



WASHINGTON STATE DEPARTMENT OF
Natural Resources

Washington State Department of Natural Resources
Forest Stewardship Program
Wildlife Fact Sheets

Wildlife Fact Sheets

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WADNR Wildlife Fact Sheet #1

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Wildlife Habitat Assessment

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There are many scientific ways to evaluate habitat. Most yield a quantifiable assessment of habitat conditions. However, all are time consuming and (usually) quite technical, with most requiring the services of a professional biologist if they are to be done properly and with an acceptable level of scientific credibility. Nonetheless, a woodland owner with an average understanding of timber stand features, plant identification, and basic wildlife habitat components can assess habitat conditions of their ownership. The following list of habitat structural components may be considered for a rough assessment of habitat conditions on your forestland. These habitat features on your land help determine what wildlife species or species groups might be expected and what wildlife habitat features you may want to protect or enhance. Many of the components on the list have been or can be determined from inventory plots or surveys conducted to evaluate timber resources as well as from aerial photos. Therefore, little additional work may be needed to assess basic wildlife habitat features. Actual quantification of these features gathered from plots or a straight-line transect approach (walk in a line through the timber stand) does give some solid quantifiable data. Even without inventory plots or transect data, habitat conditions can still be inventoried by a more subjective (but inaccurate) approach just by spending time in all portions of the stand and visually noting and evaluating the listed components. It is not absolutely necessary to measure each component on the list. However, the more features you can identify and quantify, the better idea you will have concerning wildlife species presence or habitat suitability and what features you may need or desire to manage for.

Keep in mind that some species are generalists in that they can and will use a variety of habitat types to fulfill their life requisites whereas others may require a very specific habitat component or a few components for all or a certain life requisite necessary for their survival.

Several good references exist that match habitat conditions with expected species presence.

HABITAT STRUCTURAL COMPONENTS

STAND SIZE- acreage of each stand and total for ownership.

AGE CLASS(ES) OF STAND(S)- If uneven-age management, list the basic age classes and relative ratio of each within each stand. If even-age management, list the age class of each stand.

SPECIES MIX- List the dominant and secondary species by both conifer and hardwoods (if present) in each stand.

SIZE CLASSES- include acreage or each or ratio, but generalize. Lump sizes by d.b.h. classes (such as <5", 6-10", etc.) or by verbal classification (shrub, sapling/pole, small saw timber, large saw timber).

CANOPY- depth (is it layered and deep or very thin and uniform?) and closure. These can be subjectively evaluated or measured.

SHRUB LAYER- what species are generally present and are they rare, occasional, or uniformly distributed throughout the stand.

GROUND COVER- list a few of the dominant species groups if known and estimate percent of cover (i.e. <10%, 11-25%, 26-50%, >50%)

SNAGS- number/acre, hard vs. soft, basic size class.

DEFECT- are there broken top trees, double leaders, substantial amounts of mistletoe, dead branches, root rot, noticeable heart rot, deformities, etc. If plots have been established, then count and classify the types of defect on each plot.

COARSE WOODY DEBRIS- logs per acre, size class (small vs. large: <15" d.b.h. and <10' long = small sizes, and hard vs. soft).

STREAM AND WETLAND SIZE AND CLASSES- also include width of riparian zone if one is evident.

WILDLIFE INDICATIONS- nest cavities, dens, tracks, scat, individuals or species observed, etc. This category is not as valuable as listing habitat components. Species presence is easily missed- even with well-designed surveys. However, habitat is either present or absent.

LANDSCAPE PERSPECTIVE- what habitat type (forestland, urban, etc.) is on the adjacent properties.

OTHER- There may be a group of snags or single outstanding wildlife trees on small acreages not counted in plots. Describe unique habitat or wildlife relationships (such as the presence of major wetlands on or adjacent to the stand, large seeps or springs, cliffs or talus slopes, known deer or elk winter range, calving areas, nesting or brood rearing areas, sensitive species presence, etc.), as well as the past history of wildlife or wildlife habitat on the site not described above.

WADNR Wildlife Fact Sheet #2

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The 10 Best Things You Can Do To Help Wildlife On Your Commercial Forestland

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Every forestland owner has different views of wildlife and different forest management objectives that may impact wildlife. Wildlife, of course, have various levels of impacts- real or perceived- on the health of the forest, on the landowners economic bottom line, and on the overall satisfaction or lack of the landowner derives from their forestland. Regardless of your overall objectives and the place wildlife may fit in, there are numerous things each forestland owner can do for wildlife on any stage of forestland development. The following 10 items are some of the most common and important planning and management measures that you can implement to address the widest array of wildlife species on almost any forested parcel- especially those managed for timber.

1. **MAKE WILDLIFE PART OF YOUR OVERALL FOREST MANAGEMENT OBJECTIVES.** Although this may seem obvious to many- it is not practiced by most. This is no different than making site preparation, plantation management, thinning or harvest layout as objectives. Considering wildlife habitat development and needs, and wildlife populations in your long-range management schemes is just good business. This includes both desirable wildlife species as well as those that do or may damage forest resources. (See Dale Nolte article in Winter edition)
2. **FAMILIARIZE YOURSELF WITH WILDLIFE SPECIES AND HABITAT EXPECTED IN YOUR AREA.** This is just as important as getting familiar with tree species and growth rates, site conditions, and other timber management parameters. In fact it is done the same way: read, take classes, ask questions, join organizations (such as the state farm forestry chapters), and the old time-tested method that successful tree farmers do so well- observe and record.
3. **INVENTORY HABITAT TYPES.** Just as you get familiar with your different timber stands and site characteristics and catalog these, the same can and should be done for wildlife habitat. More than 400 species of forest-dependent wildlife occur in the Pacific Northwest and they partition their basic habitat requirements among different stand sizes, age-classes, tree species and density, among other attributes. You can't do much about stand age and size but some key habitat components (described below) may be common to all stands. There are many ways to quantify habitat including listing several habitat variables on inventory cards in addition to the usual items when cruising forestland. A more subjective way is to

just list the habitat components you observe on your forestland but it is difficult to record quantifiable changes over time. What species you can expect is related to the different forest stand characteristics and the individual species' habitat requirements.

4. **MEASURE DECADENCE.** This refers to dead and dying trees – defined as snags and wildlife trees - those with a lot of defect such as broken or multiple tops, heart rot, or other forms of damage in addition to coarse woody debris - fallen trees, logs, large pieces of logging debris, and large fallen branches. The old adage that 'there's a lot of life left in that dead tree (or log)' is so true. In fact, better than a third of the forest dependent wildlife species find their food, shelter, or cover requirements in decadent trees and logs. Snags come in all sizes so don't overlook high stumps and small diameter suppressed trees as well when assessing this habitat component.
5. **ASSESS UNDERSTORY AND GROUND COVER.** This "brush" layer is food, shelter, and cover to well over 100 species of wildlife. Most of these understory trees, shrubs, and groundcover plants are partially shade tolerant. Pay particular attention to those that produce "mast"- berries, fruits, and nuts as these are particularly important. Consider how you can protect or even enhance some understory plant species within the confines of your timber management.
6. **LAYOUT ROADS AND SALE AREAS AND HARVEST TIMING TO MINIMIZE IMPACT TO WILDLIFE.** As example this may include no harvest during the spring or early summer nesting season if that is of concern or possibly no late winter harvest on wet unstable soils or in key winter range for some wildlife species. If you have choices you can decide where the best road locations are and how to lay out the unit to minimize habitat loss.

Well, the background education and planning is done. At harvest time you can put the planning steps into action.

7. **LEAVE A LEGACY WHEN CLEARCUTTING.** Of particular concern are snags, wildlife, trees, and coarse woody debris. These wildlife resources can be marked for retention at time of harvest. Where safety is an issue, consider clumping trees around the hazard tree so safety is not compromised. Even leaving high stumps standing or long-butts on the ground are excellent ways to retain some wildlife habitat structure. Questions always arise whether to clump or leave single trees. Why not use a combination of retention patterns so more diversity is added and you have more choices to minimize harvest and management problems?
8. **RETAIN EXISTING AND FUTURE HABITAT WHEN THINNING.** Poor quality trees or those with obvious signs of defect can be marked and retained for future wildlife use in stands slated for thinning. Consider a variable density thinning approach in order to open up some areas for more ground cover and shrub development and to retain some denser patches for hiding and shelter. Small diameter snags and smaller pieces of coarse woody debris can also be created and retained when thinning.

9. **PROTECT SPRINGS AND SEEPS.** These often get overlooked even where forest practice rules require their protection. Even the smallest of these contribute a great deal towards wildlife habitat. They serve as amphibian breeding pools, drinking water, and a source of forage and hiding cover around the wetted perimeter. Keep equipment and noxious weeds out of these and maintain a vegetated border when harvesting timber. With appropriate planning you can even develop some of these into a pool or series of small pools.

10. **SITE PREP AND SOW.** If you have done some harvest and subsequent site preparation you probably are going to get an invasion of some noxious weeds. Unfortunately, most of these have little wildlife value. Consider sowing one of the commercially available (or have one mixed) wildlife forage seed mixes along logging roads, skid roads, landings, on slash burns, steep hillsides, or other locations that need to be protected from erosion and weeds. Most mixes are not sown so heavily as to harm tree seedling growth nor do they include invasive species. You can even add some shrub seeds such as blue elderberry, cascara, serviceberry, or others in the mix to further enhance habitat in locations where they will not interfere with commercial tree growth.

WADNR Wildlife Fact Sheet #3

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Snags, Coarse Woody Debris, and Wildlife

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As any tree farmer or forestland owner knows, keeping trees alive and growing can require a tremendous effort. In fact, a large amount of the research, education, and management effort expended by forestry agencies and organizations is devoted to protecting forests from disease, fires, severe storms, competing vegetation, predation, insects, and anything else that kills or damages trees. Furthermore, some of these dead and dying trees can be hazardous to human life and buildings. Why all the fuss over protecting standing and fallen dead trees? Worse yet, why do some of us persist in suggesting you create these conditions? The short answer is when a tree dies; life begins for a lot of our native wildlife. In fact, more than a third of our wildlife species (including some fish and aquatic vertebrates) are dependent on dead and dying wood for their survival and well-being. First, let's define what it is that is so important then consider some management options to protect this resource while eliminating or minimizing the economic cost to the landowner.

VALUE TO WILDLIFE

SNAGS: Snags are standing dead trees. They are important as nesting habitat to more than 60 cavity nesting birds and mammals; species (woodpeckers and flickers) that either excavate holes in dead wood for nest and den sites, and those called secondary cavity nesters such as: bluebirds, flying squirrels, and wood ducks that use holes for nests and dens that were created by the cavity excavators. Some additional cavity work may be performed by some of the secondary cavity nesters. Several species of birds and mammals such as brown creepers and several species of bats nest or roost behind loose bark on those snags that have not yet decayed to the point the bark is gone. Some birds such as Vaux's swifts, and small and large mammals alike, from flying squirrels and pine martens, to black bears; use large hollow snags for nesting, roosting, and denning. Some species such as eagles, ospreys, and some hawks and owls build nests in the broken top snags or uppermost large branches. Snags are important as perch sites and even launch sites for foraging forays by some raptors (hawks, owls, eagles) and flying squirrels. Some raptor species use the tops of large snags as a sentry post within their territory or for plucking posts for eating their captured prey. Some woodpeckers hammer or drum on hard snags as a form of territorial and/or mating communication. Another extremely important function of snags is a large number of bird species use them as a food source. They glean insects and other invertebrates from dead wood, bark, fissures, and cracks in dead and dying wood. A few species even use cavities and crevices in snags to cache their food for later use. In total, more than 100 species of wildlife need snags for nesting, roosting, shelter, and feeding. The majority of these species consume vast quantities of insects, many of which are injurious not only to trees, but to crops and humans as well.

Many live trees may also be classed as snags or “wildlife trees”. These include trees with large broken tops and ensuing decay and rot/or a significant number of large dead branches, hollow trees created by advanced heart rot fungal growth, as well as those severely infected with mistletoe and covered with brooms. Some may live for long periods with the defect created by storms, disease, fire, and insects; yet they are functioning as snags for wildlife.

COARSE WOODY DEBRIS: Coarse woody debris includes fallen trees and large branches as well as logs and large pieces of wood left from logging operations. This habitat component serves many of the same purposes as snags: nesting, denning, roosting, foraging, and hiding cover and shelter from inclement weather. At least as many vertebrate species use coarse woody debris as they use snags. Some are the same species such as black bears using large hollow logs and woodpeckers foraging for insects. Some are seen on the exterior such as ruffed grouse using logs for drumming sites as part of their mating ritual. A lot of small mammals use this habitat type for hiding and food caches. Probably the most unique life form using coarse woody debris is several salamander species. Some may spend just their adult life phase in a rotting log foraging for invertebrates and hiding, whereas a few species may spend their entire life in a single log from egg phase through adulthood. Coarse woody debris is host to a huge number (about 400 known) of insects and an unknown but large number of non-insect invertebrates. These are used as food sources by many of the vertebrate species found on and in coarse woody debris. The ultimate fate of all these species, in conjunction with the decomposing forces of fungi is to break down the woody fiber into organic matter that is utilized by the surrounding growing forest.

SNAG AND COARSE WOODY DEBRIS CHARACTERISTICS

From a wildlife perspective, not all snags and downed logs are equal. Factors influencing their value to wildlife include: stage and type of decay, size, and species. Furthermore, the total number and distribution throughout the forested landscape are important.

DECAY AND DECOMPOSITION: Snags and coarse woody debris go through an entire decomposition cycle, from the hardest and greenest fresh stage through the final stages where they are almost completely decomposed. The various species of wildlife that use these habitat features are selective in that not all stages of decomposition are used by the same wildlife. Furthermore, not all snags decay at the same rate or in the same way; it depends on the size of the tree or log, the species, the agent that killed the tree, and of course, the environment and location. As a rule of thumb, more wildlife species use the harder snags and downed logs than those of the more advanced stages of decay. Forest stands with only highly decayed snags and coarse woody debris, even if in large quantities and well distributed, can be expected to have low populations of wildlife dependent on this habitat type. Nesting and denning habitat is best prepared in not only firm snags and logs but in those that are hollow, as a result of heart-rot causing fungi, or have large internal cavities or crevices in them. While the several root rots readily kill many conifers, the decay usually starts in the cambium layer causing rot from the outside working towards the tree’s center. While this allows foraging habitat as insects attack the cambium, few nesting or denning opportunities are created. Furthermore, many trees killed by some roots, rot and do not last long either as a standing snag or as a piece of coarse woody debris.

SIZE: The height and diameter of snags and coarse woody debris is important. As a general rule, as diameter and height or length increases, more species of wildlife can be supported. Furthermore, the largest snags and coarse woody debris usually last longer in the environment and are useful to wildlife for a longer period than the smaller diameter and shorter snags and logs. While snags as small as six inches in diameter and about six feet in height are used for nesting, denning, and foraging by a few species of wildlife; snags greater than 20 inches in diameter and 60 feet tall can accommodate all snag dependent species. Occasionally, large diameter stumps at least three feet tall can be used for some denning, roosting, and even nesting by some species of the smaller cavity nesting birds as well as some forest bats and flying squirrels. A special concern, however, is for species such as black bears. Use of winter dens and summer shelter often occurs in large hollow trees. These need to be upwards of three feet in diameter to be accessible by bears.

Foraging occurs on all sizes of snags and dead wood. But like cavity nesting, the larger pieces can support more invertebrates and thus, more foraging. However, a large number of even the smallest snags and downed logs, including those killed by suppression mortality, as well as high stumps can and do supply a great deal of foraging habitat.

Like snags, the larger pieces of coarse woody debris are necessary to support a full compliment of wildlife dependent on this habitat feature. To really begin to be useful, this component should be at least 10 inches in diameter and 12 feet long. However, the greatest use for the longest period is in those pieces at least 30 feet long and at least 20 inches in diameter. Again, black bears need even larger diameter hollow logs for denning. Stumps and large diameter butt ends of logs left over from logging operations will be used by some species of wildlife needing large coarse woody debris.

TREE SPECIES DIFFERENCES: Not all species of snags and coarse woody debris have the same value. While all species of conifers and hardwoods are used, some marked differences in the level and intensity of use by some wildlife species on certain tree species have been documented. East of the Cascade Mountains ponderosa pine, western larch, quaking aspen, and paper birch are some of the most favored conifers and hardwoods. West of the mountain crest, Douglas fir and western red cedar replace pine and larch for favored status. Hardwoods also get utilized and where available, big-leaf maple and cottonwood are readily used. As a matter of fact, the larger cottonwood trees get heavy use on both sides of the mountains. Their distribution on the east side is relegated more to the riparian and wetland zones. While red alders are well distributed and do see good use for cavity nesting and foraging, they only last a few years at best after death, either standing or down. Another important tree for cavity nesters on both sides is grand fir. This species is very susceptible to some heart-rot causing fungi (as many tree farmers are aware). This feature makes the larger grand firs very valuable to all cavity nesters and denners including black bears.

NUMBER AND DISTRIBUTION: This feature, along with size requirements, probably causes the most controversy and problems for forestland owners as well as the wildlife that use snags and coarse woody debris. A great deal of research has been conducted and results interpreted and applied, including as regulation, across the northwestern states. In determining the necessary number and distribution of snags, a lot depends on the requirements of existing wildlife, location, forest type, past management, and the condition of surrounding lands. Obviously,

identifying these conditions is not always possible when managing a given piece of forestland. Therefore, some generalities can be applied. The existing forest practice requirements and recommendations in Oregon and Washington will accommodate a minimum number of dependent wildlife species when properly applied. However, they do not equal conditions found in older unmanaged forests that contain healthy and viable populations of snag and coarse woody debris dependent wildlife. East of the Cascade Mountains, the most recent studies revealed that to retain viable populations of cavity nesters, about four snags greater than 10 inches in diameter were needed on a per acre basis with about two of these greater than 20 inches in diameter. Numbers were similar but slightly higher on the Westside. Variation in height, diameter, and numbers has been recorded in individual studies, but all showed that more snags and the larger class sizes are needed than what present forest practices calls for. These studies were most concerned with nesting, denning and maintaining viable populations of cavity nesters. They did not take into consideration the need and impact of all foraging habitat components such as the very small diameter snags and large diameter stumps. In one earlier study on the Westside, it was shown that an average of 16 snags per acre of all sizes, decay classes, and species were present in unmanaged stands containing healthy populations of all snag-dependent wildlife expected in that area.

The requirements for coarse woody debris are not as well defined as for snags. However, every study shows that more and of larger sizes than are presently required in managed forests is needed to maintain healthy populations of wildlife dependent on this feature. Eastside forests with healthy populations of coarse woody debris dependent wildlife contained about 90 logs per acre, averaging 34 feet in length and at least 15 inches in diameter. Studies in Westside forests have shown similar trends and a need to upgrade the number and size behind in logging operations.

In unmanaged forest landscapes, distribution of both snags and coarse woody debris shows trends of both clumping and individually scattered snags and pieces. This is to be expected as these habitat features are formed from fires, storms, insects attacks, and disease; events that kill trees both in patches or clumps as well as scattered randomly across the landscape. While present harvest management trends are to clump these components near streams or wetlands, the presence and need for these habitat components exists on the forested uplands, side slopes, and ridge tops as well.

SNAG AND COARSE WOODY DEBRIS MANAGEMENT

The cheapest and best method for managing these resources is to retain them where they exist, and allow natural processes to continue recruiting new material into each forested stand. Where forestland is being managed or has experienced intensive management in the recent past, this practice often conflicts with management objectives or does little for wildlife species needing these forest components. For example, thinning programs often remove not only existing snags and coarse woody debris, but also those poorer quality and defective trees that would be recruited into these components in the future. Additional management may then be necessary to speed the development of these habitat resources, to reduce overall costs of lost harvest opportunities to the landowner, and to reduce hazardous situations. Numerous management techniques have been developed and are too lengthy to include here for each situation. Nonetheless, several approaches that have worked are listed briefly below. Just keep in mind what snag and coarse woody debris dependent wildlife need and what and where

these features are (or are absent) in your stands. Incorporate some of these measures and any others that may be useful wherever possible during harvest planning or other stand management activities. Most of the implementation costs can often be cost-shared through several federal and state programs.

- Retain snags and coarse woody debris wherever possible.
- Select poorly formed or low quality trees for retention as future snags (and eventually coarse woody debris). Trees with obvious defect including fire scars, broken tops, dead branches, signs of heartwood decay, etc., are excellent ones to leave for future wildlife use.
- Leave cull logs and butt ends and tree tops scattered throughout the logging unit instead of piling and burning on landings.
- Clump green trees and retention trees around existing dangerous snags so they may be left.
- Reduce broadcast burning in areas with good or large pieces of coarse woody debris and snags; spot burn around those areas.
- Create snags by cutting, blasting, or girdling at the point of desired breakage. While the larger ones are most desirable, all sizes may be created. Select the poorest quality trees if necessary for creating snags. By killing poorer quality trees, no poor genetic material will be broadcast in their seed nor will they compete for light and nutrients with crop trees. Where creating living snags is possible, top or girdle above the fourth or fifth whorl of branches.
- Consider leaving high stumps wherever possible in harvest units. These may be those with obvious butt swell and/or defect that would have little or no merchantable value.
- While thinning may reduce future snag recruitment, it also offers an excellent opportunity for creation of low cost (or no cost) snags during harvest activities. Chainsaw fallers and especially mechanical harvesters can be used to create snags of all heights and diameters while on the unit. A variable density-thinning regime can be employed to protect and create snags, as well as other wildlife habitat components such as understory shrubs and forbs. Very light or no thinning can be included around existing potentially dangerous snags. New snags can be created out of low quality trees within areas being thinned. This may require thinning those areas more heavily to allow equipment in and to reduce hazard situations. These more heavily thinned patches, promote the development of understory vegetation to the benefit of other classes of wildlife.

Many landowners put up bird nesting boxes. While many of these do enhance nesting opportunities for the short term, they do not replace snags and their entire associated wildlife habitat uses for the long term, nor do they supply foraging substrate or coarse woody debris.

WADNR Wildlife Fact Sheet #4

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Native Trees and Shrubs with High Wildlife Value

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The following is a partial list of native hardwood (deciduous) trees and shrubs that can be maintained where found or planted (some may be transplanted) on western Washington forestland where creating and maintaining wildlife habitats are ownership objectives. Some such as Pacific madrone and blue elderberry have very poor survivorship when planted from bare rootstock. These species do best when they are potted (balled root) or started from seed. Most of these species produce fruits (soft mast) or hard seed or nuts (hard mast) that is relished by many bird and mammal species.

- **Cascara** (*Rhamnus purshiana*) an excellent and easily planted (or transplanted) small tree that is quick growing and somewhat shade tolerant.
- **Hawthorn** (*Craetagus spp*) goes by numerous names with many varieties (some containing thorns Very hardy and fast growing producing fruits at an early age.
- **Serviceberry** (*Amelancher spp*) A shrub with edible fruits relished by many bird and small mammal species. Prolific bearer on moist and sunny sites. Flowers are an excellent source of nectar. Twigs and leaves heavily browsed by deer and elk. Good nesting and hiding habitat for many bird species.
- **Bitter cherry** (*Prunus emarginata*) On good sites develops into a tree. Good cavity tree.
- **Blue elderberry** (*Sambucus glauca*) Excellent berry producer (edible). Somewhat shade tolerant. A long-lived shrub relished by many species of wildlife, but hard to establish in Western Washington.
- **Red elderberry** (*Sambucus racemosa*) Very prolific and easily established. Not as long-lived as blue elder.
- **Red-osier dogwood** (*Cornus stolonifera*) An excellent mesic (moist) site and riparian species that is easily established from cuttings and very prolific. Somewhat shade tolerant.

- **Pacific dogwood** (*Cornus nuttali*) Small tree that is shade tolerant. Susceptible to introduced disease.
- **Pacific crab apple** (*Malus fusca*) Grows to small tree height. Excellent wildlife fruits. Grows very well on wet soils in full or partial sun.
- **Pacific madrone** (*Arbutus menziessii*) A broad-leafed evergreen tree growing on gravelly well-drained soils. Very hard to establish. Excellent mast producer and cavity tree.
- **Mountain Ash** (*Sorbus sitchensis*) Grows to small tree height with very persistent (lasts into winter) hard red berries used by many bird species during the long winters.
- **Beaked hazel** (*Corylus cornuta*) Dense growing shrub with small nut on female tree consumed by a large number of birds and mammals. Good nesting and escape cover for a variety of bird species
- **Vine maple** (*Acer circinatum*) Grows individually or in small clumps. Attractive shrub (can get quite large) with a small seed. Excellent food, shelter and cover.
- **Bigleaf maple** (*Acer macrophyllum*) A shade tolerant large tree that produces not only food in the form of seeds and leaves primarily, but develops excellent shelter and cover including hollow stem and branches that are used by a variety of forest wildlife species.
- **Oregon white (Garry) oak** (*Quercus garryana*) A large tree with excellent hard mast (acorn) production in good years. Forms excellent shelter and cover structure. However, this species is very slow growing and very shade intolerant. Very long-lived .
- **Red flowering currant** (*Ribes sanguineum*) A small early blooming shrub. Flowers favored by hummingbirds in early spring and fruits by a variety of species. Do not plant adjacent to western white pine.
- **Willow** (*Salix spp*) Several species that grow in a variety of habitats. The leaves and soft branches are consumed by many species. Black-tailed deer often select willows as ‘rub’ trees.

There are many more shrubs and small trees native to the area that can be planted. These include (among others) the huckleberry group (especially red and evergreen huckleberry), native roses and ground covers such as Oregon grape and salal that can be planted or at least maintained where found. Other large deciduous trees such as cottonwood planted or maintained on damp sites may develop wonderful wildlife habitat characteristics. These species are usually very quick to establish on disturbed sites so may already be present on your land. A quick inventory will determine what species are already present.

WADNR Wildlife Fact Sheet #5

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Variable Density Thinning For Wildlife and Wood Production

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Variable density thinning has been around awhile, but only recently is it being tested and more commonly considered. It is usually considered in a landscape context, but has application to small woodlands to develop more microsites for many species of forest dwelling birds and mammals. Applied appropriately, it will protect and accelerate the development of a much greater habitat benefit by increasing diversity both horizontally and vertically. It can promote the development of more ground cover, hardwood trees and shrubs, more edge (which has a downside due to potentially increased predation-but that does benefit the predators!), more escape and thermal cover, and definitely more foraging habitat spread over small woodlands. Variable density thinning also applies to pruning regimes.

This approach retains clumps and patches of both more heavily thinned and lightly (or not at all) thinned trees. Again, this retains the food, shelter, and cover requirements of those species needing very dense vertical cover in the un-thinned or lightly thinned patches, as well as small sites that warm up quicker in spring and summer and that develop and maintain good ground cover in the heavily thinned portions of the stand. There is no well-established standard for this approach. Anecdotal information paired with diversity studies has shown that, on average, at least two patches each of both heavier and lighter thinned (with each patch about 50 feet in diameter) on a per acre basis, will supply a more diverse wildlife habitat in stands to be pre-commercially or commercially thinned. Heavily thinned means taking it down to no more than a 40% canopy closure (it can be less than 40% or even clearcut in small patches). This approach means that about one-eighth acre will be heavily thinned and one-eighth acre lightly or not thinned at all for each acre in the unit. Light or no thinning should supply hiding and some thermal cover to birds and mammals from the forest floor up to the mixed canopy layer. This prescription does not need to be applied uniformly on each acre in the entire thinning unit, but can be somewhat dispersed and random. However, the more it is applied to a forest stand slated for thinning and/or pruning, the greater the benefits to wildlife. Furthermore, snags may be created in the more heavily thinned portions and those large and dangerous snags presently existing, or to be created, may be identified and centered in the lightly or non-thinned portions. This is an important consideration as many trees that are or would become snags (or "wildlife trees") without management are usually removed during thinning regimes-thus a net decline in snags and associated wildlife species occurs. Snag protection and creation is an integral part of this approach. Even in the more heavily thinned portions, high stumps and small diameter

snags can be created. An opportunity exists to create coarse woody debris in both the more heavily thinned and lightly thinned portions. In the openings, grasses, forbs, and/or hardwood shrubs and trees may be planted if desired to accelerate development. Patches may overlap from one acre to the next-combination approaches can be applied. The final prescription for the stand will need to reflect stand characteristics, wildlife habitat needs on the ownership and landscape, and the long-range financial goals for the forest.

Wildlife Forage Seed Mixes

Several mixes of legumes and grasses are available that will increase wildlife forage on disturbed sites such as logging roads, landings, and slash-burn sites. They supply forage to big and small game species while reducing erosion on road cuts. Many variations of these mixes can be used depending on the site, soil, moisture conditions, seed availability and cost. On the east side, a mix of about 60-70% grass to 30-40% legume is commonly used although these can be varied depending on the site and seed availability. Many of the legumes are used first by wildlife, but may die out leaving the grasses. Fall and spring sowings may be the best on the west side with fall, winter and spring good on the east side. The key is to sow the site as soon as possible after site disturbance to assure good seed set and to beat out the competition by noxious weeds that will rapidly fill in most disturbed sites. Noxious weeds must be controlled if they are already established on the site prior to planting.

WEST SIDE

Shade Mix

<u>Species</u>	<u>Pounds/acre</u>
Fine Fescue	17
Big Trefoil	2
Annual Rye Grass	1
White Dutch or Subterranean clover	<u>2</u>
TOTAL	22 POUNDS/ACRE

Clear-Cut Areas

Perennial Rye Grass	2
Annual Rye Grass	2
Orchard Grass (dwarf is available)	4
Fescue	1
Yellow Sweet Clover	4
White Dutch or Subterranean Clover	2
Birdsfoot Trefoil	<u>5</u>
TOTAL	20 POUNDS/ACRE

EAST SIDE

Mixes vary on the east side of the Cascades therefore they are given here in percentages of the total. These can be adjusted according to the site conditions and seed availability. Normal sowing rate is from 10-16 pounds per acre. The purer the seed mix, the lighter the sowing can be. White Dutch clover is excellent, but usually much more expensive than Alsike clover. One mix that can be varied is as follows:

<u>Species</u>	<u>Percent of total</u>
Sherman Big Blue Grass	4
Regar meadow Brome Grass	20
Paiute Orchard Grass	18
Festorina Tall Fescue	10
Timothy Grass	11
New Zealand White Dutch Clover	10
Small Burnett	5
Ladino Clover	10
Medium Red Clover	9
Ladak Alfalfa	<u>3</u>

100% seed mix of:
63% grass seed
37% legume seed