# As Built Planting & Maintenance Plan

## IMW Study Area Riparian Restoration - SRFB Project # 13-1405

**Includes Plans for Survival Monitoring, Irrigation & Weed Management**

**Asotin County Conservation District**
**2016**

## Table of Contents:

# OVERVIEW

In the spring of 2016 the Asotin County Conservation District planted nearly 4,000 native tree and shrubs in 12 sites containing 7.3 acres along the riparian corridor of the South Fork of Asotin Creek and Charlie Creek. Planting project was established with the objective to improve riparian function and increase stream dynamics for fish habitat by providing vegetation that will eventually make its way into the stream as large woody debris. Both streams are known to contain populations of threatened and endangered (T&E) fish.

Covenant Conservation Systems, LLC was the contractor selected to install trees and shrubs in the selected planting sites and provide irrigation. Planting began on 3/14/16 and was completed on 3/16/16. A drip irrigation system was installed in 11 of the 12 planting sites. Installation of the irrigation system was completed in June 2016 and watering began on June 15th.

**Planting Sites and Selection**

Sites locations were chosen based on areas with enough soil to support tree & shrub establishment. Five of the 12 sites contain strips of landscape fabric in which plants were planted to aid with weed control. All sites contain plants planted in open ground. Most plants were planted in open ground. Cottonwood cuttings were placed in the stream at water's edge in places where soil was available through all the site locations.

**Total of Trees & Shrubs Planted by Site Locations**

| Stream | Site # | In Fabric | Open Ground | In Stream | Total |
|---|---|---|---|---|---|
| Charley Creek | 1 | 0 | 555 | | **555** |
| Charley Creek | 2 | 0 | 167 | | **167** |
| Charley Creek | 3 | 53 | 555 | | **608** |
| Charley Creek | 4 | 0 | 388 | | **388** |
| Charley Creek | 5 | 0 | 253 | | **253** |
| Charley Creek | 6 | 0 | 126 | | **126** |
| Charley Creek | 7 | 163 | 310 | | **473** |
| Charley Creek | 8 | 117 | 160 | | **277** |
| Charley Creek | 9 | 70 | 270 | | **340** |
| Charley Creek | 10 | 0 | 100 | | **100** |
| South Fork | 11 | 112 | 166 | | **278** |
| South Fork | 12 | 0 | 212 | | **212** |
| Both streams | All | N/A | N/A | 200 | **200** |
| | Totals: | **515** | **3262** | | **3977** |

## TREE & SHRUB SPECIES

**Species Selection**
Only native species of trees and shrubs intended for local climate conditions were selected to increased survival and reflect historic local plant communities.

| Tree & Shrub Species Planted | |
|---|---|
| Cottonwood, 1 gallon containers | **61** |
| Ponderosa Pine | **1829** |
| Doug Fir | **822** |
| Rocky Mtn. Juniper | **557** |
| Choke Cherry bareroot | **282** |
| Choke Cherry plugs | **156** |
| Golden Currant, 1 & 2 gallon containers | **54** |
| Alder, 1 gallon containers | **16** |
| 18" Cottonwood Cuttings | **200** |
| Total: | **3977** |

## SURVIVAL MONITORING

**Timeline & Framework**
Tree survival will be tracked by species and by site location for a minimum of 3 growing seasons to include 2016, 2017 and 2018. Each planting site will be monitored separate to minimize potential loss of data due to fire or natural events. A complete site visit to collect mortality information should occur at the end of each growing season before plants enter dormancy stage.

Each tree was marked by a blue flag when planted. After planting was completed, all trees were counted and each flag was labeled with a code to identify species. Survival monitoring will begin with the known number of species in each site location as of March 31st, 2016, when final counts were complete.

For monitoring purposes, all flags shall remain in the ground next to trees that have died until removed by a district technician. Watering crews should not disturb any of the flags. Flags will be removed by district technicians only to ensure that all need data is recorded.

**Site Visit Data:**
A technician will visit the sites regularly throughout the growing season and conduct a final visit at the end of each growing season.

The following information will be collected by technicians at each site:

- Date of visit
- Site Number
- Number of tree mortality quantified by species in fabric
- Number of tree mortality quantified by species in open ground
- Notes of plant conditions, site condition and present weeds
- Record amount of water received by several randomly selected trees at site if watering crew is present
- Remove flags from each dead trees after mortality data has been recorded.

**Data Management**
All mortality and watering dates will be logged in an Excel spreadsheet to track rate of survival by species. Watering dates will be obtained for data entry from monthly bills submitted by the contractor to ACCD that states the dates trees were watered. Mortality numbers and dates will be entered from technician's field notes or preferably recorded on a monitoring data sheet.

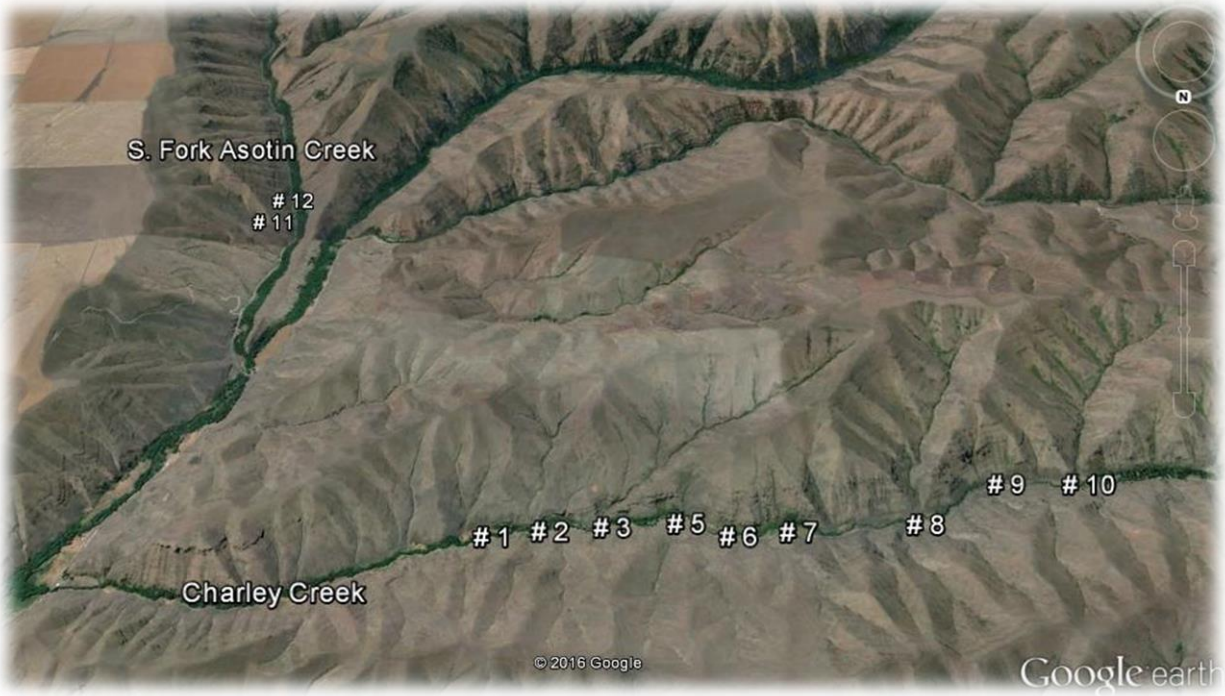
The following codes are marked on flags to identify species and planting locations:

| Tree Species Codes on Flags | Open Ground | In Fabric |
|---|---|---|
| Cottonwood, 1 gallon containers | **C** | **---** |
| Ponderosa Pine | **P** | **Px** |
| Doug Fir | **D** | **Dx** |
| Rocky Mtn. Juniper | **J or Ju** | **Jx** |
| Choke Cherry | **CC** | **CCx** |
| Golden Currant, 1 & 2 gallon containers | **GC** | **---** |
| Alder, 1 gallon containers | **A** | **---** |

## REPLANTING

Empty spaces in the landscape fabric should be replanted in the spring of 2017 only. Sites with open ground plantings only do not need to be replanted. Deer guards should be place on all new plantings.

# IMW PLANTING SITE MAPS
## Charley Creek & South Fork Asotin Creek




**All Sites #'s 1-12 (7.3 acres total)**


**Charley Creek Site # 1: Latitude: 46°17'7.42"N Longitude: 117°18'54.42"W**
Plantings on both sides of the stream. Wood debris crossing located as indicated.
1.7 Miles up Charley Creek Road (0.96 acres)


**Charley Creek Site # 2: Latitude: 46°17'6.40"N Longitude: 46°17'6.40"N**
Old dozer tractor setting under trees at end of site.
1.9 Miles up Charley Creek Road (0.33 acres)

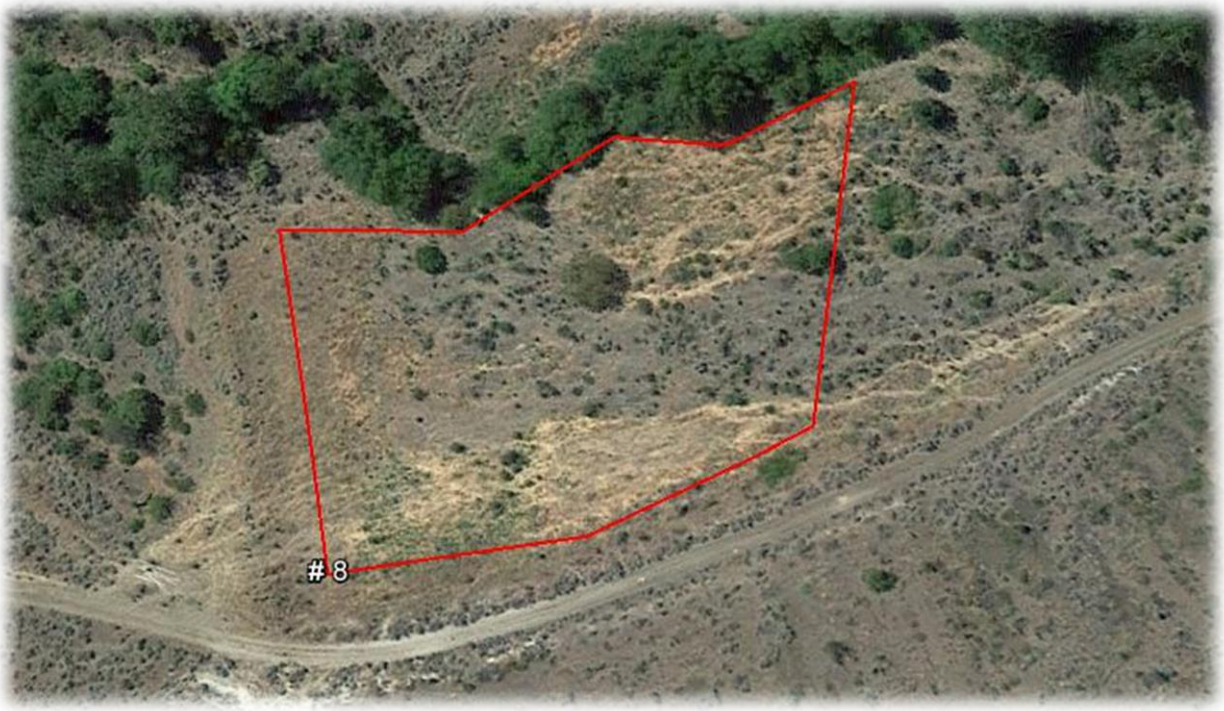

**Charley Creek Site # 3: Latitude: 46°17'5.61"N Longitude: 117°19'27.34"W**
Plantings on both sides of the road. Fabric strips in upstream section.
2.1 Miles up Charley Creek Road (1.12 acres)


**Charley Creek Site # 4: Latitude: 46°17'4.55"N Longitude: 117°19'39.62"W**
Plantings on both sides of the stream. Log crossing as indicated above.
2.3 Miles up Charley Creek Road (0.73 acres)

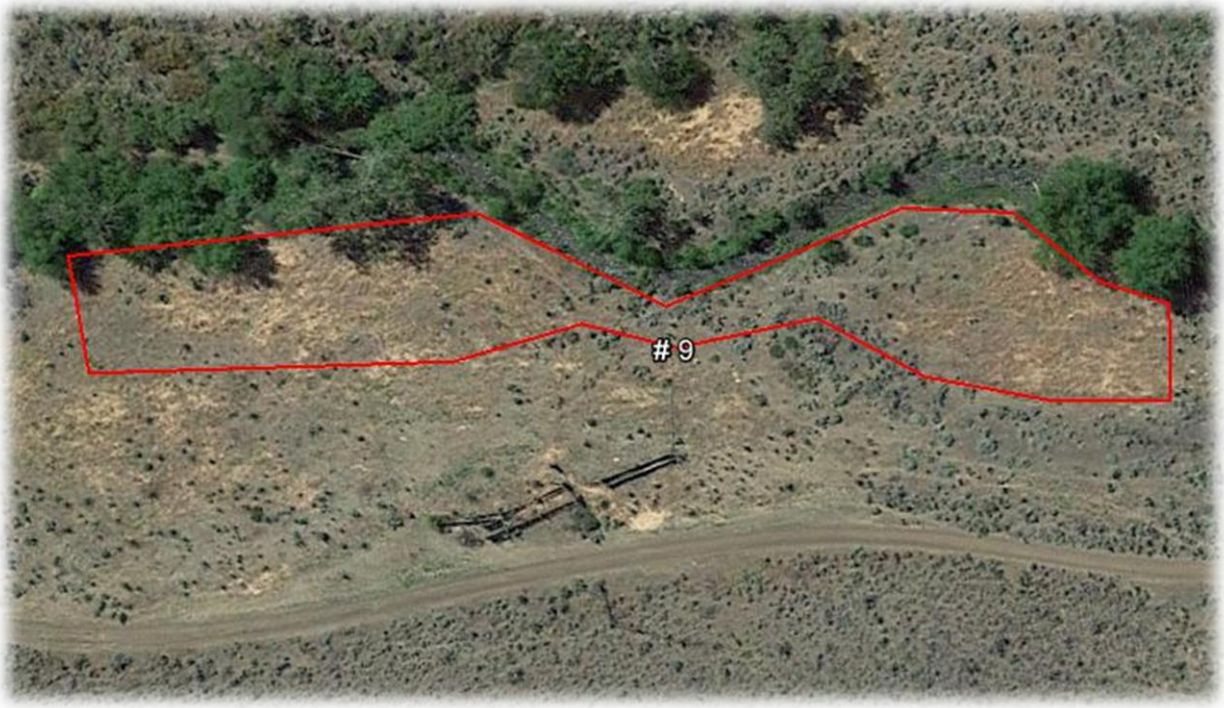

**Charley Creek Site # 5: Latitude: 46°17'4.92"N Longitude: 117°19'47.79"W**
2.4 Miles up Charley Creek Road (0.72 acres)


**Charley Creek Site # 6: Latitude: 46°17'7.82"N Longitude: 117°20'1.77"W**
Site is surrounded by an old side channel.
2.6 Miles up Charley Creek Road (0.22 acres)


**Charley Creek Site # 7: Latitude: 46°17'7.04"N Longitude: 117°20'18.27"W**
Site contains multiple fabric strips.
2.9 Miles up Charley Creek Road (0.85 acres)




**Charley Creek Site # 8: Latitude: 46°17'5.59"N Longitude: 117°20'52.97"W**
Site is located in old pond area behind a breached dam. Contains fabric strips.
3.3 Miles up Charley Creek Road (0.82 acres)




**Charley Creek Site # 9: Latitude: 46°16'56.24"N Longitude: 117°21'17.89"W**
Site is located behind old loading ramps. Contains fabric strips.
3.7 Miles up Charley Creek Road (0.48 acres)


**Charley Creek Site # 10: Latitude: 46°16'56.66"N Longitude: 117°21'40.42"W**
Site is located below old road and not irrigated. Trees planted on island in stream.
4.0 Miles up Charley Creek Road (0.31 acres)


**South Fork Sites #'s 11 & 12: Latitude: 46°15'31.27"N Longitude: 117°17'33.67"W**
Sites located 1 mile upstream of bridge on South Fork Rd. Site # 11 has fabric strips.
0.7 Miles above Campbell Road (# 11: 0.31 acres, # 12: 0.42 acres)

# IRRIGATION PLAN

**Watering Objectives**
Provide each tree with 1 gallon of water per watering to establish root systems and increase survival from May to September of the growing season. Trees will be watered once per week in May to mid-June or until weather conditions get hot and dry enough to warrant watering each tree one gallon twice per week.

**Timeline & Framework**
Irrigation will occur for a minimum of 2 years to include the growing seasons of 2016 and 2017. Covenant Conservation Systems, LLC installed a drip system in 11 of the 12 planting sites to provide water by truck. Site # 10 on Charley Creek was excluded form watering due to lack of access to turn the water truck around.

A site visit should occur before each watering season to determine the number of plants that will be watered and ensure flags are in place to identify species.

**Role of the Irrigation Contractor:**
Contractor will provide monthly bills to ACCD that clearly states the date trees were watered and the number of trees watered as specified in the contract. Watering crew should not remove or disturb any flags next to trees and shrubs. The drip systems should be tested and calibrated regularly to ensue plants are receiving 1 gallon of water.

# WEED MAMAGMENT PLAN

## INTRODUCTION

This weed management plan was prepared for the Asotin County Conservation District tree & shrub planting sites located in Asotin Creek drainage, along Charlie Creek and the South Fork of Asotin Creek, through the cooperative efforts between the Asotin County Noxious Weed Control Board, Washington Department of Fish and Wildlife (WDFW), and the Asotin County Conservation District (ACCD).

In the spring of 2016 the ACCD planted nearly 4,000 native tree and shrubs in 12 plots containing 7.3 acres at selected sites along the riparian corridor of both the South Fork of Asotin and Charlie Creeks. Within these two streams reside both threatened and endangered (T&E) fish. The work was done to enhance riparian health and assist in the introduction of large woody debris into the waters for fish habitat and other associated species. ACCD is also conducting a study to monitoring plant survival by species. A September survey was conducted between David Woodall and Amanda Schmidt. This survey was intended to assist in the planning for future weed control activities in the coming years. The plan contains shrub plot maps, an herbicide guide, a backpack calibration guide, a cheat sheet for herbicide mixtures and information on individual weeds found in the survey area.

The plan includes a summary of recommendations for this particular area based on the survey that was completed in September, 2016. The land manager and/or associated partners should feel free to use the recommendations or use the individual weed guide for help in choosing the method that works best for them.

For any questions please call:
David Woodall - Washington Department of Fish & Wildlife at (509) 758-3151
Amanda Schmidt – Asotin County Conservation District at (509) 552-8098.

# RECOMMENDATIONS

**Site Overview**

Planted sites are in extremely weedy condition at the time of the site visit in September 2016. Considering the variety of weed species that are present, and the fact that both native trees and shrubs are planted within this T&E riparian corridor this certainly presents some management challenges. Weed control measures called for in this type of scenario should include both a combination of mechanical and chemical techniques.

**Weed Control Techniques**

This report tries to simplify weed management issues by recommending two different weed control techniques, mechanical and chemical:

Mechanical Techniques: Mechanical techniques either destroy weeds or make the environment less favorable for seed germination and weed survival. Using this method minimizes tree and shrub mortality due to herbicide drift but is very labor intensive. Techniques include hand-pulling, hoeing, mowing, plowing, disking, cultivating and digging. These methods should be used to control weeds growing near seedling plants where using herbicide may harm them. Mechanical techniques would require the use of hand tools such as hoes, shovels and machetes.

Chemical Techniques: Herbicides can be a convenient, economical, and effective way to manage weeds. Chemical techniques would require the use and knowledge of herbicides, applicator tools, and safety equipment. This scenario would call for using hand wicker or wiper applicator tools within the tree and shrub planting and/or a back pack sprayer on the perimeter of the plots being very meticulous and selective using only spot spray techniques.

**Herbicide Recommendations**

In this scenario applicators must take care to select herbicides that are compatible with weed species that grow near the water's edge and are also co-located within native tree and shrub plantings. Use of herbicides that may have a long residual should be avoided. 2,4-D is highly recommended for use in newly planted areas.

**Herbicide Application & Precautions:**

The need for knowledgeable, competent, and highly trained weed professionals is paramount. In order to minimize the loss of native trees and shrubs, weed control applicators must be familiar with both native and non-native plant species, the overall project's objective to enhance fish and wildlife habitat, local laws and cultural uses, and herbicide label regulations. Care must also be taken when spraying close to water, making sure that you spray away from the water's edge, toward land, to eliminate any spray droplets that may enter the water. Weed should be treated on warm, dry, wind free days, approximately 60-80 degrees Fahrenheit to allow the plants to absorb herbicides more efficiently for a better rate of kill. Applications

above or below this temperature range or on windy days prove to be less efficient and may cause additional harm to nearby plants.

**Time Line**
Due to the extremely weedy conditions observed in September 2016, sites require more than one treatment a season due to the excessive seed bank in the soil. The weeds in the ACCD tree & shrub plots should be treated multiple times over the course of the growing season. In the spring (early May), then checked for additional growth and treatment in June, and then treated again late summer-early fall (late September-early October.

**Weeds of Concern**
Most of the tree & shrub plots have scattered Scotch thistle, mullein (not a listed noxious weed), hounds tongue and teasel. There is some field bindweed. Some areas may be boomed but others need careful application to avoid harming the new plants.

White bryony is a high priority weed species. It is spread by birds and has the potential to devastate plantings. It was found in one location along Charley Fork. It is located on the north side of the creek and it was marked with three strips of pink flagging tied to a fence post along the road. When barriers are green in late spring, simply pull the vines down to prevent their ripening. The plants can also be killed by cutting off the top 1”-2” of the root.

Sulfur cinquefoil is a high priority weed species in Asotin County and was found in numerous sites along the creek. It will eventually dominate some of those benches so it is a good time to treat it. Chaparral is an excellent herbicide for this weed and other weeds.

Rush skeletonweed is a high priority species in Asotin County. Treatment should be limited to the rosette stage or flowering stage. We have had very poor luck with plants that are bolting. Since this plant is easiest to see while it is in bloom, most treatments are done during this time period. 7 oz Milestone with ½ oz Edict/acre has worked very well.

# HERBICIDE GUIDE

**This information is not intended as a complete guide to herbicide use. Any use of pesticides or other chemicals contrary to the instructions on the printed label is neither legal nor recommended. Before a chemical can be recommended for a specific use, it must be thoroughly tested. The recommendation on the manufacturer's label, when followed, can prevent many problems arising from the wrong use of a chemical. Some brand names are used in this management plan because they are widely recognized. No endorsements of any herbicides are implied by the Asotin County Noxious Weed Board, WDFW or ACCD.**

**DICAMBA + 2,4-D (Weedmaster or Pasturemaster)**

**Rate:** 0.5 to 4 pints product/A
**Time:** When weeds are actively growing.
**Remarks:** For pasture, range, and non-cropland. Spot spraying rates can go as high as 6 pints/A; see label for weeds controlled at higher rates.
**CAUTION:** Do not apply when grass is in boot stage. See label for grazing restrictions.
**Site of action:** (both) Group 4: synthetic auxin
**Chemical family:** (dicamba) benzoic acid; (2,4-D) phenoxy acetic acid

**CLOPYRALID (Stinger or Transline)**

**Rate:** 0.5 to 1.33 pints/A
**Time:** Apply to young, actively growing weeds. Established grasses are tolerant. Apply to Canada thistle after most basal leaves have emerged but before bud stage.
**Remarks:** Apply only once in a 12-mo period. Do not allow drift to crops. May be tank mixed with 2,4-D. Grasses may be planted any time after application.
**CAUTION:** Do not spray pastures if forage legume component is desired. See label restrictions on planting crops into treated areas. Before moving livestock from treated site into sensitive crop areas, allow 7 days of grazing on an untreated pasture.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**AMINOPYRALID + metsulfuron (Chaparral)**

**Rate:** 1 to 3.3 oz/A
**Time:** Apply postemergence to actively growing plants or in the fall over senesced Russian knapweed plants or preemergence or postemergence for marestail control.
**Remarks:** Controls a range of broadleaf weeds, including many in the sunflower and legume families. In general, 2 oz/A controls most pasture weeds with lower rates (< 2 oz/A) effective on annual weeds and higher rates (>2 oz/A) effective on woody weeds. No restrictions on grazing or hay harvest. Surfactants have similar effects in combination with aminopyralid.

**CAUTION:** Do not exceed 3.3 oz/A of Chaparral in 1 year. Allow 3 days after grazing on Chaparral-treated forage before moving grazing animals to areas with plants sensitive to aminopyralid. Do not use plant residues that were treated within 3 days before harvest for compost or mulch that will be applied to susceptible broadleaf plants.
**Site of action:** aminopyralid Group 4: synthetic auxin; metsulfuron-methyl Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Pyridine

**2,4-D (several products)**

**Rate:** 0.71 to 2 lb ae/A
**Time:** Spray when annual weeds are young, succulent, and actively growing. Treat perennial weeds at the specific growth stage(s) described on the label.
**Remarks:** Controls many annual, biennial, and perennial broadleaf weeds in rangeland and grass pastures. Also controls certain brushy species, including sagebrush, rabbitbrush, manzanita, and some chaparral species. Deep-rooted perennial weeds and woody plants usually require repeated applications for maximum control. See label for rates for various weed species and for proper application timing.
**CAUTION:** Do not apply if spray drift may contact nearby crops or desirable plants or contaminate water for irrigation or domestic use. Do not graze meat animals within 3 days of slaughter. Do not graze dairy animals within 7 days after application. Do not cut hay within 30 days after application. Do not use on bentgrass, alfalfa, clover or other legumes, or on newly seeded pasture. When grass seed production is desired, do not apply after heading begins or when grass is in the boot to milk stage. Kills legumes.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Phenoxy acetic acid

**AMINOPYRALID (Milestone)**

**Rate:** 0.75 to 1.75 oz ae/A (3 to 7 oz/A)
**Time:** Apply postemergence to actively growing plants or in the fall over senesced Russian knapweed plants or preemergence or postemergence for marestail control.
**Remarks:** Controls a range of broadleaf weeds, including many in the sunflower and legume families. No restrictions on grazing or hay harvest. Surfactants have similar effects in combination with aminopyralid.
**CAUTION:** Do not exceed 7 oz/A of Milestone in 1 year. Allow 3 days after grazing on aminopyralid-treated forage before moving grazing animals to areas with plants sensitive to aminopyralid. Do not use plant residues that were treated within 3 days before harvest for compost or mulch that will be applied to susceptible broadleaf plants. Hay cannot be moved off farm if treated with Milestone in the preceding 18 months, unless allowed by supplemental labels; see label for details.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**AMINOPYRALID + 2,4-D (Forefront R&P)**

**Rate:** 1.5 to 2.6 pints/A

**Time:** Apply when weeds are young and actively growing.

**Remarks:** Use 1.5 to 2 pints/A on common vetch, yellow woodsorrel, and absinth wormwood. Most susceptible species can be controlled with 2 to 2.6 pints/A.

**Caution** Do not plant grasses for 30 days after application. Do not use on newly seeded grass areas until grass is well established. May suppress smooth bromegrass. Do not spray pastures containing desirable forbs, especially legumes, unless injury can be tolerated. Allow 3 days after grazing before moving animals to areas with desirable sensitive broadleaf plants. Do not graze dairy cattle in treated area for 14 days after application. Remove meat animals from area 7 days before slaughter if pasture was treated less than 2 weeks earlier. Do not cut for hay within 14 days after application. Do not use straw or manure from treated areas for compost or mulch. Wait one year after application to rotate to cropland.

**Site of action:** (both) Group 4: synthetic auxin

**Chemical family:** (aminopyralid) pyridine; (2,4-D) phenoxy acetic acid

**GLYPHOSATE (several products)**

**Rate:** 0.1875 to 3.75 lb ae/A

**Time:** Annual weeds are best controlled when small and actively growing. Apply to actively growing perennial weeds at or beyond full flower. Results are best if applied in late summer or fall after fruit forms. Fall treatments must be before a killing frost.

**Remarks:** Controls many annual and perennial weed species before renovating pastures. Rates depend on weed species, stage of growth, and density. Repeat treatments may be necessary to control weeds regenerating from underground parts or seed. May also be applied as a spot treatment or by wiper application to established pastures, but do not treat more than 10% of any acre at one time. Further applications may be made to the same area at 30-day intervals.

**CAUTION:** A nonselective herbicide that kills forage plants on contact. Total treatments must not exceed 8 lb ai/A per year. Remove domestic livestock before application. Wait 8 weeks after broadcast application and 14 days after spot or wiper application before grazing or harvesting.

**Site of action:** Group 9: inhibits EPSP synthase

**Chemical family:** None generally accepted

**IMAZAPIC (Plateau, Panoramic)**

**Rate:** 0.0312 to 0.1874 lb ai/A (2 to 12 oz/A)

**Time:** Annual weeds are best controlled preemergence up to small, actively growing plants. Apply to actively growing perennial weeds at or beyond full flower. Results are best if applied in late summer or fall after fruit forms. Leafy spurge can be sprayed before the latex stops flowing in fall (test by breaking open a stem to see whether latex will ooze from the wound). Russian knapweed and Dalmatian toadflax can be controlled in late fall.

**Remarks:** Use lower rates (4 to 6 oz/A) for early-season downy brome control. Higher rates (8 to 12 oz/A) applied in late summer or fall are needed to control leafy spurge. Fall to early winter application at rates above 0.125 lb ai/A (8 oz/A) may injure establishing perennial grasses. New plantings of bluebunch wheatgrass (Pseudoroegneria spicata), intermediate wheatgrass (Thinopyrum intermedium), crested wheatgrass (Agropyron cristatum), Bozoiski Russian wildrye (Psathyrostachys juncea), Siberian wheatgrass (Agropyron fragile), and big squirreltail (Sitanion jubatum) have survived preemergent fall application of imazapic.
**CAUTION:** Do not cut hay for 7 days after application. Do not exceed 12 oz/A in a calendar year.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Imidazolinone

**METSULFURON (Escort XP)**
**Rate:** 0.33 to 2 oz/A Escort
**Time:** Apply postemergence to actively growing weeds.
**Remarks:** Controls a wide range of broadleaf weeds. For best results, use a nonionic or organosilicone surfactant.
**CAUTION:** Consult labels for each product; labels differ significantly. Note restrictions on label for use on fescue, timothy, and ryegrass pastures. After applying 3.33 oz/A, wait 3 days to graze. No grazing restriction at or below 1.66 oz/A. Note recropping restrictions on label. Grass may be planted 60 to 90 days after application.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Sulfonylurea

**PICLORAM (Tordon 22K)**
**Rate:** 0.5 pint to 2 quarts/A
**Time:** Treat when weeds are growing actively, in the spring before full bloom, or in late summer or fall. Re-treat in subsequent years as needed.
**Remarks:** Controls many troublesome perennial and woody weed species including thistles, yellow starthistle, leafy spurge, knapweeds, field bindweed, rabbitbrush, rush skeletonweed, and poison-oak. Rates depend on weed species and plant density. Apply at rates over 0.5 lb ae/A as spot-treatments only and not to exceed 25% of landowner's acreage in any particular watershed in a single season.
**CAUTION: Most formulations are restricted-use herbicides**. Do not apply on or near susceptible crops or desirable plants. Label includes buffer zone restrictions, air temperature limits, and grazing restrictions. Do not contaminate water or where surface water from treated areas can run off to adjacent cropland. Do not apply to inner bank or bottom of irrigation ditches. Do not apply to snow or frozen ground. Do not allow grazing in areas where poisonous plants were sprayed until plants have died, herbicide may increase palatability. Do not spray pastures if the forage legume component is desired. Do not move treated

soil. Do not transfer livestock onto crop areas for at least 7 days after grazing on land treated with picloram. See label for other grazing restrictions.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**TRICLOPYR + 2,4-D (Crossbow)**

**Rate:** Spot treatment: use 1 to 1.5% mixture in water. Broadcast: up to 1.5 gal/A (3 lb ae of 2,4-D and 1.5 lb ae of triclopyr).
**Time:** Postemergence, to actively growing plants.
**Remarks:** Controls many woody plants as well as annual and perennial broadleaf weeds.
**CAUTION:** No forage may be sold for commercial purposes.
**Site of action:** (both) Group 4: synthetic auxin
**Chemical family:** (triclopyr) pyridine; (2,4-D) phenoxy acetic acid

# Cheat sheet for Herbicide Mixtures

Handgunning & Back pack spraying:
Figure roughly 50 gal/acre application rate unless otherwise calibrated
Boom Spraying
Mix to calibrated rate of gallons per acre output of spray unit being used.
For MOST handgun & backpack applications, these rates apply :
**2 qt/acre** = 1.28 oz x # of gallons water = oz of herbicide for mixture
(Eg. For a 3 gallon backpack: 1.28 x 3 = 3.84 )
**1 qt/acre** = .64 oz x # of gallons water = oz of herbicide for mixture
(Eg. For a 3 gallon backpack: .64 x 3 = 1.92 or 2 oz herbicide)
**1 pt/acre** = .32 oz x # of gallons water = oz of herbicide for mixture
(Eg. For a 3 gallon backpack: .32 x 3 = 0.96 or 1 oz herbicide)

**TELAR or ESCORT:** 1 oz herbicide/acre rate + **SylTac** (sticker): 1 pt/50 gal water
Telar Examples:

| | |
|---|---|
| *3 gallon backpack:* | *Use 2 Grams of Telar + .96 oz (round to 1 oz) Syl-Tac* |
| *10 gallon sprayer:* | *Use 7 Grams of Telar + 3.2 oz (round to 3 oz) Syl-Tac* |
| *15 gallon sprayer:* | *Use 10.5 Grams of Telar + 4.8 oz (round to 5 oz) Syl-Tac* |
| *20 gallon sprayer:* | *Use 14 Grams Telar + 6.4 oz (round to 6.5 oz) Syl-Tac* |
| *25 gallon sprayer:* | *Use .5 oz of Telar + 8 oz Syl-Tac* |
| *50 gallon sprayer:* | *Use 1 oz of Telar + 16 oz Syl-Tac* |

Escort Examples:

| | |
|---|---|
| *3 gallon backpack:* | *Use 1.5 Grams of Escort + .96 oz (round to 1 oz) Syl-Tac* |
| *10 gallon sprayer:* | *Use 5 Grams of Escort + 3.2 oz (round to 3 oz) Syl-Tac* |
| *15 gallon sprayer:* | *Use 7.5 Grams of Escort + 4.8 oz (round to 5 oz) Syl-Tac* |
| *20 gallon sprayer:* | *Use 10 Grams Escort + 6.4 oz (round to 6.5 oz) Syl-Tac* |
| *25 gallon sprayer:* | *Use .5 oz of Escort + 8 oz Syl-Tac* |
| *50 gallon sprayer:* | *Use 1 oz of Telar + 16 oz Syl-Tac* |

**REDEEM or CURTAIL or GARLON 3a:** 2qt/acre rate=1.28 oz/gallon of water
*3 gallon backpack: 4 oz*
*15 gallon sprayer: 19 oz*
*25 gallon sprayer: 32 oz*
*50 gallon sprayer: 64 oz*

**TORDON 22K** : 1 qt/acre rate =.64 oz gal of water : 2qt/acre rate=1.25 oz/gal of water
*3 gallon backpack: 2 oz Tordon 22K(1qt): 4 oz Tordon 22k (2qt)*
*15 gallon sprayer: 9.5 oz Tordon 22k(1qt): 19 oz Tordon 22k (2qt)*
*25 gallon sprayer: 16 oz Tordon 22K(1qt): 1qt Tordon 22k (2qt)*
*50 gallon sprayer: 32 oz Tordon 22k(1qt): 2qt Tordon 22k (2qt)*

**WEEDAR 64** : 1 qt/acre rate =.64oz/gal of water; 2 qts/acre rate =1.28oz/gal of water
*3 gallon backpack: 2 oz Weedar 64 (1qtl); 4 oz Weedar 64 (2qt)*
*15 gallon sprayer: 9.5 oz Weedar 64(1qt): 19 oz Weedar 64 (2qt)*

*25 gallon sprayer: 16 oz Weedar 64 (1qt); 32 oz Weedar 64(2qt)*
*50 gallon sprayer: 32 oz Weedar 64(1qtl); 64 oz Weedar 64(2qt)*

**CLARITY or BANVEL**: 1 pt/acre rate =.32oz/gal water; 1qt/acre rate=.64oz/gal
*3 gallon backpack: 1 oz Clarity (normal); 2 oz Clarity (heavy)*
*15 gallon sprayer: 5 oz Clarity (normal: 10 oz Clarity (heavy)*
*25 gallon sprayer: 8 oz Clarity (normal); 16 oz Clarity (heavy)*
*50 gallon sprayer:16 oz Clarity (normal);32 oz Clarity (heavy)*

**WEEDAR 64 + TORDON 22K** : 1 qt Weedar 64 + 1 pt Tordon 22K/ac
*3 gallon backpack: 2 oz Weedar 64 + 1 oz Tordon 22K*
*15 gallon sprayer: 10 oz Weedar 64 + 5 oz Tordon 22k*
*25 gallon sprayer: 16 oz Weedar 64 + 8 oz Tordon 22K*
*50 gallon sprayer: 32oz Weedar 64 + 16 oz Tordon 22k*

**WEEDAR 64 + CLARITY or BANVEL** : 1 qt Weedar 64 + 1 pt Clarity /ac
*3 gallon backpack: 2 oz Weedar 64 + 1 oz Clarity*
*15 gallon sprayer: 9.5 oz Weedar 64 + 5oz Clarity*
*25 gallon sprayer: 16 oz Weedar 64 + 8 oz Clarity*
*50 gallon sprayer: 32 oz Weedar 64 + 16 oz Clarity*

**MILESTONE**
*3 gallon backpack: .36oz Milestone ( =10.25grams)*
*15 gallon sprayer:1.8 oz Milestone*
*25 gallon sprayer: 3oz Milestone*
*50 gallon prayer: 6 oz Milestone*

## Adjuvant/Surfactant Mixing

Generally surfactants are mixed at 1 pint/50 gallons water unless otherwise stated.

Examples:
R-11 at 1 pint/50 gallons
Syltac at 1 pint/50 gallons
MSO at 1 pint/50 gallons
Hasten at 1 pint/50 gallons
Non-Ionic 90 at 1 pint/50 gallons

*3 gallon backpack: .96 oz (round to 1 oz)*
*10 gallon sprayer: 3.2 oz (round to 3 oz)*
*15 gallon sprayer: 4.8 oz (round to 5 oz)*
*20 gallon sprayer: 6.4 oz (round to 6.5 oz)*
*25 gallon sprayer: 8 oz*
*50 gallon sprayer: 16 oz (1pint)*

## BACKPACK SPRAYER CALIBRATION

**NO MATH VERSION**

**Step 1.** Measure and mark a calibration plot that is exactly
**18.5 feet wide X 18.5 feet long**

**Step 2.** Spray the calibration plot uniformly with water, noting the number of seconds required, do this three times and average. Spray at your normal or usual pace.

**Time Required = _____Seconds**

**Step 3.** Spray into a bucket for the same number of seconds.

**Step 4.** Measure the number of ounces of water in the bucket.

**Volume Sprayed = _____ Ounces**

**Step** 5. The number of ounces collected from the bucket is equal to the number of gallons per acre the sprayer is delivering.

Gallons Per Acre (GPA) = _____

**CORRECT AMOUNT OF HERBICIDE PER TANK**
**FOR LIQUID HERBICIDE FORMULATIONS**

**STEP** 1: Record sprayer output in gallons/acre (from step 5 calibration sheet)

Output (Volume) = _____GPA

**STEP 2:** Determine volume of full spray tank.

Tank volume = _____gallons

**STEP** 3: From the herbicide label determine the amount of herbicide concentrate to apply per acre.

**_____Herbicide per acre, oz, pts, qts.**

| **STEP 4:** Determine the amount of herbicide to add for each gallon of water in the sprayer from the chart below. Spray Volume GPA | Amount of Herbicide to Add To Each Gallon | | | | |
|---|---|---|---|---|---|
| | **Recommended Herbicide Rate Per Acre** | | | | |
| | 1 Pint | 1 Quart | 2 quarts | 3 quarts | 4 quarts |
| 15 | 6tsp | 2 fl/oz | 4 fl/oz | 6.25 fl/oz | 6.50 fl/oz |
| 20 | 5tsp | 10 tsp | 3.25 fl/oz | 4.75 fl/oz | 6.33 fl/oz |
| 30 | 3tsp | 6 tsp | 2 fl/oz | 3.25 fl/oz | 4.25 fl/oz |
| 40 | 2.33 tsp | 4.75 tsp | 1.66 fl/oz | 2.33 fl/oz | 3.25 fl/oz |
| 50 | 2 tsp | 3.75 tsp | 1.25 tsp | 2 fl/oz | 2.50 fl/oz |
| 60 | 1.66 tsp | 3.25 tsp | 6.33 tsp | 1.66 fl/oz | 2 fl/oz |
| 70 | 1.33 tsp | 2.75 tsp | 5.50 tsp | 1.33 fl/oz | 1.75 fl/oz |
| 80 | 1.25 tsp | 2.33 tsp | 4.75 tsp | 7.25 tsp | 9.50 tsp |
| 90 | 1 tsp | 2 tsp | 4.25 tsp | 6.33 tsp | 8.50 tsp |

| | | | | | |
|---|---|---|---|---|---|
| 100 | 1 tsp | 2 tsp | 3.75 tsp | 5.75 tsp | 7.66 tsp |
| 120 | 0.75 tsp | 1.50 tsp | 3 tsp | 4.75 tsp | 6 tsp |

**STEP 5:** Calculate the amount of herbicide to add to each tank.
_____ Amount of herbicide/gallon X _____ number of gallons in tank
= _____ Total amount of herbicide to add to each tank load.
**Example:** You calibrate your sprayer and the output is 30 GP A, and your sprayer holds 3 gallons. You are spraying spotted knapweed and want an **herbicide application rate** of I pint/acre. Go to the
chart and read across from 30 GallA - the amount of herbicide to add per gallon is 3 tsp.. Since your
sprayer holds 3 gallons of total solution you would add 9 tsp (3 TBS) of herbicide in addition to the water to each tank.

**Liquid conversions:** tsp = teaspoons; TBS = tablespoons; fl oz = fluid ounces, 3 teaspoons = 1 tablespoon, 8 fluid ounces = 1 cup,
2 tablespoon = 1 fluid ounce, 1 cup = 16 tablespoons.

**CORRECT AMOUNT OF HERBICIDE PER TANK**
**FOR ESCORT DISPERSIBLE GRANULE HERBICIDE**
**STEP 1:** Record sprayer output in gallons/acre (from step 5 calibration sheet)
Output (Volume) = _____GPA
**STEP 2:** Determine volume of full spray tank.
Tank volume = _____gallons
**STEP 3:** From the herbicide label determine the amount of herbicide to apply per acre.
_____**Herbicide per acre, oz, pts, qts.**

| **STEP 4:** Determine the amount of herbicide to add for each gallon of water in the sprayer from the chart below. **Escort gram tube conversion table** | | | | |
|---|---|---|---|---|
| Escort rate in grams per gallon | | | | |
| **Herbicide Rate/acre** | **Grams / 1gal** | **Grams / 2gal** | **Grams / 3gal** | **Grams / 4gal** |
| ½ oz | ¼ | ½ | ¾ | |
| 1 oz | ¼ | ½ | ¾ | 1 |
| 2 oz | ½ | 1 | 1¾ | 2¼ |

# Scotch Thistle
## *Onopordum acanthium*

**Description**: Scotch thistle is an impressive weed that can reach 8 feet in height and 6 feet in width. A thick mat of hairs give the plant a grayish appearance. The leaves can be 2 feet long and 1 foot across. Spines are present on the leaves and stems. The plant blooms in mid summer with flower heads reaching 2 inches in diameter. Flower colors range from dark pink to lavender. Although it is typically a biennial, it can sometimes grow as an annual. A rosette (up to 12 inches across) is produced the first year with a 12 inch fleshy tap root. The plant bolts early in its second year. Up to 40,000 seeds can be produced on a single plant. They are dispersed by wind, water, humans, livestock and wildlife.

**Habitat**: Scotch thistle prefers light, well-drained sandy or stony soils. It is found in areas with dry summers. Infestations can be found in areas ranging from wet meadows and pastures to sagebrush communities. This weed is associated with waste places, riparian areas, dry pastures, fields, and rangelands.

**Mechanical**: Small infestations can be eradicated by cutting off the plant below the soil. Mowing or cutting can be productive if done just before flowering or in the early stages of flowering. However, if the plants are cut too late, the seeds will mature in the fallen seed head. Mowing or cutting too early will only delay flowering, not stop it.

**Biological:** There are no biological agents that have been released for control of this plant. However, *Larinus planus*, *Rhincyllus conicus*, and/or *Trichosirocalus horridus* may be present. Surveys are needed to confirm their presence. In Canada and Australia testing is being done on various weevils and flys.

**Cultural control:** In tests, it was found that perennial grasses, esp ryegrass, was more competitive than legume species.

**Chemical:** These chemical recommendations are for noncropland areas and are summarized from the "Pacific Northwest Weed Management Handbook – 2015". These recommendations are not intended to be a complete resource guide. Label requirements need to be followed for restrictions, concentrations, timing, and nontarget interactions. Chemical control can be effective, but must be maintained for several years to exhaust the seed bank.

**2,4-D**
**Rate:** 1.5 to 2 lb ae/A
**Time:** Spring or fall.
**Remarks:** Use fall treatments to control rosettes of these biennial weeds. Use spring treatments before flower stalk elongates. Annual treatments are needed to control seedlings. Pasture legumes are injured or eliminated at these rates.
**Caution:** Avoid drift to sensitive crops.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Phenoxy acetic acid

**aminopyralid (Milestone)**
**Rate:** 0.75 to 1.25 oz ae/A (3 to 5 fl oz/A Milestone)
**Time:** Apply in spring or early summer to rosettes or bolting plants or in fall to seedlings and rosettes.
**Remarks:** A nonionic surfactant at 1 to 2 quarts per 100 gal of spray enhances control under adverse environmental conditions.
**Caution:** Do not allow drift to desirable vegetation. Many forbs (desirable broadleaf plants) can be seriously injured or killed. Do not exceed 7 fl oz/A Milestone per year.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**chlorsulfuron (Telar)**
**Rate:** 0.75 oz ai/A (1 oz/A)
**Time:** Apply to young, actively growing weeds.
**Remarks:** Do not apply to frozen ground. Maintain constant agitation while mixing product with water. Add 0.25% by volume of nonionic surfactant to spray mixture.
**Caution:** Avoid contact with sensitive crops. Do not treat powdery, dry soils and light, sandy soils if rain is not likely after treatment. Labeled for use on pasture, range, Conservation Reserve Program (CRP), and non-cropland only.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Sulfonylurea

**clopyralid + 2,4-D amine (Curtail)**
**Rate:** 1 to 5 quarts/A Curtail
**Time:** Apply to actively growing thistle after most basal leaves emerge but before bud stage.
**Remarks:** Lower rate for in-crop cereal grain application, higher rates for fallow, postharvest, and Conservation Reserve Program (CRP) applications. Consult label for specific directions. With CRP applications, for established grass only. For best results, wait at least 20 days after application before disturbing treated areas (cultivation, mowing, fertilization with shank-type applicators) to allow thorough translocation. Apply in enough total spray volume to ensure good coverage.
**Caution:** See label for crop rotation restrictions before use. Several crops may be injured up to 4 years after application.
**Site of action:** (both) Group 4: synthetic auxin
**Chemical family:** (clopyralid) pyridine; (2,4-D) phenoxy acetic acid

**clopyralid (Stinger or Transline)**
**Rate:** 0.09 to 0.375 lb ae/A (0.25 to 1 pint/A). Labeled rates vary with crops.
**Time:** Up to the bud stage of thistles.
**Remarks:** Best if applied to actively growing weeds. See labels for registered sites.

**Caution:** Consult label for crop rotation restrictions before using these products. Several crops may be injured up to 4 years after application.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**dicamba (Banvel, Rifle, or Clarity)**
**Rate:** 0.5 to 1 lb ae/A
**Time:** Apply before flower stalk lengthens on established plants and for seedling control. Spray fall applications to control rosettes.
**Remarks:** Repeat applications for several years to control new seedlings.
**Caution:** Dicamba residues may be in soil for 12 to 18 months after applying. Grass tolerates dicamba at these rates.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Benzoic acid

**glyphosate + 2,4-D (Campaign)**
**Rate:** Broadcast: 16 to 32 fl oz/A. Spot treatment: 1 to 2% solution.
**Time:** Apply to thistles in rosette stage of growth in spring or before freeze-up in fall.
**Remarks:** This product is recommended for musk thistle control in rangeland, pasture, and non-croplands and for the control of those weeds listed on the product label.
**Caution:** Do not graze lactating dairy animals on treated grass within 7 days after application. Animals being finished for slaughter and grazing in the treated area within 30 days of treatment must be removed from the treated area 3 days before slaughter. Do not cut forage for hay within 30 days of application. No grazing restriction if product is used for spot treatments in less than 10% of the total grazed area.
**Site of action:** (glyphosate) Group 9: inhibits EPSP synthase; (2,4-D) Group 4: synthetic auxin
**Chemical family:** (glyphosate) none generally accepted; (2,4-D) phenoxy acetic acid

**metsulfuron (Escort and others)**
**Rate Escort:** 0.6 oz ai/A (1 oz/A)
**Time:** Apply postemergence to actively growing plants.
**Remarks:** Using a nonionic or silicone surfactant increases effectiveness. Certain biotypes of musk and Scotch thistle are more sensitive than others to metsulfuron. Application sites differ between products; consult labels.
**Caution:** Apply only to pasture, rangeland, and non-crop sites.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Sulfonylurea

**picloram (Tordon)**
**Rate:** 0.25 lb ae/A
**Time:** Apply in the fall before thistle bolts.
**Remarks:** Do not use on diversified cropland. Follow-up applications will be necessary to control new seedlings and escaped plants.
**Caution:** Most formulations are restricted-use herbicides. Soil residuals may last over 1 years after a 0.25 lb ai/A application. Do not contaminate water. Potatoes, beans, and many other broadleaf crops are sensitive to picloram. Do not use in diversified cropping areas.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**Distribution**: Scotch thistle is found throughout Asotin County.

**ACNWCB Policy:** Scotch thistle is controlled on a complaint basis by adjoining neighbors. If the infestation site exceeds one acre in size, then it is required to be controlled.

---

# Houndstongue
## *Cynoglossum officinale*


**Description:** Houndstongue may be an annual, biennial or short-lived perennial depending upon environmental conditions. The rosette leaves are hairy, linear and resemble a hound's tongue. The erect stem leaves are hairy, alternate and may be 4-12 inches in length. The tap root is thick and woody. The reddish-purple flowers grow in a "scorpion tail" inflorescence. Flowering occurs in early summer. Reproduction is by seed. The seeds disperse by attaching to animal hair and clothing. It can produce up to 2,000 seeds per plant. Houndstongue contains pyrrolizidine alkaloids which can be fatal to livestock. Animals usually avoid it when other pasture is available. If bailed in hay, it still retains its toxic properties.

**Habitat:** Houndstongue grows in areas of hot, dry summers and cold winters. It is well adapted to coarse alkaline soils as well as clay soils. It is shade tolerant and may grow in open coniferous forests. It also does well in wetter grasslands. It can be found in pastures and other disturbed habitats. It can grow up to 9,000 feet in elevation.

**Mechanical:** Digging below the root crown will kill the plants. Clipping flowering stocks, prior to flowering, will control seed production. Cultivation in early spring gives good control. Mowing prior to flowering effectively controls seed production.

**Biological:** A root weevil, *Mogulones cruciger*, and a root beetle, *Longitarsus quadriguttatus*, have both been released in British Columbia. *Mogulones* is reportedly causing noticeable declines in houndstongue populations. The *Longitarsus* populations have been slower to build. These two biocontrols have not been released in the United States because of concerns

by U.S. Fish and Wildlife service about the possible impacts that they may have on an endangered plant species in Texas.

**Cultural control:** It has a low palatability. However, it becomes more palatable when dried and is baled in hay. It contains pyrrolizidine alkaloids which are fatal. Cattle and horses have died from eating it. Wildlife poisonings are unknown.

**Chemical:** These chemical recommendations are for noncropland areas and are summarized from the "Pacific Northwest Weed Management Handbook – ". These recommendations are not intended to be a complete resource guide. Label requirements need to be followed for restrictions, concentrations, timing, and nontarget interactions. Chemical control can be effective, but must be maintained for several years to exhaust the seed bank.

**2,4-D LV ester**
**Rate:** 2 lb ae/A
**Time:** Early spring to actively growing plants before they bloom.
**Remarks:** Sticky seeds can contaminate wool. Mowing before seed production helps alleviate wool contamination.
**Caution:** Avoid drift to sensitive crops.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Phenoxy acetic acid

**imazapic (Plateau)**
**Rate:** 0.125 to 0.188 lb/A
**Time:** Apply to actively growing plants.
**Remarks:** Use lower rates if rosettes are small; increase rate if rosettes are large or bolting. Selective to most native grasses. Higher rates may suppress seed of some cool-season grasses.
**Caution:** Before using, note crop rotation restrictions.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Imidazolinone

**metsulfuron (Escort and others)**
**Rate:** Escort: 0.6 oz ai/A (1 oz/A)
**Time:** Any time plants are growing well.
**Remarks:** Application sites differ between products; see labels.
**Caution:** Apply only to pasture, rangeland, and non-crop sites.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Sulfonylurea

**picloram (Tordon)**
**Rate:** 0.5 lb ae/A
**Time:** Any time plants are growing well.
**Remarks:** Reported to give fair to good control.
**Caution:** Most formulations are restricted-use herbicides.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**Distribution:** Houndstongue is scattered throughout Asotin County from 800' to 4,500'. It grows in a wide variety of habitats from shaded forests to dry brushy draws to damp riparian areas.

**ACNWCB Policy:** In Asotin County, houndstongue is controlled on a complaint basis when the complainant is an adjoining neighbor. If the site exceeds one acre in size, then it is required to be controlled.

---

# Sulfur Cinquefoil

## *Potentilla recta L.*


**Description**: This member of the rose family is a perennial species with a woody rootstock. There are presently studies underway to age this plant by the growth rings on the root. The leafy, hairy stems can reach one to three feet in height. The palmate leaves can have 5 to 7 toothed leaflets. The plant is spread primarily by seeds attaching to animals. Because of its high tannin content, it has low grazing palatability.

**This species is easily confused with native species of cinquefoil.**

1. The native species are a greener color – sulfur cinquefoil looks yellowish-green.
2. The native species have mostly basal leaves – sulfur cinquefoil has numerous stem leaves.
3. The native species look silvery on the back of the leaves – sulfur cinquefoil looks yellowish-green.
4. The native species flowers are yellow – sulfur cinquefoil flowers are cream colored.
5. The native species has about 20 stamens – sulfur cinquefoil has 25 or more stamens

**Habitat:** Sulfur cinquefoil can be found in a wide variety of environmental conditions. Although somewhat sensitive to shade, it can be found in open forest and logged areas, grasslands, shrubby areas, roadsides, waste areas, and abandoned fields.

**Mechanical:** Annual cultivation will control sulfur cinquefoil. Chopping and hand pulling has been effective if the root crown is removed. Because of the large root mass, mowing has not been effective.

**Biological:** Because of the close relationship between sulfur cinquefoil, strawberries and native cinquefoils, there is concern that biocontrol agents may attack nontarget plants. A root moth and seed head weevil are currently being studied, but releases are still ten years, or more, away.

**Fire:** Early spring fires may favor native species over sulfur cinquefoil. However, fall fires have been shown to benefit sulfur cinquefoil over the native species. Fire intensity plays a large part in survival of plant parts.

**Cultural control:** Whenever cattle are pastured in areas with sulfur cinquefoil, there is danger that they will carry the seeds to uninfected areas. Goats are the only known animals that will select for sulfur cinquefoil.

**Chemical:** These chemical recommendations are for noncropland areas and are summarized from the "Pacific Northwest Weed Management Handbook – ". These recommendations are not intended to be a complete resource guide. Label requirements need to be followed for restrictions, concentrations, timing, and nontarget interactions. Chemical control can be effective, but must be maintained for several years to exhaust the seed bank.
Please contact the Weed Office for updated information on herbicide controls.

**Distribution:** Any areas in Asotin County that have Ponderosa pine trees also have a high risk of having sulfur cinquefoil. Cinquefoil has also been found on north facing slopes and deep draws.

**ACNWCB Policy:** If the infestation site exceeds one acre in size, then it is required to be controlled.

---

# Rush Skeletonweed

## *Chondrilla juncea L.*

**Description:** Rush skeletonweed is a member of the sunflower family. It ranges in height from 1 to 4 feet. It has an extensive root system including a tap root that can reach 8 or more feet in depth. Skeletonweed over-winters as a basal rosette that closely resembles a dandelion. The mature plant is a nearly leafless stem with ½" yellow flowers growing in the leaf axils or at the branch tips. Large plants can produce up to 1,500 flower heads with 20,000 seeds. Each seed has its own pappus, which can carry on wind currents up to 20 miles. The plant produces a white latex when cut.

Although there are hundreds of biotypes (differentiated by leaf, height, & flower characteristics), only three are found in the Pacific Northwest. These biotypes (Spokane, Post Falls, Banks) differ in height, flowering time, and reactions to herbicides and biocontrols.

**Habitat:** Rush skeletonweed prefers sandy to gravely soils in well drained areas, but will grow in shallow soil situations. It can grow in areas that vary in precipitation from 10 to 40 inches per year. It survives in regions that receive little or no frost to areas that have subzero winter temperatures. In Asotin County, areas of highest risk are road sides and old flood plains.

**Mechanical:** Mechanical injury to the roots stimulates shoot development from any of the lateral or main roots. Once established in crop lands, cultivation is the major factor in the spread of this weed. Less than ½ inch root fragment can produce a new plant. Root fragments are viable until they dry out. The wiry stems and the latex sap gum up harvesting equipment. In Australia, where this weed is wide spread, wheat production has been reduced up to 80% with whole fields being converted to rangeland. Small infestations can be pulled by hand if done 3 to 4 times a year for 5 years or more.

**Biological:** There are two biocontrols present in Asotin County. The gall mite (*Eriophyes chondrillae*) is present on most populations. It is easy to identify since it appears to be a cancerous type of growth on the stems. An infestation of the mites reduces root carbohydrate reserves, hinders rosette formation, stunts growth, decreases or can completely prevent seed production, and can kill first year plants. In Asotin County the results are inconsistent. The gall midge (*Cystiphora schmidti*) is also present. Purple bloctches on the leaves and stems indicate the presence of these midges. The midges damage the leaf and stem tissues, causing premature yellowing, and desiccation. Rosettes may actually die and seeds have reduced viability. There is a native wasp that preys on the midge and has limited its success. A new root moth (*Bradyrrhoa gilveolella*) has had good success in Montana. The larvae actually kill the plants through destruction of the root tissue. Nez Perce Biocontrol Center in Lapwai and University of Idaho are attempting to establish the moth in this area.

**Fire:** Unknown

**Cultural Control:** Cows, horses, and deer will graze skeletonweed. Continual grazing can stop seed production. However, rotational grazing has been shown to increase plant density. Studies have shown that using both competitive beneficial forage and biocontrols in combination results in some measurable control.

**Fertilizer:** Nitrogen fertilizer will increase the competitiveness of beneficial plants and reduce the density of skeletonweed, although the size of the individual plants increases.

**Chemical:** These chemical recommendations are for noncropland areas and are summarized from the "Pacific Northwest Weed Management Handbook – 2003". These recommendations are not intended to be a complete resource guide. Label requirements need to be followed for restrictions, concentrations, timing, and nontarget interactions. Chemical control can be effective, but must be maintained for several years to exhaust the seed bank. Skeletonweed is considered tolerant to herbicides. The different biotypes of the weed respond differently to the same herbicides. Herbicide control requires an aggressive follow-up program with repeated applications. Application of residual herbicides are most successful

when applied between the time in the late fall (after the first frost) and before bolting in the spring. Spring applications of 2,4-D will suppress growth for the year, but will not kill the plant.

**2,4-D or MCPA**
**Rate:** 2 lb ae/A
**Time:** Apply to rosettes in the spring immediately before or during bolting.
**Remarks:** 2,4-D inhibits further aboveground growth but will not prevent new plant development from root buds.
**Caution:** Re-treatment is important.
**Site of action:** (both) Group 4: synthetic auxin
**Chemical family:** (both) phenoxy acetic acid

**aminocyclopyrachlor + chlorsulfuron (Perspective)**
**Rate:** 1.8 to 3.2 oz/A aminocyclopyrachlor + 0.7 to 1.3 oz/A chlorsulfuron (4.5 to 8 oz/A of product)
**Time:** Apply to actively growing plants in spring.
**Remarks:** Adjuvants can be used; these include methylated seed oils 0.5 to 1% v/v, nonionic surfactants at 0.25 to 1% v/v, and crop oil concentrates at 1% v/v. Can be applied using an invert emulsion rather than water.
**Caution:** Even low rates can kill nontarget tree and shrub species, so avoid application within a distance equal to the tree height of the sensitive species. Do not allow spray to drift off target. Can injure several grass species including bromes, as well as basin wildrye.
**Site of action:** Group 4 synthetic auxin (aminocyclopyrachlor) Group 2: ALS inhibitor (chlorsulfuron)
**Chemical family:** Phenoxy acetic acid (aminocyclopyrachlor); sulfonylurea (chlorsulfuron)

**aminopyralid (Milestone)**
**Rate:** 1.75 oz ae/A (7 fl oz/A Milestone)
**Time:** Spring or fall when rosettes are present.
**Remarks:** A nonionic surfactant at 1 to 2 quarts per 100 gal of spray enhances control under adverse environmental conditions.
**Caution:** Do not allow drift to desirable vegetation. Many forbs (desirable broadleaf plants) can be seriously injured or killed. Do not exceed 7 fl oz/A Milestone per year.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**clopyralid (Transline or Stinger)**
**Rate:** 0.25 to 0.375 lb ae/A (0.66 to 1 pint/A)
**Time:** Apply to rosette in fall or up to early bolting in spring.
**Remarks:** Consult labels for specific site registrations.
**Caution:** Product will injure or kill sensitive broadleaf forages. Consult label for crop rotation restrictions before using. Several crops may be injured several years after application.
**Site of action** Group 4: synthetic auxin
**Chemical family** Pyridine

**picloram (Tordon)**
**Rate:** 1 lb ae/A
**Time:** Apply from late fall to early spring. For best results, apply just before or during bolting.

**Remarks:** Rush skeletonweed can reduce crop yields by as much as 70%, so it is important to treat small infestations. Picloram is the most effective treatment available. Re-treatment is necessary.
**Caution: Most formulations are restricted-use herbicides**. Do not contaminate water. Potatoes, beans, and many other broadleaf crops are sensitive to picloram; do not use in diversified crop areas.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**Distribution:** There are small scattered populations throughout Asotin County.

**ACNWCB Policy:** This species is required to be controlled throughout Asotin County.

---

# Common Teasel
## *Dipsacus fullonum L*


**Description:** Common teasel, also called Fuller's teasel, is a tall, somewhat spiny, short-lived perennial or biennial. The distinctive seed heads are popular in floral arrangements. Originally from Europe and northern Africa, common teasel was first introduced to North America in the 1700's.
For one or more years the teasel plants form low growing rosettes before bolting. The mature plants may grow to 6 ½ feet in height. The flowers are light purple growing in bands around the spiny cone-like heads. The cones occur singly on top of the prickly stems. The subtending bracts curve around the heads forming a 'cage'.
The basal leaves are distinctly wrinkled with a pale midvein and scalloped edges. The long pointed stem leaves are opposite and prickly.

**Habitat:** Teasel prefers moderately moist soil but tolerates both dry and wet conditions. It grows on roadsides, creeks, fields, and pastures. It can form large dense stands and is very competitive in open grassy habitats. It can outcompete native grass species in some areas.

**Mechanical:** Mechanical control is also effective if done correctly. Once the flowering stalks form, wait until the flowers start to appear and then cut the plants at or right below ground level with a machete or sharp shovel.

**Biological:** none

**Fire:** unknown

**Cultural control:** Mowing is not as effective because plants can re-grow from the root crown if they are cut too high. If a mower is used, set it as low as possible and check back for any re-sprouting plants. Teasel plants that are knocked over by the mower or cut too high will probably be able to re-grow and set seed. Also, it is best to remove the flower heads and dispose of them because immature heads have been known to set seed if they are left on the ground.

**Chemical:** These chemical recommendations are for noncropland areas and are summarized from the "Pacific Northwest Weed Management Handbook –2015". These recommendations are not intended to be a complete resource guide. Label requirements need to be followed for restrictions, concentrations, timing, and nontarget interactions. Chemical control can be effective, but must be maintained for several years to exhaust the seed bank.

**2,4-D amine**
**Rate:** 1 lb ae/A
**Time:** Apply to rosette stage in fall or spring.
**Remarks:** Treating after teasel begins to bolt may not be effective.
**Caution:** Avoid drift to sensitive crops.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Phenoxy acetic acid

**2,4-D amine + dicamba (Banvel, Rifle, or Clarity)**
**Rate:** 0.75 lb ae/A 2,4-D + 0.125 lb ae/A dicamba
**Time:** Apply to rosette stage in fall or spring.
**Remarks:** Treatments made after teasel begins to bolt may not be effective.
**Caution:** Avoid drift to sensitive crops.
**Site of action:** (both) Group 4: synthetic auxin
**Chemical family:** (2,4-D) phenoxy acetic acid; (dicamba) benzoic acid

**chlorsulfuron (Telar)**
**Rate:** 0.75 oz ai/A (1 oz/A Telar)
**Time:** For best results, apply to actively growing teasel in the rosette stage.
**Remarks:** Constantly agitate while mixing and spraying. Add 0.25% v/v nonionic surfactant to spray mixture. Apply with ground equipment in at least 10 gal/A carrier.
**Caution:** Registered for use on pasture, range, Conservation Reserve Program (CRP), and non-cropland only. Avoid contact with sensitive crops. Can persist in soil. Do not treat powdery, dry soils or light, sandy soils unless rain is likely soon after treatment. Do not apply to frozen ground.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Sulfonylurea

**imazapic (Plateau)**
**Rate:** 0.125 to 0.188 lb ai/A
**Time:** Apply to rosettes.
**Remarks:** Add 1 quart/A methylated seed oil.
**Caution:** Before using, note crop rotation restrictions.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Imidazolinone

**metsulfuron (Escort and others)**
**Rate:** Escort: 0.45 oz ai/A (0.75 oz/A)
**Time:** Apply to actively growing plants.
**Remarks:** Using a nonionic or silicone surfactant increases effectiveness. Application sites differ among products; consult labels.
**Caution:** Apply only to pasture, rangeland, and non-crop sites.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Sulfonylurea

**Recommended treatment:** Teasel is not difficult to kill if treated with herbicides as a rosette. Since it is often found adjacent to water bodies, Chaparral is the easiest herbicide to use.

**Distribution:** Scattered throughout Asotin County. In riparian communities and wet areas at lower elevations and in pastures and open grassy areas at higher elevations.

**ACNWCB Policy:** Controlled on a complaint basis by adjoining neighbors and/or in selected areas.

---

# Common Mullein
## *Verbascum Thapsus*

**Description:** Common mullein is a densely woolly, sturdy biennial that may reach more than 6 feet tall in its flowering year. Depending upon growing conditions, mullein may flower in the first, second or third year. A basal rosette of large furry leaves and a substantial crown are

produced in the first year. In the second year, common mullein typically produces a single, stout flowering stem. One or more erect branches near the base of the inflorescence are normal. Basal leaves are simple, measure 3 to 20 inches long, and may be persistent. Stem leaves are alternate, and their size is reduced toward the inflorescence the thick coating of branched hairs on the stems and leaves breaks the force of surface winds and prevents water loss to evaporation. The small yellow flowers are densely arranged on a spike-like inflorescence. Flowers are short-lived. They are open to pollination for 1 day from just before dawn to midafternoon. A single plant may produce up to ¼ million seeds. Some seeds have retained viability after 100 years.

**Habitat:** Given a seed source and a canopy opening, common mullein is a potential inhabitant of nearly any vegetation or community type. It has been described in meadows, prairies, desert shrublands, chaparral, deciduous woodlands, and coniferous forests throughout North America

**Mechanical:** Perhaps the most effective method of controlling common mullein is to cut plants with a weed hoe. Plants will not resprout if cut through the root crown below the lowest leaves. Mowing appears to be ineffective.

**Biological:** No insects or diseases have been approved for introduction as biological control agents

**Cultural control:** Grazing animals generally will not eat mullein because of its hairy leaves

**Chemical:** Spraying the center of the rosette before the plant has bolted, gives better results than only spraying the leaves.

**metsulfuron (Escort and others)**
**Rate:** Escort: 0.45 oz ai/A (0.75 oz/A)
**Time:** Apply to actively growing plants.
**Remarks:** Using a nonionic or silicone surfactant increases effectiveness. Application sites differ among products; consult labels.
**Caution:** Apply only to pasture, rangeland, and non-crop sites.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Sulfonylurea

**Glyphosate**
**Rate:** 1.2 to 2.25 lb ae/A
**Time:** Apply to actively growing plants at early heading or in fall from mid-September to after first light frost.
**Remarks:** Check label regarding using a surfactant.
**Caution:** Glyphosate controls other vegetation in the treated area.
**Site of action:** Group 9: inhibits EPSP synthase
**Chemical family:** None generally accepted

**Recommended treatment:** Herbicide application as a rosette.

**Distribution:** Scattered throughout Asotin County.

**ACNWCB Policy:** Mullein is not a listed noxious weed

# White Bryony
## *Byonia alba*


**Description:** Bryony is a vigorous perennial vine resembling Kudzu in its habit--forming dense mats which shade out all vegetation it grows upon. Major destructive potential to native vegetation, forest communities, and urban horticulture. Berries are toxic to humans. White bryony is an herbaceous perennial vine with climbing stems that grow 12 feet long, or more. It has thick, fleshy, light yellow roots. Stems have long curling, not branched tendrils and the flowers are from leaf axils. It is monoecious, separate male and female flowers are found on the same plant. Flowers are greenish-white and up to 0.5 inch across. Leaves are simple, triangular, alternate, broadly toothed and 3 to 5 lobed. The upper and lower surfaces have small white glands. White bryony stems are vines that can grow over and blanket other plants. It has black mature berries with 3 to 6 ovoid to oblong seeds in each one. The berries are especially poisonous (though all parts of the plant are).

**Habitat:** Any place where birds may sit: brushy riparian sites, fence rows, rock piles, brushy draws

**Mechanical:** The vines easily dislodge from the roots. If possible follow the vine to the root and cut off the top 2-3" of the root. In small infestations, in order to stop seed spread, when the berries are still green, vines may be pulled from the surrounding brush and pulled free of the roots.

**Biological:** none

**Fire:** unknown

**Cultural control:** Because of the difficult terrain that white bryony tends to be found, mowing and cultivation are not practical.

**Chemical:** Glyphosate works well but kills underlying vegetation. Franklin County is using transline as an experimental herbicide to try and limit damage to brush species.

**Recommended treatment:** Since I only found one small infestation, I would be sure to stop seed spread by mechanical means, then return in the spring for an herbicide application.

**Distribution:** It occurs as a climber in trees and fence rows and when disseminated in an area where there is nothing to climb, it will form dense mats shading out all other vegetation. It grows in disturbed areas, riparian areas, and roadsides. It is scattered throughout Asotin County.

**ACNWCB Policy:**
**Thanks to:** Washington State Noxious Weed Control Board

---

# Common Burdock
## *Arctium minus*


**Description:** Common burdock is a biennial weed that reproduces by seed. Seedlings emerge in early spring. The first year's growth produces a large rosette of broadly triangular or oval, bluntly pointed leaves. They are coarsely veined, 6 to 18 inches (15 to 45 cm) long and up to 10 inches (25 cm) wide. The upper surface is smooth to sparsely hairy and dull, dark green. The lower surface is light green and has a woolly texture. The leaves are round-lobed at the base, and the margins are wavy or occasionally coarsely toothed. The rosette leaves die back in winter, but the root crown remains alive to send up new leaves the following spring. The second-year rosette has a bushier form, and its leaves are rarely longer than 9 inches a branched flower stalk emerges from the center of the rosette. Usually fully extended by late June, the stalk grows 2 to 5 feet ( 60 to 150 cm) tall and bears alternate leaves similar to those of the rosette, but about half the size.
The burs that form on this stalk are actually composite flowers that bloom in late spring to midsummer. Several to many flower heads cluster in the leaf axils of the long central stalk. Heads are nearly round, 3/8 to ¾ inch (1 to 2 cm) across, and are topped with a corolla of rose-purple, petal-like flowers. Slender hooked bracts surround the corolla and become dry and stiff as the bur ripens.

**Habitat:** riparian areas

**Mechanical:** Digging up most of the taproot will kill the plant

**Biological:** none

**Fire:** unknown

**Cultural control:** Plowing or disking works very well, but impractical for most locations in Asotin County.

**Chemical:**

**2,4-D LV ester or 2,4-D amine**
**Rate:** 2 lb ae/A
**Time:** Before flower buds develop.
**Remarks:** Plants should be actively growing at time of treatment.
**Caution:** Avoid drift to sensitive crops.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Phenoxy acetic acid

**aminopyralid (Milestone)**
**Rate:** 1 to 1.5 oz ae/A (4 to 6 fl oz/A Milestone)
**Time:** Apply to actively growing plants in the rosette.
**Remarks:** A nonionic surfactant at 1 to 2 quarts per 100 gal of spray enhances control under adverse environmental conditions.
**Caution:** Do not allow drift to desirable vegetation. Many forbs (desirable broadleaf plants) can be seriously injured or killed. Do not exceed 7 fl oz/A Milestone per year.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**Recommended treatment:** Chaparral

**Distribution:** Scattered in every riparian area in Asotin County

**ACNWCB Policy:** Although this is not a State listed noxious weed the Weed Board recommends treating it whenever you are in the area treating different weed species. It occupies productive, moist soils and is an irritant to livestock and wildlife.

**Thanks to:**
Penn State Extension Service
PNW Weed Management Handbook

---

# Field Bindweed
## *Convolvulus arvensis*


**Description:** Field bindweed is a mat forming or climbing perennial with stems up to four feet in length. The leaves are alternate with an arrow-head shape. The trumpet-shaped flowers range in color from pink to white. This weed flowers from June until first frost. It reproduces by seeds and rhizomes. The seeds may live for 50 years.

**Habitat:** Field bindweed can adapt to a wide range of environmental conditions. It has been found as high as the 10,000 foot level. It prefers fertile soils that can be either dry or moist. It can be found in cultivated fields, orchards, stream banks, and waste places.

Because field bindweed is widely distributed and has a significant history of causing economic problems for the agricultural industry, it has been called, one of the ten 'world's worst weeds'. The extent of damage to natural areas is not clear. Field bindweed utilizes nutrients that other desirable species could use and has been shown to reduce moisture in the top 2 ½ inches of soil.

New infestations of bindweed are primarily by seed. Seeds are transported by water, birds, animals, humans, and machinery. Seeds can pass through killdeer, quail, ducks, geese, yellowlegs, jays, ravens, mocking birds, and starlings and remain viable.

When working on a management plan for bindweed it is important to realize the extent of the below ground root system that needs to be depleted before the infestation is controlled. The above ground vegetation will regenerate and replace the root carbohydrates without careful monitoring. A multi year approach is necessary.

**Mechanical:** Hoeing or hand-pulling may encourage the germination of dormant seeds or encourage vegetative growth by breaking up root fragments. Mowing has not been successful because plants can be missed and it promotes ground-hugging growth. Repeated cultivation is required for field bindweed control because plants can regenerate from roots as deep as 5 feet. Studies have shown that bindweed needs to be cultivated every 4 to 14 days to achieve control.

**Biological:** Two gall mites, *Aceria malherbae* and *A. convolvuli*, have been introduced to control field bindweed. Their establishment in SE Washington is unknown.

**Fire:** Unknown

**Cultural control:** Some control of field bindweed has been achieved by planting a heavy over-story vegetation (sorghum, alfalfa, or millet) that reduces light to the weed. Grazing has only had temporary effects upon bindweed populations. Hogs and cattle get a negative reaction from grazing it. Sheep only eat it reluctantly.

**Fertilizer:** Unknown

**Chemical:** These chemical recommendations are for noncropland areas and are summarized from the "Pacific Northwest Weed Management Handbook –2015". These recommendations are not intended to be a complete resource guide. Label requirements need to be followed for restrictions, concentrations, timing, and nontarget interactions. Chemical control can be effective, but must be maintained for several years to exhaust the seed bank.

**Dicamba (Banvel, Rifle, or Clarity) or dicamba + 2,4-D (for suppression)**
**Rate:** 0.5 to 1 lb ae/A dicamba; or 0.5 to 1 lb ae/A dicamba + 1 to 2 lb ae/A 2,4-D
**Time:** Apply during fallow, before planting and when weeds are actively growing.
**Remarks:** Rates are to suppress field bindweed.
**Caution:** Refer to label for crop rotation restrictions. Avoid drift to sensitive crops.
**Site of action:** (both) Group 4: synthetic auxin
**Chemical family:** (dicamba) benzoic acid; (2,4-D) phenoxy acetic acid

**Dicamba (Banvel, Rifle, or Clarity) or dicamba + 2,4-D (for control)**
**Rate:** 1 to 2 lb ae/A dicamba; or 1 to 2 lb ae/A dicamba + 1 to 2 lb ae/A 2,4-D
**Time:** Apply in late summer or fall before killing frost.
**Remarks:** Control is best when weeds are actively growing and in postbloom stage. Make follow-up application in spring to control seedlings.
**Caution:** See label for in-crop use and rotation restrictions. Avoid drift to sensitive crops.
**Site of action:** (both) Group 4: synthetic auxin
**Chemical family:** (dicamba) benzoic acid; (2,4-D) phenoxy acetic acid

**Glyphosate**
**Rate:** 3 to 3.75 lb ae/A
**Time:** Apply at full bloom to early seed stage of maturity. Application on fall regrowth may provide some control.
**Remarks:** Cover foliage thoroughly but avoid spray runoff. Re-treatments may be needed for complete control. Control improves if the treated area is tilled 2 to 3 weeks after treatment.
**Caution:** Glyphosate controls grasses as well as other vegetation in treated areas.
**Site of action:** Group 9: inhibits EPSP synthase
**Chemical family:** None generally accepted

**Glyphosate + 2,4-D (Landmaster BW)**
**Rate:** 0.378 to 0.67 lb ae/A (54 oz/A Landmaster)
**Time:** Apply in fallow or postharvest to bindweed runners at least 10 inches long. Use 1% solution to spot treat with high-volume, spray-to-wet applications. Tilling after treatment may improve control.
**Remarks:** In fallow, cultivate until July 1; then allow weeds to grow to treatment stage.
**Caution:** Avoid drift to sensitive crops.
**Site of action:** (glyphosate) Group 9: inhibits EPSP synthase; (2,4-D) Group 4: synthetic auxin
**Chemical family:** (glyphosate) none generally accepted; (2,4-D) phenoxy acetic acid

**Glyphosate + dicamba (Banvel, Rifle, or Clarity)**
**Rate:** 1.5 lb ae/A glyphosate + 0.5 lb ae/A dicamba
**Time:** Apply mid- to late-bloom but before seed matures. Applying to fall regrowth may give some control.
**Remarks:** Use this tank-mix during summer fallow before planting small grains.
**Caution:** Crop may be somewhat injured if dicamba is applied within 45 days of planting. Glyphosate controls grasses as well as other vegetation in treated areas.
**Site of action:** (glyphosate) Group 9: inhibits EPSP synthase; (2,4-D) Group 4: synthetic auxin
**Chemical family:** (glyphosate) none generally accepted; (dicamba) benzoic acid

**Metsulfuron (Escort)**
**Rate:** 0.6 to 1.2 oz ai/A (1 to 2 oz/A)
**Time:** Apply to actively growing bindweed in bloom stage.
**Remarks:** Treatment is suppressive. Use a nonionic or silicone surfactant to improve control.
**Caution:** Do not allow spray drift to sensitive crops. This rate is only for non-crop sites.
**Site of action:** Group 2: acetolactate synthase (ALS) inhibitor
**Chemical family:** Sulfonylurea

**Picloram (Tordon)**
**Rate:** 1 lb ae/A
**Time:** Apply in the growing season on non-cropland when bindweed is visible. Timing is not critical, but results are most consistent if bindweed is in early bud to full bloom.
**Remarks:** Apply as a coarse, low-pressure spray in sufficient volume to cover adequately. For control in fallow, refer to Winter Wheat-Nonirrigated East of the Cascades in this handbook.
**Caution: A restricted-use herbicide**. Picloram is registered only on rangeland and permanent pastures and on fallow grainland east of the Cascades. Do not contaminate water. Potatoes, beans, and many other broadleaf crops are sensitive to picloram. Do not plant these crops until an adequately sensitive bioassay or chemical test shows that no picloram is detectable in the soil. Extend treatment 10 ft beyond the infestation. Do not use in diversified cropping areas.
**Site of action:** Group 4: synthetic auxin
**Chemical family:** Pyridine

**Distribution:** Field bindweed is a common weed in Asotin County. It can be found along road ROW's, yards, rangelands, and fallow fields. The only extensive population in a natural area is that area west of Rattlenake Grade.

**ACNWCB Policy:** In Asotin County, field bindweed control is encouraged

---

# LITERATURE CITED

**Biology and Management of Noxious Rangeland Weeds**
Roger Sheley and Janet Petroff
Oregon State University Press 1997

**Pacific Northwest Weed Management Handbook**
Washington State University and University of Idaho 2004 - 2015

**Weeds of the West**
Tom Whitson
Western Society of Weed Science 2000

**Biological Control of Weeds in the West**
Western Society of Weed Science 1996

**Biological Control of Invasive Plants in the United States**
Eric Coombs, Janet Clark, Gary Piper, Alfred Cofrancesco
Oregon State University Press 2004

**King County Noxious Weed Control Board**
201 S. Jackson St suite 600
Seattle, WA 98104

**Stevens County Noxious Weed Control Board**
230 Williams Lake Rd
Colville, WA 99114

**Invasive Plants of California's Wildlands**
C. C., J.M. Randall, and M. C. Hoshovsky.
University of California Press. Berkeley, CA

**Harvey County Weed Board, Oregon**
450 N Buena Vista Ave. #10
Burns, OR 97720