

# FOREST VEGETATION MANAGEMENT USING SHEEP – SPECIES PALATABILITY TABLES FOR SHEEP<sup>1</sup>

COMMON NAME	SCIENTIFIC NAME	PREFERENCE ORDER	COMMENTS
<b>FERNS</b>			
Bracken fern	<i>Pteridium aquilinum</i>	Nil	<ul style="list-style-type: none"> <li>• Can be a problem to horses but not recorded affecting sheep.</li> <li>• Will not graze unless in the early frond stage but the mature plant can be controlled by trampling.</li> </ul>
Broad spinulose shield fern	<i>Dryopteris assimilis</i>	Nil	<ul style="list-style-type: none"> <li>• Can trample ferns effectively without harming the conifer plantation if slowly and professionally herded.</li> </ul>
Lady fern	<i>Athyrium filix-femina</i>	Nil	<ul style="list-style-type: none"> <li>• Can trample ferns effectively without harming the conifer plantation if slowly and professionally herded.</li> </ul>
Oak fern	<i>Gymnocarpium dryopteris</i>	Nil	<ul style="list-style-type: none"> <li>• Can trample ferns effectively without harming the conifer plantation if slowly and professionally herded.</li> </ul>
<b>GRASS AND HERB SPECIES</b>			
American vetch	<i>Vicia americana</i>	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• Rarely a competitor on its own.</li> </ul>
Bluejoint	<i>Calamagrostis canadensis</i>	1 <sup>st</sup> –3 <sup>rd</sup>	<ul style="list-style-type: none"> <li>• Fresh stems and leaves are highly palatable. Becomes coarse and less palatable as it matures.</li> <li>• Withstands heavy grazing due to tenacious rhizomes.</li> <li>• Crude protein medium, crude fibre high during growing season.</li> </ul>
Cow parsnip	<i>Heracleum lanatum</i>	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• Does not withstand heavy grazing.</li> </ul>
Fireweed	<i>Epilobium angustifolium</i>	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• Highly palatable. Contains high protein levels (19%) before maturity.</li> <li>• After flowering, stalks turn woody and are not eaten. After seed-set, sheep may refuse leaves.</li> </ul>
Forest wheatgrasses	<i>Agropyron</i> spp.	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• Will disappear through repeated grazing.</li> <li>• Plants remain green and succulent late into the summer.</li> </ul>
Hawkweed	<i>Hieracium</i> spp.	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• Disappears quickly with repeated grazing.</li> </ul>
Peavine	<i>Lathyrus</i> spp.	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• High protein levels until it starts to cure. • Preferred forage plant.</li> </ul>
Pinegrass	<i>Calamagrostis rubescens</i>	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• Plant vigour decreases rapidly when grazed twice per season.</li> <li>• Protein levels and palatability decrease rapidly at maturity. A high priority for spring grazing.</li> </ul>
Showy aster	<i>Aster conspicuus</i>	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• Does not stand up to heavy grazing. • Rarely a competitor on its own.</li> </ul>
Sitka valerian	<i>Valeriana sitchensis</i>	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• Very high sheep preference. • Plant vigour is reduced with 2 years of single-pass grazing.</li> </ul>
Western fescue	<i>Festuca occidentalis</i>	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>• Will disappear with repeated grazing.</li> </ul>

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<b>GRASS AND LEGUME MIXES</b> (These are examples of low-growing species from which mixes can be prepared.)			
Birds-foot trefoil	<i>Lotus corniculatus</i>	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>The commonly used grass and legume mixes are more resistant to repeated grazing than are most shrub and herb species.</li> <li>Livestock grazing combined with sowing low growing forages can replace taller vegetation, such as fireweed, that restrict light to young conifers.</li> <li>Sheep prefer grass and legume mixes to native species, so a higher volume of overall vegetation removal occurs before the flock becomes interested in flushing conifer terminal buds and leaders.</li> </ul>
Bluegrass	<i>Poa</i> spp.		
Colonial bentgrass	<i>Agrostis capillaris</i>		
Fescue	<i>Festuca</i> spp.		
White clover	<i>Trifolium repens</i>		

### Aerial or ground seeding of grass and legume mixes

- Important to select low-growing grass and legume mixes. Seed the spring after site preparation to produce a cover to compete with the natural seeding-in of native herb, grass and shrub competitors. The usual sequence is soil disturbance or broadcast burning, spring seeding, planting, and grazing the following year.
- Trials in Oregon show that grass and legume seeding reduces sheep damage to flushing Douglas-fir terminals (broadcast burned 2 years earlier).

### SHRUB SPECIES

Beaked hazelnut	<i>Corylus cornuta</i>	1 <sup>st</sup> –2 <sup>nd</sup>	<ul style="list-style-type: none"> <li>Not always grazed in the 1<sup>st</sup> pass.</li> <li>Usually found at low volumes.</li> </ul>
Bigleaf maple	<i>Acer macrophyllum</i>	1 <sup>st</sup>	<ul style="list-style-type: none"> <li>Studies in Oregon recommend maple and other deciduous plantings be protected from sheep grazing.</li> </ul>
Black cottonwood	<i>Populus balsamifera</i>	2 <sup>nd</sup>	<ul style="list-style-type: none"> <li>Cottonwood cannot withstand continued grazing. Heavy mortality occurs with 2 years of grazing.</li> </ul>
Black twinberry	<i>Lonicera involucrata</i>	2 <sup>nd</sup> –3 <sup>rd</sup>	<ul style="list-style-type: none"> <li>Sheep will graze young shoots. Ineffective control of mature plant communities.</li> </ul>
Blueberry	<i>Vaccinium</i> spp.	2 <sup>nd</sup>	<ul style="list-style-type: none"> <li>Difficult to graze due to many small leaves.</li> <li>Rarely a major competitor with conifers on its own.</li> </ul>
Devil's club	<i>Oplopanax horridus</i>	2 <sup>nd</sup> –nil	<ul style="list-style-type: none"> <li>Capable of 80–90% leaf removal with patient herding.</li> <li>Graze leaves in May or June before spines mature and harden on the underside of the leaves.</li> </ul>
Douglas maple	<i>Acer glabrum</i>	1 <sup>st</sup> –2 <sup>nd</sup>	<ul style="list-style-type: none"> <li>Will be grazed in the first pass when found with less palatable species.</li> </ul>
Paper birch	<i>Betula papyrifera</i>	2 <sup>nd</sup>	<ul style="list-style-type: none"> <li>Sheep will also graze bog birch (<i>Betula glandulosa</i>).</li> </ul>
Raspberry	<i>Rubus</i> spp.	2 <sup>nd</sup> –3 <sup>rd</sup>	<ul style="list-style-type: none"> <li>Palatability declines as plants mature.</li> <li>Densities may be reduced with 2 years of single-pass grazing.</li> </ul>
Red alder	<i>Alnus rubra</i>	3 <sup>rd</sup>	<ul style="list-style-type: none"> <li>Trials in Oregon demonstrated reduction in alder with 2 years of repeated sheep grazing. Sheep attention was taken from the flushing Douglas-fir terminal leaders through grass–legume aerial seeding of sites which were broadcast burned 2 years earlier.</li> </ul>
Red elderberry	<i>Sambucus racemosa</i>	2 <sup>nd</sup>	<ul style="list-style-type: none"> <li>Can be completely grazed.</li> <li>Rarely a primary competitor. Usually occurs in isolated clumps.</li> </ul>

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<b>SHRUB SPECIES (CONTINUED)</b>			
Red-osier dogwood	<i>Cornus stolonifera</i>	2nd	<ul style="list-style-type: none"> <li>Leaves may be consumed during first passes.</li> <li>Usually encountered in low volumes.</li> </ul>
Rose	<i>Rosa</i> spp.	1st	<ul style="list-style-type: none"> <li>Rose is highly palatable. However, dense thorny stems restrict complete leaf removal.</li> </ul>
Salal	<i>Gaultheria shallon</i>	Nil	<ul style="list-style-type: none"> <li>Sheep cannot graze the leathery leaves or trample the thick stems.</li> </ul>
Salmonberry	<i>Rubus spectabilis</i>	3rd	<ul style="list-style-type: none"> <li>Can be controlled with well-managed grazing.</li> <li>Terminal nipping may occur.</li> </ul>
Sitka alder	<i>Alnus viridis</i>	2nd–3rd	<ul style="list-style-type: none"> <li>Sheep flocks must be closely managed to completely graze all alder species.</li> </ul>
Spirea	<i>Spiraea</i> spp.	2nd	<ul style="list-style-type: none"> <li>Readily grazed shrub staying high in protein until fall.</li> <li>Not often abundant on plantations.</li> </ul>
Thimbleberry	<i>Rubus parviflorus</i>	3rd	<ul style="list-style-type: none"> <li>Can be controlled with managed grazing.</li> <li>Densities may be reduced with 2 years of single-pass grazing.</li> </ul>
Trailing black currant	<i>Ribes laxiflorum</i>	3rd	<ul style="list-style-type: none"> <li>Leaf removal is complete with careful herding.</li> </ul>
Trailing blackberry	<i>Rubus urinus</i>	3rd	<ul style="list-style-type: none"> <li>Can be grazed with skillful herding techniques.</li> </ul>
Trembling aspen	<i>Populus tremuloides</i>	1st	<ul style="list-style-type: none"> <li>Excellent control achieved with 2 grazing/season over 2 years. Regraze very soon after leaf resprout.</li> <li>Palatability, protein and crude fibre levels remain high-medium throughout season.</li> <li>Sheep have traditionally removed aspen from cattle range as they more readily consume the leaves.</li> </ul>
Vine maple	<i>Acer circinatum</i>	1st–2nd	<ul style="list-style-type: none"> <li>Both interior maples will be grazed in the first pass when found with less palatable species.</li> <li>Rarely a plantation threat due to their low volume and infrequency.</li> </ul>
Willow	<i>Salix</i> spp.	2nd	<ul style="list-style-type: none"> <li>Most palatable of the brush species.</li> <li>More resistance to mortality than aspen under heavy grazing.</li> </ul>
<b>POISONOUS SPECIES</b>			
Baneberry	<i>Actaea rubra</i>	Unknown	<ul style="list-style-type: none"> <li>All plant parts are highly poisonous.</li> </ul>
Bog-laurel	<i>Kalmia occidentalis</i>	Unknown	<ul style="list-style-type: none"> <li>Grows together with and is somewhat similar in appearance to Labrador tea.</li> <li>Found in bogs, muskeg, wet mountain meadows and on peaty soils.</li> </ul>
Choke cherry	<i>Prunus virginiana</i>	Unknown	<ul style="list-style-type: none"> <li>Unpalatable leaves.</li> <li>Excess toxins are produced in leaves and new shoots during stress (frost, drought).</li> </ul>
Common horsetail	<i>Equisetum arvense</i>	Unknown	<ul style="list-style-type: none"> <li>No recorded ill effects to sheep. Has been reported as a problem in horses and cattle.</li> </ul>

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*Poisonous species continued on page 4.*

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<b>POISONOUS SPECIES (CONTINUED)</b>			
Douglas water-hemlock	<i>Cicuta douglasii</i>	Unknown	<ul style="list-style-type: none"> <li>• Most of the poisonous oils are concentrated in tuberous roots.</li> <li>• Starts growth before grass in the spring and stays green well into fall.</li> <li>• Avoid early turnout without sufficient spring forage, fall grazing and overgrazing.</li> </ul>
False azalea	<i>Menziesia ferruginea</i>	Nil	<ul style="list-style-type: none"> <li>• Mildly poisonous. Not consumed during the graze.</li> </ul>
Indian hellebore	<i>Veratium viride</i>	3rd–nil	<ul style="list-style-type: none"> <li>• Sheep can ingest toxic concentrations. Move the flock when palatable species have been grazed to prevent consumption. Poisons are concentrated in young shoots and roots.</li> </ul>
Labrador tea	<i>Ledum groenlandicum</i>	3rd–nil	<ul style="list-style-type: none"> <li>• Suspected as mildly toxic. Ledum is extremely unpalatable, which discourages consumption.</li> </ul>
Lupine	<i>Lupinus</i> spp.	1st	<ul style="list-style-type: none"> <li>• Seeds and pods were once reported to cause sheep poisoning. No recurrence in 50 years.</li> <li>• High crude protein changing to medium as seeds mature.</li> </ul>
Mountain death-camas	<i>Zygadenus elegans</i>	Unknown	<ul style="list-style-type: none"> <li>• Bulb and leaves are poisonous to humans and sheep.</li> </ul>
Mountain monkshood	<i>Aconitum delphinifolium</i>	Unknown	<ul style="list-style-type: none"> <li>• All plant parts are highly poisonous (contains aconitin).</li> </ul>
Rhododendron	<i>Rhododendron</i> spp.	3rd–nil	<ul style="list-style-type: none"> <li>• Suspected of being mildly poisonous.</li> <li>• Sheep might graze leaves when no other forage is present. Loss of muscular control results.</li> </ul>
Seaside arrow-grass	<i>Triglochin maritimum</i>	Unknown	<ul style="list-style-type: none"> <li>• Young shoots and re-growth are the most toxic.</li> <li>• Starts growth earlier and is green later than other species.</li> </ul>
Snowberry	<i>Symphoricarpos albus</i>	1st	<ul style="list-style-type: none"> <li>• Readily grazed by sheep.</li> <li>• The berries of this plant are considered toxic.</li> </ul>
Tall larkspur	<i>Delphinium glaucum</i>	1st	<ul style="list-style-type: none"> <li>• Apparently not toxic to sheep but poisonous to cattle (contains delphinine).</li> </ul>
Trapper's tea	<i>Ledum glandulosum</i>	3rd–nil	<ul style="list-style-type: none"> <li>• Toxic to livestock, especially sheep (contains a poisonous alkaloid).</li> </ul>

### PRECAUTIONS

- Experienced sheep tend to avoid some poisonous plants. Areas with some poisonous plants may be grazed with proper herding.
- Map and report poisonous species so that herders can take the necessary precautions.

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