

There are a few scattered poor to fair quality stump sprouted maple that have 40 year old shoots with a DBH of 6-12 inches. Approximately 25% of the stand is older trees. There are a few scattered poor quality 60-90 year old red alder that have excessive branching and some breakage, with a DBH of 10-20 inches. There are also a few poor quality 60-90 year old big leaf maple and western hemlock that have a DBH of 14-24 inches and 12-24 inches, respectively. There are a few 90-120 year old, limby western red cedar that have a DBH of 36-40 inches. There is one notable, large Pacific madrone to the north of the trail that is 90-120 years old with a DBH of 20 inches. These older trees were left during the preceding logging due to poor quality for saw logs. They do have considerable value for wildlife.

There are also a few widely scattered 10-20 year old limby, but otherwise good quality, western red cedar of natural reproduction that have a DBH of 4-6 inches. Within the conifer component are pockets of trees infected with root rot as evidenced by snags and blow-down. Understory is mostly salmonberry, elderberry, stinging nettle, and foam flower. Within the numerous small openings in the forest canopy there is especially dense elderberry and salmonberry. There are scattered holly trees. There are scattered relict old-growth stumps, many serving as a nursery beds for red huckleberry. Along Hansville Road there are many openings which are dominated by salmonberry, thimbleberry and Himalayan blackberry.



Trail Segment 3 – Clump of 40 year old western red cedar with red alder in background

Trail Segment 3 – This segment goes through a stand that is mostly 40 years old, indicative of a logging entry that took place around 1970. This resultant stand is fully stocked with mostly clumps and individual trees of western red cedar (60%) mixed with red alder (40%) that are mostly 40 years old, with scattered older trees. All trees are natural reproduction that

came in following a near clear-cut logging. The cedar trees are generally good quality with a DBH of 4-12 inches.

Within clumps trees are tightly spaced, being as close together as 6 feet. Dominants are at least 15 feet apart with a DBH of at least 6 inches; suppressed and co-dominant trees are generally less than 6 inches. Within clumps cedar generally have fewer lower live branches than when intermixed with alder, due to self-pruning resulting from shading. Within clumps along the trail, the bark of some of the cedar trees has been stripped by deer, and bear as well. Red alder is fair to good quality, with dominant trees generally being good quality and suppressed trees being lesser quality, having small tops and breakage.

The DBH of dominant alder is 8-12 inches and suppressed trees are less than 8 inches. Dominants are spaced approximately 15 feet apart. The diameter of dominant alder is generally less than would be expected at this age, presumably because there has been prolonged competition from closely spaced trees. There are scattered 60-100 year old limby but otherwise good quality western red cedar with DBH of 30-40 inches, and poor quality red alder and western hemlock with DBH of 12-16 inches. The older alder has considerable breakage and the western hemlock has poor form and defect. Overall average spacing of all trees in this stand is approximately 12 feet. Understory is mostly salmonberry, elderberry, stinging nettle, and foam flower. Within cedar clumps there is little understory vegetation due to shading. There are numerous snags and downed logs, mostly of small diameter suppressed trees. There are scattered relict old-growth stumps.



Trail Segment 4 – Fully stocked stand of fair quality 40 year old alder

Trail Segment 4 - This segment goes through a fully stocked stand of mostly fair quality 40 year old red alder, with a few scattered older trees. The previous stand was clear-cut logged around 1970, and the current alder stand came in closely spaced through natural reproduction. The DBH of dominant alder is 8-12 inches and suppressed trees are less than 8 inches. This diameter of dominants is generally less than would be expected at this age, presumably because there has been ongoing competition from closely spaced trees. Dominants are spaced approximately 15 feet apart. Tops of most alder are small due to shading and breakage of branches from rubbing against neighboring trees. There are a few scattered 10-40 year old relict, old-growth stumps.

Trail Segment 5 - This segment goes through a stand that starts at several stump sprouted maples at the west end of segment 4 and continues through the western half of this stewardship area. It generally proceeds through a fully stocked 25 year old Douglas fir plantation, with a few scattered individuals and small clumps of red alder that are natural reproduction of similar age. This area was clear-cut logged in 1985 and replanted to Douglas-fir on approximately a 12 foot spacing, with good survival. Natural thinning of this stand is occurring through competition between trees.

Dominant and co-dominant trees in this stand are good quality and have a DBH of 12-16 inches and 8-12 inches, respectively. Dominants have full crowns and are spaced approximately 15 feet apart. Intermediate and suppressed fir trees have a DBH of less than 8 inches, and are in the process of being shaded out of the stand. Most fir trees have many dead limbs on their lower trunks due to self-pruning as a result of shading. Eventually these branches will be shed. There was limited invasion of scattered red alder into this stand. These occur as individual trees and small clumps.

Dominant red alder have a DBH of 8-10 inches and suppressed have a DBH of less than 8 inches. Tops of most alder are small due to competition. There are also a few scattered, limby but otherwise good quality western red cedar in this stand that are 10-40 years old. Spacing of all trees in this stand averages approximately 12 feet.

Understory vegetation is predominantly sword fern and salal, with density depending on sunlight reaching the soil surface. In areas of densest shade, understory vegetation is nearly absent. There are three small stream crossings in this stand (only the westernmost has a walking bridge). Wetlands associated with these streams are dominated by moderately stocked stands of red alder. There is a fairly large false lily of the valley patch along the trail in the vicinity of one of the streams.

There are numerous snags and downed logs in this unit that are mostly small diameter fir and alder. There are also scattered relict old-growth logs and stumps. One relict old growth log is across the trail, with a notch cut at the trail location to allow access. The stand to the north of this trail segment, outside the greenway, is similar to the stand of trail segment 2.

## Wildlife

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The vegetative units within this stewardship area provide considerable diversity of habitat for upland wildlife. There is also limited but important habitat for wetland wildlife in small streams and wetlands. The fact there are different forest stand types in close proximity and small streams and associated wetlands intermingled in the western part of this area creates a synergism of wildlife habitat value. Human presence probably has a muting effect though,

most likely limiting use somewhat by larger mammals. Any disturbances outside the 100 foot wide easement could also have a negative effect.

The 25-40 year old and older red alder, while standing, provide roosting and perching habitat for numerous species of birds, and a limited food source mostly of seeds. These trees also provide cover for numerous species. Leaves provide a food source for aphids, caterpillar stage of insects, etc. Fallen leaves enrich the soil and provide food and habitat for decomposers like fungi, bacteria, earthworms, slugs and insects, and the numerous terrestrial species which feed on them. As the alder trees age, they will be breaking apart and dying for the next 30-40 years, and considerable downed wood, snags and holes in the canopy will be created. Openings will be extensive in stands that have a significant percentage of alder, like those along trail segments 2, 3, and 4.

The downed wood and snags of alder will provide habitat for up to 100 terrestrial species. Insects will thrive in the decaying wood, and woodpeckers and small mammals will seek them out for food. Primary and secondary cavity nesting birds will use the snags. Fungi will thrive as well, creating food for small rodents and other animals. These openings will be populated by early successional plant species. These species will increase in abundance with increasing light and will be used by wildlife species such as band tail pigeons, grouse, black bear, deer and song birds seeking berries and browse, and humming birds, butterflies and bees seeking nectar.

There is potential for invasion of Himalayan blackberry. If this occurs it should be controlled to prevent crowding out of native species. These openings will probably last a long time, because only shade tolerant trees like western hemlock, grand fir and western red cedar are apt to invade these dense brush patches. The establishment of trees will be slow and expected stocking will probably be poor, due to dense shading by the canopy of brush. Crown closure of the overstory won't be possible with trees being widely spaced, and the stand of brushy species should survive long term without human intervention. This scenario is especially true for the stands of trail segments 2 and 4.

The existing cedar will fill most holes created in the stand along trail segment 3, but some of the larger holes will remain long term. The individuals and clumps of existing cedar trees in all stands will provide long-term thermal and hiding cover for numerous species, perching and roosting for birds, including bald eagles when trees are older, and a food source for species such as squirrels. The scattered 60-100 year old Douglas-fir and western hemlock scattered in all stands will create sources for enduring snags and downed logs, and while standing will provide habitat similar to that described for cedar.

The 25 and 40 year old Douglas-fir plantations and the young red alder and western red cedar within these stands will provide hiding and thermal cover, and lots of sources for downed wood and snags as the progression of natural thinning occurs. The small diameter wood will rapidly decay and have limited use, but the source will be ongoing, and diameters will increase over time.

In alder areas, the dense understory dominated by brushy species will provide the wildlife benefits outlined above. The red alder will mature and die over time, and wildlife benefits will be similar to those described in the preceding paragraph for the mature red alder components of stands. Wooded wetlands and streams will be havens for amphibians. The

young conifer will provide habitat for small forest raptors such as sharp-shinned and Cooper's hawk, which feed on small birds that in turn are feeding on brush and nesting in small trees.

The Douglas-fir stands and clumps of mixed species of conifer or cedar should continually be closed canopy. Scattered conifer inter-mixed with alder will eventually become dominant, as the shorter lived alder dies off. Crowns of conifer trees will expand as adjacent trees die. Long term habitat will be that of a mature second growth forest, with upper crowns providing habitat for canopy dwellers like Douglas squirrels, owls and bald eagles. Bats will probably roost in the deeply grooved bark of old trees. Rodents and insects will live on the forest floor in the relict downed logs and stumps and the on-going supply of downed wood. Snags as they occur will be used by wood peckers and primary and secondary cavity nesting birds. Some trees will get heart rot, creating cavities for dens for bear and other mammals.

Generally the conifer stand will not provide significant food source for most species, but will be used mainly for thermal cover, a travel corridor and safe haven. There will be a long term shrub component due to openings created by dying alder, which will retain an important food source for song birds and other animals. The relict logs and stumps in all stands provide habitat for insects and small mammals. Black bear signs have been observed in this area in the past, and there is apparent bear damage to several cedar trees along trail segment 3.

Along trail segment 1 there are openings adjacent to Hansville road that are predominantly salmonberry, thimbleberry and Himalayan blackberry. These berry patches will probably remain long term, because the dense shade they cast tends to keep trees from establishing. These patches are probably used heavily at times by such wildlife as small mammals, songbirds, bees, hummingbirds, deer, bear, and raccoons.

Maintaining cover in this stewardship area will be increasingly important as housing developments are constructed in the area. The small streams and adjacent wetlands along trail segment 5 provide potential habitat for fish, amphibians, waterfowl, beaver and more. They are a source for drinking water for all wildlife. Refer to Appendix I in this report for a more complete listing of wildlife species present.

## Objectives/Alternatives

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- This stewardship area is functioning as a diverse wildlife habitat area. The vegetation provides breeding, foraging, refuge and nesting cover for numerous wildlife species.
- Minimize disturbance to streams and associated wetlands. Create formal elevated paths and small bridges over these areas.
- Allow natural succession to occur within forested areas, with the eventual resultant climax community of moderately stocked, western red cedar dominated forest intermixed with small openings of brush throughout trail segments 2,3 and 4. A fully stocked Douglas-fir forest will result along trail segments 1 and 5.
- With permission of the property owner, consider planting larger holes of alder mortality with shade tolerant tree species such as western red cedar, Sitka spruce, western hemlock, and yew. Plant these trees on twelve foot spacing in openings beyond the drip lines of existing trees. Competing vegetation will need to be controlled for at least a 4 foot radius at each planting site until trees have over-topped competition. This will ensure the maintenance of at least a moderately stocked forest stand in most areas presently dominated by red alder.

- With permission of the property owner, consider creating short snags of hazard trees in close proximity to the trail by cutting trees at a height of at least 6 feet.
- Control noxious weeds, Himalayan blackberry and holly as they occur. Control invasive vegetation along existing trails to keep them open.
- Minimize disturbance to relict old stumps and downed, decayed old growth logs.
- Avoid additional trail placement within stream buffers and adjacent wetlands to maintain a low level of human disturbance.

## Field Observation Notes

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1. Three small streams and associated wetlands are crossed by trail segment 5. These are headwaters for a larger stream that outlets into Puget Sound at Hansville.
2. Old railroad grade at west end of area
3. Relict old growth stumps with notches and fire scars and downed logs. Most are acting as nurseries for red huckleberry, western hemlock and ferns
4. Naturally seeded red alder and western red cedar stands along trail segments 2, 3 and 4
5. Fully stocked Douglas-fir plantations along trail segments 1 and 5
6. Bear damage to several cedar trees along trail segment 3
7. A “carpet” of false lily of the valley along part of trail segment 5 in vicinity of the streams
8. Abandoned sand pit southwest of trail head at Hansville Road
9. 100+ year old Pacific madrone with a DBH of 20 inches north of trail segment 2
10. Deep sandy soils that allow for deep rooting of trees – contrast this with shallow rooting of trees in parts of stewardship areas 13 and 14