

botanical surveys, wetlands consultation, rare species, ecological restorations

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The following are comments in response to the applicant's document, Exhibit 4, Natural Features Assessment, regarding rare plants and communities.

- Aster vialis and its habitat exists on the site in different areas than the applicant reports
- Cimicifuga elata exists over a larger continuous area than the applicant reports
- Mitigation and enhancement measures for Aster vialis are insufficient in scope and area
- Mitigation/ enhancement and avoidance measures for Cimicifuga lack scope and enough area
- Salvage transplantation is too risky to be a reliable mitigation strategy
- Salvage transplantation to small, shaded areas is likely to be unsuccessful
- Seed collection and grow out efforts are possible but lacking for Aster vialis
- Seed collection and grow out efforts are possible but lacking for Cimicifuga
- Avoidance of impacts to Aster vialis is not considered; a roadway impacts plants
- Avoidance of impacts to Cimicifuga elata is insufficient; home lots impact plants
- Forest thinning and understory enhancement areas are too small and isolated to be beneficial
- Protection areas proposed for Aster vialis are extremely small, isolated and unmanageable
- Protection areas are proposed for Cimicifuga elata are insufficient
- Larger areas for restoration of oak woodlands could and should be undertaken
- Restoration and enhancement of oak savanna is omitted from resource plans
- Restoration and enhancement of oak savanna would increase Aster vialis habitat on the parcel
- Assurances of protection, mitigation & enhancement performance are absent
- Enhancement, restoration, protection monitoring/ reporting is not described
- Mitigation/enhancement failure contingencies are not addressed, funded or insured

1) Both Aster vialis and Cimicifuga elata occur in larger and different areas and, therefore, in greater numbers on the Green Valley PUD parcel than are described or mapped in Exhibit 4, figures 1 and 3 and related text called "Natural Resources Assessment". For example, on 9-21-06 I confirmed a vegetative plant of Aster vialis about 290 feet south southeast of the center-line of Hunter's Glen Drive and 60-70 feet west south west of the center line of Dillard Road. A second qualified botanist, Dharmika Henshel, accompanied me to confirm that this locality is part of a larger local reproductive population occurring on both sides of Dillard Road. Likewise, a 260 by 290 (n-s by e-w) foot extension of Cimicifuga elata habitat further north and west from the described habitat (figure 1) is required to accommodate my previously submitted report of September 20, 2005, mapped by Dr. Jim Reed (attached). At least 2 plants were located in that area. Both of my site observations were cursory, not an extensive site survey. Thus I conclude that additional plants in other areas would likely be located. While I applaud the applicant's efforts to map and offer some scanty protection and salvage area opportunities for these rare plants, I assert that the needed areas for protecting or relocating salvaged plants from these areas require greater acreage than that indicated by the applicant's consultants. All additional plants that I have seen would appear to be impacted by the proposed development, Aster vialis by the northeastern angled access of the proposed Chiara Terrace, and Cimicifuga elata by housing lots 47-50. The applicant's consultant does not locate individual plants by map or overlay precise locations of rare plants onto the proposed development footprint. Thus it is impossible to determine how many plants or what portions of the reported occurrences would be impacted by development, and require transplantation.

CONCLUSIONS: Expanded protection areas for both Aster vialis (at least 2.35 acres) and Cimicifuga elata are needed. An analysis of the number and location of individual plants that would be impacted by the development footprint is lacking, despite the impressive thoroughness of Exhibit 4. The scanty, narrow area set aside for protection, and for salvage transplantation of Aster vialis is insufficient. Access to this area through home site lots appears unmanageable. Northeastern Chiara Terrace impacts a population of Aster vialis that is not documented in the applicant's report. This impact is avoidable. Much larger potential enhancement areas of oak woodland and oak savanna are present on the site. The "degraded under-stories" of these areas

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would best be enhanced for additional *Aster vialis* habitat. *Cimicifuga elata* habitat is larger than mapped in Figure 5A, and insufficient unimpacted areas are provided outside the footprint of streets, houses and cleared lots for protection of this species on this site.

2) It is unwise to assume that salvage transplantation of rare perennial plants, especially *Aster vialis* is feasible. A nearby neighbors' past attempts to dig up and relocate specimens of this species indicate a high mortality rate. Likewise I am unaware of anyone who has successfully salvaged *Cimicifuga elata*, and I strongly suspect that efforts to transplant other adults, even smaller ones without flowers or fruits, would meet with similarly unfortunate results. In my best professional judgment the rare plants are not reproducing by seed on this site because heavy Douglas fir and big leaf maple shade restricts their ability to flower and set seed. To propose transplantation of these elements to small patches of ground where they would have to compete in similar light conditions is to propose their eventual local demise due to lack of seed production and replacement. No discussion of transplantation to larger areas and areas with greater exposure to sun is to be found in the portions of Exhibit 4 devoted to mitigation and enhancement of impacted natural resources .

CONCLUSIONS: In addition to proposing salvage transplantation of individual *Aster vialis* and *Cimicifuga elata* plants, the applicant's mitigation and enhancement plan should include harvesting sufficient seed from nearby wild reproductive populations of both *Aster vialis* and *Cimicifuga elata*. The mitigation and enhancement plan should specify growing out seedlings that can be reared in a controlled situation until mature and healthy enough to attempt to locate in the proposed or hopefully enlarged salvage areas. Considering a possible 1-2% survivorship in the wild, at least 100 healthy, robust juvenile plants should be produced and planted in a large enough area to insure success of a greater number of replacement plants than each adult that would be impacted by urban development on this site. The applicant's mitigation and enhancement plan should specify the production and management of protection area light conditions that are likely to enable the rare plants to successfully reproduce by seed.

3) What is described by the applicant's consultants as an existing Oak/Douglas-fir/bigleaf maple plant community on figure 5B and Douglas fir/oak/bigleaf maple plant community in the text is actually an overgrown oak savanna and oak woodland, according to my analysis of openings apparent in the applicant's historic aerial photographs (Exhibit 4, figures 8-12) of site vegetation, especially the clearest, most complete 1952 image. This is confirmed by larger stemmed (20") and some multiple stemmed oaks occurring in the area and oaks being listed in the figure legends as the dominant species for this area. Oak woodland and oak savanna are globally endangered and imperiled plant communities in Oregon, according the Oregon Natural Heritage program's classifications. While endangered plant communities are not afforded local, state or federal legal protection that endangered plant and animal occurrences get, it should be noted that the observed *Aster vialis* mentioned above occurs on the southern edge of the Oak-Douglas fir/big leaf maple plant community. *Aster vialis* would clearly benefit from expanded and enhanced habitat further north and west from the occurrence I report here. In the absence of measures to restore, enhance and maintain this community type, both the occurrence of the rare plant and the endangered plant community that supports it will be locally extirpated. The common areas in this part of the site are not afforded similar mitigation and enhancement plans that the Oak/madrone/Douglas-fir native plant communities obtain for a small areas only in Exhibit 4, Figures 5B and 5D. The reported arborist's comments were that the trees in the northern portion are in the poorest condition. This probably refers to small sized secondary growth of Douglas fir and big leaf maple, not oaks. The much slower growing oaks obtain 7-20 inch diameters, occasionally in clusters, and may reasonably be considered older than the other subdominant species in this area.

CONCLUSIONS: Additional protection and enhancement measures are needed (and could be applied to at least 2.3 acres) in the north and eastern Oak/Douglas fir/big leaf maple native plant communities' commons areas of the development to those measures described for the narrowest

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and most isolated south and west portions for the Oak/madrone/Douglas-fir native plant community. Doing so would provide the Aster vialis population along Dillard Road with significant additional acreage along the northern and eastern areas of the parcel to colonize. While this patch of plants is reproductive, it is small in numbers and extent. Both could be increased if greater areas along Dillard Road and in the northern woods were restored to Oak savanna and oak woodland with grassy openings.

4) The applicant does not provide reasons for declaring the portion of the Oak/madrone/Douglas fir plant community in the common areas along the southwestern edges as "no thinning in this area-protect all trees" (Exhibit 4, Figure 6, detail map C). Either it is a good idea to thin the entire area to enhance it, or it is not a good idea. Thinning only the smallest trees and in the most isolated or impacted areas does not adequately mitigate the losses that this plant community will sustain should the streets and houses be built to the extent that the applicant proposes, and should succession continue to shade the oaks and madrones. Rather, not thinning this area of larger Douglas fir trees growing in denser stands would appear to pose multiple risks including continuing plant succession that extirpates the oak/madrone woodland as it is shaded by fir trees, greater risk of fire, less acreage of oak/madrone woodland being extant than at present, and the largest portions of this plant community left in a degraded and shaded condition.

CONCLUSIONS: A more aggressive and comprehensive plan is needed to insure the continued existence of an oak-madrone component of the southern upland plant community elements. Not only is thinning needed in areas marked "no thinning", but possibly more aggressive thinning is needed in situations where density of larger Douglas fir will pose a shading threat for the other tree species.

5) The applicant fails to describe mitigation and enhancement standards or how longer-term maintenance or monitoring of enhanced plant communities, salvaged rare plant occurrences, or riparian improvements. There is no discussion of how the work described in Exhibit 4 would be scheduled, funded and achieved. The applicant's consultant writes with an assumption that the applicant intends to salvage rare plants, where in the path of development, to smaller areas, to sow exposed areas with native plants after removing small Douglas-fir trees in scattered Oak dominated areas, to place a mixture of boulders, logs and root wads in the down-cut water channels, to establish grassy swales for storm water outfalls, to bury utility lines in common areas and then to re-vegetate those excavations, and to build a seasonally dry storm water detention pond. When will these actions happen, by whom, to whom will the actions be accountable and how will the actions be reported and evaluated? How will anyone know that any of these outlined measures are successful or need to be redone or further adjusted, or that the proposed mitigations and enhancements have been undertaken? Who will make sure that the applicant undertakes the proposed (and hopefully modified as per these comments) protection, mitigation and enhancement measures?

CONCLUSIONS: The applicant should be submitting written success standards and criteria for mitigation efforts as well as an appropriate construction, maintenance and monitoring schedule in a memorandum of understanding signed by the applicant and an agency to whom regular monitoring reports will be provided and to whom responsibility for oversight of the actions will reside, and who would have clearly specified legal recourse should the applicant fail to undertake the proposed actions. The applicant should specify a method for funding the production of such scheduled studies and reports as well as making assurances such as a performance bond, allowing sufficient funding needed for contingency measures should the preset standards and criteria not be met. A signed memorandum of understanding or submitted details of the proposed development's codes, covenants and restrictions should specify the entity or entities who will make the decisions regarding management, upkeep, recourse if yards are landscaped in a manner contrary to the discussion in Exhibit 4, removal of timber, water resources issues, back yard

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structures, dumping, fire/storm hazards removal, etc. that could occur over time in the lots and common areas for the proposed development.

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