Polygonum bohemicum)*	B NOT required control	Herbicide is the only effective method to control knotweeds. **Foliar treatment**- 1% Imazapyr mixture. Tall knotweed stems are bent below waist level in summer and herbicide is sprayed on leaves a couple of weeks later. The bending of stems causes less drift and is better for applicators since they are not spraying herbicide above their heads. **Injection**- it is also possible to inject knotweed stems utilizing special injector guns. Use a 100% glyphosate solution, but be aware of label limits on ounces per acre. This method works best in situations where they are other plants growing within the knotweed, since the possibility of drift is limited.
Policeman's Helmet (*Impatiens glandulifera)*	B required control (state)	This annual can be easily control by **hand pulling.** Repeated pullings are necessary throughout the growing season as this plant flowers through the warmer months. Once plants are pulled stems should be crushed, then plants can be left on site to decompose, preferably on a tarp or cardboard. Seeds are viable for 18 months, so two years of pulling eliminates this plant from a site.
Yellow Archangel (*Lamiastrum galeobdolon)*	B required control (state)	**Foliar treatment** should utilize 1% Imazapyr mixture or 2.5% glyphosate mixture. Spray when actively growing. Follow up treatments will be necessary. **Hand pulling** is NOT effective since plants can grow from root fragments left in ground and over 6 years is required to remove vegetative cover. Do NOT weedeat this groundcover as it can spread from broken stem fragments.
Scotch Broom *(Cytisus scoparius)*	B required control (county)	**Manual removal** is effective. Hand pull/ dig out small plants. Weed Wrench larger plants. Large brooms without green on main trunk can be cut, usually about 2 inch diameter. **Herbicide** foliar applications can be effective in spring and fall when plant is actively growing. Preferred formulation is 1.5 -2% glyphosate mixture. Cut stump herbicide treatments are effective, and have less collateral damage than foliar application. Use 100% glyphosate concentration and apply immediately after cutting trunk.
Tansy Ragwort *(Senecio Jacobaea*)	B required control (county)	**Manual removal** is effective on small patches. Tansey Ragwort is poisonous to livestock and may contain irritants in plant fibers, wear gloves and long sleeves when handling. Pull plants in second year when flowering stems are erect. Dig up rosettes of first year plants. Bag plants and remove plant material from site because stored energy allows pulled plants to develop mature seeds. **Foliar treatment** should occur in spring before flowering. 2,4-D herbicides are preferred because they will not kill surrounding grasses, which can help prevent seed fecundity and suppress Tansey ragwort seedlings. **Mechanical** control does not work. Plants flower on shorter stems.
Poison Hemlock *(Conium maculatum)*	B required control (county)	**Manual removal** always wear long sleeves, gloves and a dust mask when handling poison Hemlock. Second year plants with flower stalks can be pulled/dug up. Rosette stage plants can be dug up. **Foliar treatment** is most effective at rosette stage. Second year plants should be sprayed before flowering stage. Glyphosate mixture 1-1.5%. In grassy areas consider using a 2,4-D herbicide to prevent killing surrounding grasses, which compete with poison hemlock seedlings. **Mechanical** mowing will not kill plant but could prevent seed production.
Common Tansy *(Tanacetum vulgare)*	C required control (county)	**Manual removal** is possible on small patches. Spreads by seeds and rhizomes, so grub area thoroughly to get all root materials. **Foliar treatment** is best method to eliminate infestations. Use a 2,4-D herbicide in spring to kill Tansey but not grass which competes with seedlings. Glyphosate is most effective in early flower bud stage. **Mechanical** can prevent seed production but does not eliminate infestation.
Field Bindweed Morning Glory *(Convolvulus arvensis)*	C required control (county)	**Manual removal** requires several years to exhaust energy supplies in roots. Remove plant material from site for disposal in trash. **Smothering** requires several years to kill roots. Mulch must be reapplied every year. Also check for creep as plants grow out from covering. **Mechanical** is not effective and can spread infestation since plants can regrow from stem and root fragments. **Foliar treatment** of 2,4-D is best in summer and this herbicide will not harm surrounding grasses. Glyphosate, applied at 1% is best applied at full bloom to early seed stage.
Bull Thistle *(Cirsium vulgare)*	C required control (county)	**Manual removal** pull plants once stems have elongated or dig up rosettes getting at least 1 inch of taproot. **Mechanical** mowing rosettes is not useful, but mowing once plants have sent up flowering stem in second year is useful. Follow-up might be required because some plants can re-flower with a shorter stem. **Foliar treatment** is best accomplished during rosette year either in spring or fall. Glyphosate mixture of 1%-2% works best.
Canada Thistle *(Cirsium arvense)*	C required control (county)	**Manual removal** is not effective. This does not get the spreading roots. **Mechanical** control only prevents blooming and does nothing to prevent infestation growth. To eliminate an infestation mowing must occur monthly over several years. If mowing once a year; the best time is just before flower blooming. Late spring mowing can be combined with fall herbicide application for most effective treatment. **Foliar treatment** is best done in summer, before flowering. If combined with a previous mowing foliar treatment can occur in late summer, before flower blooming.
Common Teasel *(Dipsacus fullonum)*	C required control (county)	**Manual removal** can be conducted on rosettes or flower stalks. Dig up rosettes getting as much root as possible. Or cut flowering stalks once flowering has initiated and remove plant material from site, as it can still produce viable seeds. Another possible method is to sever flowering stalk from taproot underground using a shovel. Remove stalk from site. **Mechanical** mowing is not effective as rosettes continue to grow and bolted plants can re-sprout after stalks cut. **Foliar treatment** is only effective in rosette stage with 2,4-D in spring or fall. No information on glyphosate effectiveness available.

Species	Class	SFEG treatment method
English Ivy *(Hedera helix)*	C No required control	**Manual removal** is the best option. Hand pull vines growing along the ground or if they have formed a thick mat try and roll up like a carpet. Girdle vines growing up trees or structures. Cut and paint stems growing into the soil. Vines climbing trees will die when girdled. **Mechanical** control is not a valid option. **Foliar treatment** should only be used if hand removal proves too difficult. This works best on new leaves, especially in the spring, because they have a thinner wax cuticle. Use a 5% glyphosate mixture. Another approach is to remove most of the leaves from the vines, for example with a weedeater and then utilize a foliar application of herbicide once the vines have leafed out again.
Evergreen Blackberry *(Rubus lacinaitus)* Himalayan Blackberry *(Rubus armeniacus)*	C No required control	**Manual removal** is only feasible on small patches or individual scattered plants. Remove root ball by either digging up or pulling using main canes. Plants will re-sprout from root material left in ground. **Mechanical** control conducted annually will not eliminate blackberries. Some evidence suggests that moving blackberries multiple times a year over multiple years may exhausted stored energy in roots. **Foliar treatment** is the most effective way to kill mature blackberry plants. **SFEG preferred treatment plan** is mowing blackberries in the summer with a weedeater. Applying glyphosate at a 5% mixture in fall. Mowing again the following summer if necessary, followed by another round of glyphosate treatment in the fall. This second round of herbicide is necessary because the dormant seed bank will sprout furiously with the new sun exposure. After the second year of herbicide treatment trees can be planted and blackberry control can be manual or chemical.
Old Man's Beard Traveler's Joy *(Clematis vitalba)*	C No required control	**Manual removal** is preferred for small patches. Girdle vines climbing trees and pull vines and roots from ground. If leaving plant material on site elevate stems above ground as clematis can re-root if vines remain in contact with moist soil. **Mechanical** control by itself does not control clematis and may cause it to come back thicker, plus large pieces could spread infestation. **Foliar treatment** apply 1% glyphosate mixture to leaves, preferable in spring, but anytime plant is growing will work. **Cut-and-paint** apply concentrated herbicide to cut stems, particularly the cut stems of vines girdled from climbing vines. **Possible method** pull vines from desirable plants. Weedeat large mats acting as ground cover. Follow up a couple of weeks later with foliar application to newly emerged leaves.
Reed Canary Grass *(Phalaris arundinacea)*	C No required control	**Manual removal** is not feasible. **Mechanical** control may eliminate reed canary grass but requires mowing more than 5 times per year over multiple years. **Foliar treatment** can suppress reed canary grass but does not eliminate infestation because plants regrow from seed bank. SFEG uses a glyphosate mixture of 1%-1.5%. **Shading** cover area with shade cloth or several layers of cardboard and 4-6 inches of mulch and leave for 2-3 years. **SFEG preferred method** is to plant in reed canary grass and maintain trees until they have reached a height to be self sufficient, about 5-6 feet. Maintenance methods include stomping around trees in late spring/summer once stems have become crunchy or mowing either entire field or circles around trees, preferably twice a year, spring and summer.
Spotted Jewelweed *(Impatiens capensis)*	C No required control	**Manual removal** is the preferred option for this annual. Pull plants before seed pods develop and crush the fresh stems and leave on site to desiccate. **Foliar treatment** is possible but not the preferred method of control. If desired, apply a 1% glyphosate mixture. Make sure to use a surfactant since jewelweed leaves are hydrophobic. SFEG does not always control Spotted Jewelweed on restoration sites. It is a project management decision.
Yellow Flag Iris *(Iris pseudacorus)*	C No required control	**Manual removal** is only possible on small patches. All rhizome fragments must be dug up and removed from site. **Mechanical** mowing above water level will not eradicate infestation, but could prevent spread while other control measures are implemented, especially if mowed during time of year to cut flower heads or before seed pods develop. Cutting below water level could be effective if plant parts are submerged for the entire year. This action will take a couple of years to kill plants, with follow-up cuttings required. **Foliar treatment** can be effective. Aquatic formulations are required since Yellow Flag Iris grows as a wetland obligate plant. Wiping on herbicide will cause less herbicide to enter water than spraying. Apply 5%-8% aquatic glyphosate in late spring to early summer either to leaves directly or cut leaves and apply to cut surface. Imazapyr at of rate of 1%-1,5% applied in the fall can also be effective, but SFEG prefers not to use this chemical as persistence in soil could affect nearby desirable plants.
Butterfly Bush *(Buddleja davidii)*	C No required control	**Manual removal** is the prefered method for smaller plants. Hand pull, dig up (including roots) or use a weed wrench. **Mechanical** mowing is nealy pointless, as the plant can easily regrow from cut stems and stumps. **Cut-stump** herbicide method worsk best on plants to large to manaully remove. Cut trunks just above ground level and immediately paint concentrated glyphosate onto exposed end. **EZ-ject** lance would probably be effective, but research has not been conducted on this. Likewise **foliar treatment** could be effective, but potential for overspray, especially in riparian areas, is great than with cut and paint method.
English Holly (Ilex aquifolium)	Not listed	**Manual removal** is the preferred method for small plants, hand pull or use weed wrench. Various **herbicide treatments** have been shown to be effective. **EZ-ject lance** is most effective with imazapyr shells, regardless of season. **Cut-stump** or **frill treatments** are most effective when the herbicide applied to the cut stump or frills in bark is triclopyr. Glyphosate has a less than 50% mortality rate for cut-stump and frill treatment applications. **Foliar treatment** is not effective and should not be utilized. **Mechanical** cutting only kills the portion of the plant above the cut. It does not kill the roots, which still work to produce new growth from the stump.