Appendix I. Fungi species currently included in BLM CA or OR/WA Special Status or Forest Service Regions 5 or 6 Sensitive Species Programs

OVERVIEW

This Appendix covers the 66 species listed as Sensitive by the Forest Service Regions 5 or 6, or California or Oregon/Washington BLM. Information reflected in this Appendix represents the most current information; however information is constantly collected for these species and updates may be necessary. For each species, specific information is listed regarding the species taxonomy, ecological function, references regarding species description, habitat associations, range, relative abundance, distribution, and other management considerations (in addition to those listed in the main text of the document).

"Habitat Associations" (II.A) mainly covers habitat as known in the Northwest Forest Plan area of Washington, Oregon, and California. For some species, there may be more extensive discussion about habitat within Oregon and/or Washington. This information is derived from a thorough review of all of the available vegetation and elevation data for all known sites in Oregon and Washington for these species. That information comes from CVS plot surveys, Known Site Surveys, and any site information collected from pre-project or other survey efforts. Elevations are presented as a range, with average elevation listed in parantheses.

"Relative Abundance" (II.C) presented for each species was obtained from a GeoBOB (BLM database, but includes Region 6 site information as well) query in December 2006, supplemented by a Region 5 Forest Service query. Relative Abundance is presented in the generalized categories of " Less than 10 known sites", " 10-50 known sites", " 51-100 known sites" etc. reflecting the uncertainty that exists when determining exact numbers of known fungal sites.

Under item II. D. in each species account, a reference is made as to whether any locations of the species were found during the "Random Grid CVS/FIA plot surveys" (also known as the Random Multi-Species (RMS) survey). The Random Grid CVS/FIA plot survey was a coarse, landscape scale study covering the Northwest Forest Plan (NWFP) area of Washington, Oregon, and California. A total of 658 randomly selected fungi plots were sampled. At each plot, 0.1 ha were sampled for epigeous fungi and 0.01 ha were sampled for hypogeous fungi. The study was intended to help determine: unbiased detection estimates; late-successional old growth association or not; and association with reserve or non-reserve lands. In addition, the study was to help expand our knowledge of range and distribution of these species. For those species found on any of these 658 plots, an estimate of abundance was made for the species across the NWFP area. Interpretations of these results and estimates by BLM Oregon and Region 6 Forest Service are ongoing.

REFERENCES USED

Information presented for each species in this Appendix is drawn from a variety of sources:

- Arora, D. 1986. Mushrooms demystified. Berkeley, CA: Ten Speed Press. 959 p.
- Castellano M. and Turley M. 2005. Random Grid Surveys for Fungal Species in the Pacific Northwest. Draft report submitted to the Survey & Manage Program, USDA

Forest Service and USDI Bureau of Land Management, Portland, Oregon.

- GeoBOB query (BLM Oregon/Washington database; also contains FS Region 6 fungi information), December 2006.
- Oregon Natural Heritage Information Center. 2007. Accessed 7/3/07 at http://oregonstate.edu/ornhic/nonvasc.xls
- Region 5 Forest Service fungi dataset query, April 2006.
- Strategic Surveys for Rare and Cryptic Species in the Northwest Forests of Western Washington, Western Oregon, and Northern California, PNW-GTR, Portland, Oregon. In preparation.
- USDA Forest Service, Pacific Northwest Research Station.1999. Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. General Technical Report PNW-GTR-476.
- USDA Forest Service, Pacific Northwest Research Station 2003. Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. General Technical Report PNW-GTR-572.

If additional references were used specific to a particular species, those are listed in the species account.

Some species have undergone recent taxonomic revisions. Those revisions are listed in the species accounts, with the correct name or update identified. In addition, in the following list of species covered in this appendix, the updated or corrected name is also identified, within parentheses.

SPECIES COVERED IN THIS APPENDIX

SPECIES

1. *Albatrellus avellaneus*
2. *Albatrellus caeruleoporus*
3. *Albatrellus ellisii*
4. *Albatrellus flettii*
5. *Alpova alexsmithii*
6. *Arcangeliella camphorata*
7. *Boletus haematinus*
8. *Boletus pulcherrimus*
9. *Bridgeoporus nobilissimus*
10. *Choiromyces venosus*
11. *Clavariadelphus ligula*
12. *Clavariadelphus occidentalis*
13. *Clavariadelphus sachalinensis*
14. *Clavulina castanopes* var. *lignicola*
15. *Clitocybe subditopoda*
16. *Collybia (Dendrocollybia) racemosa*
17. *Cordyceps ophioglossoides*
18. *Cortinarius barlowensis*
19. *Cudonia monticola*
20. *Dermocybe humboldtensis*

21. *Destuntzia rubra*
22. *Entoloma nitidum*
23. *Gastroboletus imbellus*
24. *Gomphus bonarii* (*Turbinellus floccocus*)
25. *Gomphus kauffmanii*
26. *Gymnomyces nondistincta*
27. *Gymnopilus punctifolius*
28. *Gyromitra (Pseudorhizina) californica*
29. *Hydropus marginellus*
30. *Leucogaster citrinus*
31. *Martellia (Cystangium) idahoensis*
32. *Mycena quinaultensis*
33. *Octavianina (Octaviania) macrospora*
34. *Otidea smithii*
35. *Phaeocollybia attenuata*
36. *Phaeocollybia californica*
37. *Phaeocollybia dissiliens*
38. *Phaeocollybia fallax*
39. *Phaeocollybia gregaria*
40. *Phaeocollybia olivacea*
41. *Phaeocollybia oregonensis*
42. *Phaeocollybia piceae*
43. *Phaeocollybia pseudofestiva*
44. *Phaeocollybia scatesiae*
45. *Phaeocollybia sipei*
46. *Phaeocollybia spadicea*
47. *Polyozellus multiplex*
48. *Ramaria amyloidea*
49. *Ramaria araiospora*
50. *Ramaria aurantiisiccescens*
51. *Ramaria cyaneigranosa*
52. *Ramaria gelatiniaurantia*
53. *Ramaria largentii*
54. *Ramaria rubrievanescens*
55. *Ramaria rubripermanens*
56. *Ramaria spinulosa* var. *diminutiva*
57. *Ramaria stuntzii*
58. *Rhizopogon chamaleontinus*
59. *Rhizopogon ellipsosporus*
60. *Rhizopogon exiguus*
61. *Sarcodon fuscoindicus*
62. *Sowerbyella rhenana*
63. *Sparassis crispa*
64. *Spathularia flavida*
65. *Thaxterogaster pavelekii*
66. *Tricholomopsis fulvescens*

1. *Albatrellus avellaneus* Pouzar

Family: Scutigeraceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Polypore

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs principally in coastal Sitka Spruce (50%) and Western Hemlock (38%) series, old growth forest, at elevations of 112-1094 (411) feet. Fruits October-January.
B. Range: Endemic to the coastal lowlands of Oregon and Washington along the Pacific coast. Historic site in California was located in a coastal redwood site in Humboldt County; site was logged in 1956, unknown if still extant.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): WA Western Lowlands and Olympic Peninsula; OR Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Albatrellus avellaneus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

2. *Albatrellus caeruleoporus* (Peck) Pouzar

Family: Scutigeraceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Polypore

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat: Presumed mycorrhizal with *Tsuga* spp. Fruits September-November.
B. Range: A portion of the NWFP area in Washington, Oregon, and California. Also known from the northeastern U.S.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites: mainly in California, disjunct sites in Oregon and in Washington.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula, Western Lowlands, Western Cascades North of Snoqualmie Pass; OR Coast Range and Western Cascades; CA Coast Range. There was 1 detection of this species during Random Grid CVS/FIA plot surveys: Mt Hood NF in Oregon.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Albatrellus caeruleoporus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

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3. *Albatrellus ellisii* (Berk.) Pouzar

Family: Scutigeraceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Polypore

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Solitary, scattered, gregarious, or in fused clusters in forests on mineral soil, litter and humus. Under conifers or mixed coniferous forests associated with *Abies, Picea, Pinus, Pseudotsuga, Tsuga* or *Castanopsis*. Fruits October-January. In Oregon and Washington: occurs principally in White Fir series (52%). Associated species include white fir, Pacific silver fir, noble fir, Shasta red fir, lodgepole pine, western white pine, sugar pine, ponderosa pine, Douglas fir, Engelmann spruce and western hemlock, at elevations of 558-5646 (4529) feet. Other woody associates include *Amelanchier alnifolia, Arcostaphylos nevadensis, Berberis nervosa, Castanopsis chrysophylla, Ceanothus prostratus, Ceanothus velutinus, Chimaphila umbellata, Gaultheria shallon, Linnaea borealis* and *Pachistima myrsinites*.
B. Range: Within a portion of the NWFP area of Washington, Oregon, and California. Also known outside the NWFP area near the California coast in Jackson State Forest, Mendocino County.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 sites
D. Distribution (Physiographic Provinces): WA Eastern Cascades and Western Cascades south of Snoqualmie Pass and Olympic Peninsula; OR Eastern Cascades, Western Cascades and Klamath Mountains; CA Klamath There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Albatrellus ellisii* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

4. *Albatrellus fletti* (Morse) Pouzar

Family Scutigeraceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Polypore

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Scattered to gregarious or in fused clusters. Under conifers or mixed coniferous forests associated with *Abies*, *Picea*, *Pinus*, *Pseudotsuga*, *Thuja*, and *Tsuga*. Fruits August-November.
B. Range: Endemic to a portion of the NWFP area of Washington, Oregon, California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 sites
D. Distribution (Physiographic Provinces): WA all NWFP provinces except Olympic Peninsula; OR Western Cascades and Eastern Cascades; CA Coast Range and Klamath. There were 2 detections of this species during Random Grid CVS/FIA plot surveys: Okanogan NF in Washington and the Willamette NF in Oregon.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Albatrellus flettii* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

5. *Alpova alexsmithii* Trappe

Family: Boletaceae
Ecological Function: Mycorrizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs principally on soil in Pacific Silver Fir (44%) and Mountain Hemlock (44%) series at elevations of 2742-5764 (4851) feet. A mycorrhizal associate of *Tsuga*. Associated species include Pacific silver fir, lodgepole pine, Engelmann spruce and mountain hemlock. Other woody associates include *Vaccinium membranaceum* and *Vaccinium scoparium*. Fruits August-December.
B. Range: A portion of the NWFP area in Oregon and Washington. Also known from British Columbia.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades south of Snoqualmie Pass; OR Western Cascades and Eastern Cascades. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Alpova alexsmithii* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

6. *Arcangeliella camphorata* (Singer & Smith) Pegler & Young

Family: Russulaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0;
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs principally in soil and litter in Western Hemlock (44%), Tan Oak (31%) and Sitka Spruce (19%) series at elevations of 20-3039 (1418) feet. Associated species include Douglas fir, western hemlock, Pacific madrone, and incense cedar. Other woody associates include *Acer circinatum, Berberis nervosa* and *Vaccinium ovatum*. Fruits March-November.
B. Range: A portion of the NWFP area in Washington and Oregon. Also known from British Columbia.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites**.** In Washington there are three collections from the Olympic Peninsula. From Oregon, there are numerous collections from 3 blocks of forest near Pistol River, though the integrity of some of these is now in question because of the Biscuit Fire.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula; OR Coast Range and Klamath. There were 2 detections of this species during Random Grid CVS/FIA plot surveys: Coos Bay BLM District and Siskiyou NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Arcangeliella camphorata* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

7. *Boletus haematinus* Thiers & Halling

Family: Boletaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Bolete

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with roots of *Abies* spp., particularly *A. magnifica* in the Sierra Nevada mountains, and *A. lasiocarpa* in Washington, in subalpine forests (cool and wet). Fruits August-October.
B. Range: In a portion of the NWFP area of Washington and Oregon. Also from the Sierra Mountains outside the NWFP area in California.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): WA Eastern Cascades; OR Western Cascades and Eastern Cascades. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Boletus haematinus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

8. *Boletus pulcherrimus* Thiers & Halling

Family: Boletaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Bolete

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: In humus, associated with the roots of mixed conifers (for example *Abies grandis, Pseudotsuga menziesii*), and hardwoods (*Lithocarpus densiflorus*). Fruits in July-December.
In Oregon and Washington: occurs principally on mineral soil and humus in White Fir series (36%) at elevations of 62-5735 (4231) feet. Associated species include grand fir, Douglas fir, tan oak and bigleaf maple. Other woody associates include *Acer circinatum*.
B. Range: A portion of the NWFP area in Washington, Oregon, and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades and Western Lowlands; OR Willamette Valley, Western Cascades and Eastern Cascades; CA Coast Range and Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species *Boletus pulcherrimus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

9. *Bridgeoporus nobilissimus* (W.B.Cooke) Volk, Burdsall & Ammirati

Family: Polyporaceae
Ecological Function: Wood saprobe

I. SPECIES DESCRIPTION

Morphological Habit
Polypore

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs principally in Pacific silver fir (73%) and Western Hemlock (23%) series on noble fir and true fir decadent trees, snags, and stumps greater than 1 meter dbh. Species occurs at elevations of 298-4328 (3354) feet, lower in Washington and at higher elevations in Oregon (above 2800' in Oregon). Other woody associates include Douglas fir and Vaccinium sp. Sporocarp is visible yearlong.
B. Range: A portion of the NWFP area in Washington and Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites (with about +/-112 fruiting bodies total).
D. Distribution (Physiographic Provinces): WA Western Cascades and Olympic Peninsula; OR Coast Range and Western Cascades;. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a wood saprobe, *Bridgeoporus nobilissimus* probably does not extend much beyond the available substrate (tree, stump, snag). A recent study identified *Bridgeoporus nobilissimus* DNA in the soil, only within five feet of an occupied stump. Retention of habitat patches across a landscape could provide possible areas of refugia and potential areas for colonization**.** Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

For I, IIA, B, & D: Cowden, M. M. 2002. A study of the current range and habitat of Fuzzy Sandozi Conks (*Bridgeoporus nobilissimus*) throughout Pacific Northwest forests. MS Thesis, Oregon State University.

Burdsall, H.H., T.J. Volk and J.F. Ammirati. 1996. Bridgeoporus, a new genus to accomodate Oxyporus nobilissimus. Mycotaxon 60:387-395.

Gordon, Matt. 2007. Results of Soil Testing for *Bridgeoporus nobilissimus* DNA near a Host Stump. Unpublished report to Kelli VanNorman, USDI BLM, Oregon State Office and USDA Forest Service, Region 6 Regional Office, Portland, Oregon.

Redberg, G.L. , D.S. Hibbett, J.F. Ammirati, R.J. Rodriguez. 2003. Phylogeny and genetic diversity of *Bridgeoporus nobilissimus* inferred using mitochondrial and nuclear rDNA sequences. Mycologia 95(5): 836-845.

10. *Choiromyces venosus* (Fries) Th. Fries

Family: Tuberaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with various Pinaceae spp., particularly *Pseudotsuga menziesii* and *Tsuga heterophylla* in low elevations. Fruits in October.
B. Range: A portion of the Northwest Forest Plan area of Oregon and California. Also widely distributed in Europe, and known from West Virginia.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): OR Western Cascades, CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Choiromyces venosus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

11. *Clavariadelphus ligula* (Schaeff.: Fr.) Donk

Family: Clavariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Club fungi

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Association: Scattered to gregarious on soil or duff, under coniferous or mixed coniferous associated with *Abies*, *Calocedrus*, *Pinus*, *Pseudotsuga*, *Thuja*, *Tsuga*, *Umbellularia*, *Arbutus* and *Castanopsis.* Fruits July-December.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): WA all NWFP provinces *except* Western Cascades North; OR all NWFP provinces; CA Coast Range, Cascades. There were 4 detections of this species during Random Grid CVS/FIA plot surveys: Coos Bay BLM District, Willamette and Winema NFs in OR, and the Gifford Pinchot NF in WA.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species *Clavariadelphus ligula* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Methven, A.S. 1990. The genus *Clavariadelphus* in N. America. Berlin, Cramer.192 p.

12. *Clavariadelphus occidentalis*

Family: Clavariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Club fungi

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Fruits through winter, and in May.
In Oregon and Washington: on litter, humus, mineral soil, principally in Western Hemlock series (47%) at elevations of 332-4497 (2073) feet. Associated species include Pacific silver fir, white fir, grand fir, incense cedar, sugar pine, western white pine, ponderosa pine, Douglas fir, Pacific yew, western red cedar, Port Orford cedar, western hemlock, bigleaf maple, red alder, Pacific madrone, tan oak, canyon live oak and California black oak. Other woody associates include *Acer circinatum, Berberis nervosa, Berberis peperiana, Castanopsis chrysophylla, Chimaphila umbellata, Cornus sp., Gaultheria shallon, Holodiscus discolor, Linnaea borealis, Rhododendron macrophyllum, Rosa gymnocarpa, Rubus nivalis, Rubus ulmifolius, Vaccinium membranaceum, Vaccinium ovatum, Vaccinium parvifolium* and *Whipplea modesta*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): All provinces in the NWFP area *except* WA Eastern Cascades and Western Lowlands, and CA Cascades. There were 9 detections of this species during Random Grid CVS/FIA plot surveys: Coos Bay and Salem BLM Districts, and Siuslaw, Umpqua and Willamette NFs in OR, Mt. Baker-Snoqualmie NF in WA, and Six Rivers NF in CA.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Clavariadelphus occidentalis* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Methven, A.S. 1990. The genus *Clavariadelphus* in N. America. Berlin, Cramer.192 p.

13. *Clavariadelphus sachalinensis* (Imai) Corner

Family: Clavariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Club fungi

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Scattered to gregarious on soil, litter, conifer wood. Fruits June-October.

In Oregon and Washington: principally in Douglas Fir (42%) and Western Hemlock (30%) series at elevations of 152-5352 (2706) feet. Associated species include white fir, subalpine fir, incense cedar, Engelmann spruce, sugar pine, ponderosa pine, Douglas fir, canyon live oak, California black oak and Pacific madrone. Other woody associates include *Berberis nervosa, Berberis piperiana, Chimaphila umbellata, Rhus diversiloba,* and *Whipplea modesta*.

B. Range: A portion of the Northwest Forest Plan area in Washington and Oregon. In California, located outside the NWFP area near the coast in Jackson State Forest, Mendocino County.

C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.

D. Distribution (Physiographic Provinces): All OR/WA provinces in NWFP area *except* WA Olympic Peninsula and OR Williamette Valley. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Clavariadelphus sachalinensis* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Methven, A.S. 1990. The genus *Clavariadelphus* in N. America. Berlin, Cramer.192 p.

14. *Clavulina castanopes* var. *lignicola*

Family: Clavariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Club fungi

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat associations: On wood or bark. Fruits in autumn.
B. Range: A portion of the Northwest Forest Plan area in Washington and Oregon. In California, located outside the NWFP along and near the coast.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA all NWFP provinces *except* Eastern Cascades; OR Coast Range. There were 13 detections of this species during Random Grid CVS/FIA plot surveys: Gifford Pinchot and Olympic NFs in WA, and Siuslaw NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Clavulina castanopes* var. *lignicola* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

15. *Clitocybe subditopoda* Peck

Family: Tricholomataceae
Ecological Function: Litter saprobe

I. SPECIES DESCRIPTION:

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. **Habitat Associations**: In fairy rings on needle beds of *Picea* and *Pinus* spp., coastal to mid-elevation forests. Fruits October-December.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Cascades; OR Coast Range and Western Cascades; CA Coast Range. There were 3 detections of this species during Random Grid CVS/FIA plot surveys: Gifford Pinchot and Olympic NFs in WA, and Six Rivers NF in CA.

III. OTHER MANAGEMENT CONSIDERATIONS

As a litter saprobe, *Clitocybe subditopoda* may be associated with forest litter, duff or debris. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

16. *Collybia racemosa* (Pers.: Fr.) Quélet / *Dendrocollybia racemosa*** (Pers. Fr) R.H. Peterson & Redhead

Family Tricholomataceae
Ecological Function: Litter saprobe
****** This is a new name for this taxon (comb.nov.) based on DNA work by Hughes et al., 2001 Mycological Research 105: 164-172.

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Gregarious, on rotting or mummified remnants of agarics or seldom in nutrient-rich leaf mulch, in forests. Fruits in autumn.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California. In California also known to occur in the Sierra Nevada Range.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA all NWFP provinces *except* Eastern Cascades; OR all NWFP provinces *except* Willamette Valley; CA all NWFP provinces. There were 4 detections of this species during Random Grid CVS/FIA plot surveys: Siuslaw NF in OR, and the Six Rivers, Klamath, and Shasta Trinity NF in CA.

III. OTHER MANAGEMENT CONSIDERATIONS

As a litter saprobe, *Dendrocollybia racemosa* may be associated with forest litter, duff or debris. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Noordeloos, M. E. 1995. *Collybia*. In: eds. Bas, C.; Kuyper, Th.W.; Nordeloos, M.E.; Vellinga, E.C. Flora Agaricina Neerlandica. Volume 3. The Netherlands, Rotterdam : 106-123.

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka CA.

17. *Cordyceps ophioglossoides* (Fr.) Link

Family Clavicipitaceae
Ecological Function: Parasite

I. SPECIES DESCRIPTION

Morphological Habit
Earth tongue

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Parasitic on various *Elaphomyces* species, including *E. cervinus, E. granulatus, E. muricatus,* and *E. variegatus.* Fruits in autumn.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Cascades; OR Coast Range and Western Cascades; CA Coast Range. There was 1 detection of this species during Random Grid CVS/FIA plot surveys; on the Mount Baker Snoqualmie NF in WA.

III. OTHER MANAGEMENT CONSIDERATIONS

As a parasitic species *Cordyceps ophioglossoides* feeds on a living host. Parasitic fungi included in this conservation assessment are obligate parasites, and will not survive without the living host tissue (see Alexopoulos *et al.* 1996 for additional information). To provide reasonable assurance of continued persistence to occupied sites and to provide for the parasitic host, consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

18. *Cortinarius barlowensis* Ammirati and Moser sp. nov, ined.

Family Cortinariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Solitary to gregarious. Fruits in autumn.
In Oregon and Washington: principally in montane Pacific silver fir (44%) and coastal Western Hemlock (28%) series at elevations of 25-4729 (2416) feet. Associated species include Pacific silver fir, mountain hemlock and western hemlock. Other woody associates include *Berberis nervosa, Gaultheria shallon, Oplopanax horridum, Rhododendron macrophyllum, Vaccinium alaskaense, Vaccinium membranaceum and Vaccinium alaskaense*.
B. Range: A portion of the Northwest Forest Plan area in Washington and Oregon; in California known from outside the NWFP area, along the California Coast.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Cascades; OR Coast Range and Western Cascades. There were 17 detections of this species during Random Grid CVS/FIA plot surveys: Gifford Pinchot, Mt. Baker-Snoqualmie and Olympic NFs in WA, and Willamette NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Cortinarius barlowensis* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Bidaud, A.; Henry, R.; Moënne-Loccoz, P.; Reumaux, P. 1992. Atlas des *Cortinaires*, Part IV. France, Annecy: Ed. Fëdër. Mycol. Dauph.-Savoie.

19. *Cudonia monticola* Mains

Family Geoglossaceae
Ecological Function: Litter saprobe

I. SPECIES DESCRIPTION

Morphological Habit
Earth tongue

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: On *Picea* sp. needles and coniferous debris. Fruits late summer and autumn.
In Oregon and Washington: on litter and rotten wood, principally in Western Hemlock series (58%) at elevations of 523-5994 (2556) feet. Associated species include Pacific silver fir, white fir, grand fir, subalpine fir, red fir, noble fir, Engelmann spruce, Douglas fir, western red cedar, western hemlock and mountain hemlock. Other woody associates include Acer circinatum, *Acer glabrum, Berberis nervosa, Castanopsis chrysophylla, Gaultheria shallon, Holodiscus discolor, Rhododendron albiflorum, Rhododendron macrophyllum, Rubus parvifolium, Rubus spectabilis, Vaccinium membranaceum* and *Whipplea modesta*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California. In California, also known outside the NWFP area near the California coast and in the Sierra Nevada.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades and Eastern Cascades; OR Coast Range, Western Cascades, Eastern Cascades and Klamath; CA Klamath. There were 6 detections of this species during Random Grid CVS/FIA plot surveys: Mt. Baker-Snoqualmie and Wenatchee NFs in Washington, and Siskiyou, Siuslaw and Willamette NFs in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a litter saprobe, *Cudonia monticola* may be associated with forest litter, duff or debris. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

20. *Dermocybe humboldtensis* (Ammirati & A.H.Smith) Ammirati

Family: Cortinariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Appears restricted to stable dunes in association with *Pinus* spp. Fruits November-December.
In Oregon: occurs in Douglas Fir (50%) and Grand Fir (50%) series at elevations of 1353-1956 (1526) feet. Associated species include Douglas fir and ponderosa pine.
B. Range: A portion of the Northwest Forest Plan area in Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): OR Coast Range and Klamath; CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Dermocybe humboldtensis* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

21. *Destuntzia rubra* (Harkness) Fogel & Trappe

Family: Cortinariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with roots of *Abies grandis*, *Arbutus menziesii*, *Lithocarpus densiflorus*, *Pseudotsuga menziesii* and *Sequoia sempervirens* below 650 m elevation. Fruits mostly yearlong.
B. Range: A portion of the Northwest Forest Plan area in California. Also historically known from Linn County, Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Destuntzia rubra* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

22. *Entoloma nitidum* (*Rhodocybe nitida)* (Quelet) Baroni & Largent, in ed.

Family: Entolomataceae
Ecological Function: Litter Saprobe

I. SPECIES DESCRIPTION:
Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS
A. Habitat Associations: In duff under conifer or mixed conifer-hardwood forests. Fruits July-November.
B. Range: A portion of the Northwest Forest Plan area in Washington and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Cascades; CA Coast Range. There were 2 detections of this species during Random Grid CVS/FIA plot surveys: Gifford Pinchot NF in WA.

III. OTHER MANAGEMENT CONSIDERATIONS
As a litter saprobe, *Entoloma nitidum* may be associated with forest litter, duff or debris. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

23. *Gastroboletus imbellus* Trappe

Family: Boletaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs in Pacific Silver Fir (50%) and Mountain Hemlock (50%) series at elevations of 2528-5169 (3849) feet. Associated with roots of grand fir, subalpine fir and mountain hemlock. Fruits in October.
B. Range: A portion of the Northwest Forest Plan area in Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): OR Cascades West. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Gastroboletus imbellus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

24. *Gomphus bonarii* (Morse) Singer **

Family Gomphaceae
Ecological Function: Mycorrhizal
** Note: A taxonomic revision has placed *Gomphus bonarii* in the genus *Turbinellus* as *Turbinellus floccosus*, ((Schwein) Earle), Giachini 2004.

Recent molecular investigations by Dr. Admir Giachini (most recently of Oregon State University) demonstrate (according to Dr. Lorelei Norvell) that: " *Gomphus clavatus*, the type of the genus, is separated from the scaly vase chanterelles, which were listed in the Survey and Manage Record of Decision as *Gomphus bonarii, Gomphus floccosus*, and *Gomphus kauffmanii*. Those taxa will be referred to the genus *Turbinellus*, erected by Earle in 1909. Dr. Giachini's research convincingly demonstrates that *Gomphus bonarii* is a synonym of *Turbinellus* (formerly *Gomphus*) *floccosus.* In summary:

- *Gomphus floccosus* is best represented as *Turbinellus floccosus* (Schw.) Earle 1909.
- *Gomphus bonarii* is a synonym of *Turbinellus floccosus* and so all ISMS data entered should be transferred to the old GOFL data.
- *Gomphus kauffmanii*, which will be transferred to the genus *Turbinellus* appears to remain relatively uncommon.

(L. Norvell, Electronic communication 06.29.2004 with Kelli VanNorman, among others)

As a mycorrhizal species, *Turbinellus floccosus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. This species is relatively common, and is not included on Agency Special Status or Sensitive Species Lists.

IV. ADDITIONAL REFERENCES

Singer, R. 1945. New genera of fungi. Lloydia. 8:139-144.

Giachini, A. 2004 Systematics, phylogeny, and ecology of *Gomphus sensu lato*. Ph.D. thesis, Oregon State Univerisity, 466 pp. (Available from University Microfilms)

25. *Gomphus kauffmanii* (Smith) Petersen (See taxonomic discussion below under OTHER MANAGEMENT CONSIDERATIONS)

Family Gomphaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Chanterelle

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Closely gregarious to caespitose in deep humus, litter, soil, wood or moss under pines or firs. Fruits in autumn.
In Oregon and Washington: occurs primarily in Pacific Silver Fir (31%), Mountain Hemlock (27%) or Western Hemlock (24%) series at elevations of 202-6824 (3770) feet. Associated species include Pacific silver fir, subalpine fir, Shasta red fir, Noble fir, lodgepole pine, Douglas fir, Pacific yew, western red cedar, western hemlock, mountain hemlock, Pacific dogwood and oak species. Other woody associates include *Acer circinatum, Castanopsis chrysophylla, Cornus canadensis, Gaultheria shallon, Vaccinium alaskaense, Vaccinium membranaceum* and *Vaccinium scoparium*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): WA all NWFP provinces; OR all NWFP provinces except Willamette Valley; CA all NWFP provinces. There were two detections of this species during Random Grid CVS/FIA plot surveys: Willamette NF in OR, and Shasta Trinity NF in CA.

III. OTHER MANAGEMENT CONSIDERATIONS

Recent molecular investigations by Dr. Admir Giachini (most recently of Oregon State University) demonstrate (according to Dr. Lorelei Norvell) that: " *Gomphus clavatus*, the type of the genus, is separated from the scaly vase chanterelles, which were listed in the Survey and Manage Record of Decision as *Gomphus bonarii*, *Gomphus floccosus*, and *Gomphus kauffmanii*. Those taxa will be referred to the genus *Turbinellus*, erected by Earle in 1909. Dr. Giachini's research convincingly demonstrates that *Gomphus bonarii* is a synonym of *Turbinellus* (formerly *Gomphus*) *floccosus*. In summary:

- *Gomphus floccosus* is best represented as *Turbinellus floccosus* (Schw.) Earle 1909.
- *Gomphus bonarii* is a synonym of *Turbinellus floccosus* and so all ISMS data entered should be transferred to the old GOFL data.
- *Gomphus kauffmanii*, which will be transferred to the genus *Turbinellus* (not yet formally published) appears to remain relatively uncommon.

(L. Norvell, Electronic communication 06.29.2004 with Kelli VanNorman, among others)

As a mycorrhizal species, *Gomphus kauffmanii* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Singer, R. 1945. New genera of fungi. Lloydia. 8:139-144.

26. *Gymnomyces nondistincta* Trappe & Castellano, in ed.

Family: Russulaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with roots of Pacific silver fir and mountain Hemlock in Mountain Hemlock (50%) and Parkland (50%) series at elevations of 5962-7126 (6544) feet. Fruits in September.
B. Range: A portion of the Northwest Forest Plan area in Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): OR Western Cascades and Eastern Cascades. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species *Gymnomyces nondistincta* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

27. *Gymnopilus punctifolius* (Peck) Singer

Family: Cortinariaceae
Ecological Function: Wood saprobe

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Well-decayed large conifer stumps, logs and snags containing brown cubical rot. Fruits autumn, winter.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon, and California.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites in CA; 51-100 in Washington and Oregon.
D. Distribution (Physiographic Provinces): WA Western Cascades; OR Western Cascades and Coast Range; CA Coast Range. There were 3 detections of this species during Random Grid CVS/FIA plot surveys: Mount Baker Snoqualmie and Olympic NFs in WA.

III. OTHER MANAGEMENT CONSIDERATIONS

As a wood saprobe, *Gymnopilus punctifolius* probably does not extend beyond the available substrate (log, stump etc). Retention of habitat patches across a landscape could provide possible areas of refugia and potential areas for colonization**.** Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

28. *Gyromitra californica* (W. Phillips) Raitviir

Family Discinaceae
Ecological Function: Wood/litter saprobe
**Species is recognized as *Pseudorhizina californica* by both the Oregon Natural Heritage Information Center and the Index Fungorum http://www.indexfungorum.org/ (accessed July 3, 2007).

I. SPECIES DESCRIPTION

Morphological Habit
Cup fungi

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: On or adjacent to well-rotted stumps or logs of coniferous trees, on litter or soil rich in brown rotted wood. Fruits in June.
In Oregon and Washington: primarily in Pacific Silver Fir (19%), Western Hemlock (17%) or White Fir (17%) series at elevations of 158-6026 (4047) feet. Associated species include Pacific silver fir, white fir, red fir, lodgepole pine, sugar pine, ponderosa pine, Douglas fir, Engelmann spruce, western red cedar, western hemlock, mountain hemlock, red alder and quaking aspen. Other woody associates include *Acer circinatum, Arctostaphylos sp. Berberis aquifolium, Castanopsis chrysophylla, Ceanothus velutinus, Chimaphila umbellata, Cornus canadensis, Linnaea borealis, Oplopanax horridum, Pachistima myrsinites, Prunus sp., Rhododendron albiflorum, Rhododendron macrophyllum, Ribes bracteosum, Rubus sp., Vaccinium alaskaense, Vaccinium membranaceum* and *Vaccinium scoparium*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon, and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA all NWFP provinces *except* Western Lowlands; OR all NWFP provinces *except* Willamette Valley; CA Cascades. There were 4 detections of this species during Random Grid CVS/FIA plot surveys: Mt. Baker-Snoqualmie and Olympic NFs in WA, and Willamette NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As either a wood or litter saprobe, *Pseudorhizina californica* may form symbiotic associations with the fine root systems of plants, growing out into the soil matrix, or it may be confined to the available substrate (log, stump etc). Consider incorporation of

patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

29. *Hydropus marginellus* (Pers.: Fr.) Singer

Family Tricholomataceae
Ecological Function: Wood/litter saprobe

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Scattered to gregarious on decaying conifer wood (*Pseudotsuga*, *Abies*, *Pinus*). Agency data records indicate fruiting from June-December.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Cascades; OR Coast Range and Western Cascades; CA Coast Range. There was 1 detection of this species during Random Grid CVS/FIA plot surveys: Mt. Baker-Snoqualmie NF in WA.

III. OTHER MANAGEMENT CONSIDERATIONS

As a wood or litter saprobe, *Hydropus marginellus* may form symbiotic associations with the fine root systems of plants, growing out into the soil matrix, or it may be confined to the available substrate (log, stump etc.). Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

30. *Leucogaster citrinus* (Harkness) Zeller & Dodge

Family: Leucogastraceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: On soil, associated with the roots of white fir, subalpine fir, lodgepole pine, western white pine, Douglas fir and western hemlock at elevations of 288-4893 (2175) feet. Fruits August-November.
In Oregon and Washington: other associated trees include Pacific silver fir, grand fir, mountain hemlock, tan oak and California laurel. Other woody associates include *Acer cinatum, Arctostaphylos nevadense, Berberis nervosa, Gaultheria shallon, Rhododendron macrophyllum, Rubus spectabilis, Vaccinium membranaceum* and *Vaccinium ovatum*
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA all NWFP provinces; OR Coast Range, Western Cascades and Klamath; CA Coast Range and Klamath. There were 33 detections of this species during Random Grid CVS/FIA plot surveys: Gifford Pinchot and Wenatchee NFs in WA, Salem BLM and Mt Hood, Siskiyou, Siuslaw, Umpqua, and Willamette NFs in OR, and Six Rivers and Klamath NFs in CA.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Leucogaster citrinus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

31. *Martellia idahoensis* A.H. Smith**

Family: Russulaceae
Ecological function: Mycorrhizal
** Note: *Martellia idahoensis* has been transferred to the genus *Cystangium* as *Cystangium idahoensis* (Singer & A.H. Smith) Trappe, Lebel, & Castellano 2002.

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with roots of Pacific silver fir, subalpine fir, Noble fir, Engelmann spruce and mountain hemlock in Pacific Silver Fir (33%), Mountain Hemlock (33%) and Western Hemlock (33%) series at elevations of 2528-4795 (3625) feet. Fruits August-October.
B. Range: A portion of the Northwest Forest Plan area in Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): OR Coast Range and Western Cascades. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Cystangium idahoensis* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Trappe, J.M., T. Lebel, and M.A. Castellano. 2002. Nomenclatural revisions in the sequestrate russuloid genera. Mycotaxon 81: 195-214.

32. *Mycena quinaultensis* Kauffman

Family: Tricholomataceae
Ecological function: Litter Saprobe

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: *Mycena quinaultensis* is often found in clusters on senescent conifer needles or uncommonly on decayed wood in conifer forests.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Lowlands; OR Western Cascades; CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a litter saprobe, *Mycena quinaultensis* may be associated with forest litter, duff or debris. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

33. *Octavianina macrospora* Singer & A.H. Smith

Family: Octavianinaceae
Ecological Function: Mycorrhizal
**Correct spelling for the Genus is *Octaviania* as recognized as by both the Oregon Natural Heritage Information Center and the Index Fungorum http://www.indexfungorum.org/ (accessed July 3, 2007).

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with western hemlock in Western Hemlock series at 3226 feet. Fruits in August.
B. Range: A portion of the Northwest Forest Plan area in Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, apparently only 1 historic site on the Mt Hood NF.
D. Distribution (Physiographic Provinces): OR Western Cascades (historic). There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Octaviania macrospora* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

34. *Otidea smithii* Kanouse

Family: Otideaceae
Ecological Function: Litter saprobe

I. SPECIES DESCRIPTION:

Morphological Habit
Cup fungi

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs on exposed soil, moss, litter or humus under Douglas fir, western hemlock, ponderosa pine, bigleaf maple, Oregon white oak and black cottonwood. Fruits August-December.
In Oregon and Washington: occurs primarily in the Western Hemlock series (83%) at elevations of 1250-3752 (1904) feet. Other woody associates include *Acer circinatum, Berberis nervosa, Linnaea borealis, Lonicera hispidula, Rhus diversiloba* and *Rubus* sp.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades; OR Coast Range, Western Cascades and Klamath; CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a litter saprobe, *Otidea smithii* may form symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible. Additional specific guidance may be under development.

IV. ADDITIONAL REFERENCES

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

35. *Phaeocollybia attenuata* (A.H. Smith) Singer

Family Cortinariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Scattered in litter, humus or soil under mixed coniferous forests or forests associated with *Pseudotsuga*, *Tsuga*, *Picea*, *Abies*, *Pinus* and *Sequoia*. Fruits September-December.
In Oregon and Washington: occurs primarily in Western Hemlock (66%), Sitka Spruce (11%) and Tan Oak (11%) series at elevations of 0-5215 (1246) feet. Associated species include Douglas fir, western hemlock, Sitka spruce, Pacific silver fir, pine species, red alder, tan oak, California laurel and coastal redwood. Other woody associates include *Acer circinatum, Berberis nervosa, Castanopsis chrysophylla, Gaultheria shallon, Holodiscus discolor, Menziesia ferruginea, Rhododendron macrophyllum, Rubus spectabilis, Symphoricarpos mollis, Vaccinium ovatum, Vaccinium parvifolium* and *Whipplea modesta*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 150-200 known sites.
D. Distribution (Physiographic Provinces): All OR/WA NWFP provinces except WA Eastern Cascades and OR Eastern Cascades; CA Coast Range and Klamath. There were 6 detections of this species during Random Grid CVS/FIA plot surveys: Olympic NF in WA, and Coos Bay BLM and Siuslaw NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia attenuata* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

36. *Phaeocollybia californica* A. H. Smith & Trappe

Family: Cortinariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs on soil, litter and humus in association with roots of Pacific silver fir, Sitka spruce, Douglas fir and western hemlock. Fruits in March, May, October and November.
In Oregon and Washington: principally occurs in Western Hemlock series (57%) at elevations of 309-3817 (1576) feet. Other tree associates include incense cedar, western red cedar, bigleaf maple, Pacific madrone, canyon live oak, Oregon white oak and California laurel. Other woody associates include *Acer circinatum, Berberis nervosa, Gaultheria shallon, Rhododendron macrophyllum* and *Vaccinium* sp.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula; OR all NWFP provinces except Eastern Cascades; CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia californica* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

37. *Phaeocollybia dissiliens* A. H. Smith & Trappe

Family: Cortinariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs on soil, litter and humus is association with roots of Pacific fir, Sitka spruce, Douglas fir and western hemlock principally in Western Hemlock series (67%) at elevations of 313-2431 (1317) feet. Other tree associates include western red cedar, bigleaf maple, red alder and California laurel. Other woody associates include *Acer circinatum, Berberis nervosa, Gaultheria shallon, Rubus subalpinus* and *Rubus ursinus*. Fruits October-November.
B. Range: A portion of the Northwest Forest Plan area in Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): OR Coast Range, Western Cascades and Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia dissiliens* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

38. *Phaeocollybia fallax* A.H. Smith

Family Cortinariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Scattered to gregarious in thick humus in mixed coniferous forests or forests associated with *Abies, Picea, Pseudotsuga, Thuja, Sequoia* and *Tsuga.* Agency database records indicate fruiting September-December.
In Oregon and Washington: occurs primarily in Western Hemlock (66%), Sitka Spruce (15%) and Pacific Silver Fir (10%) series at elevations of 0-4116 (1513) feet. Associated species include Pacific silver fir, white fir, Noble fir, Port Orford cedar, Sitka spruce, Douglas fir, western red cedar, western hemlock, coastal redwood and red alder. Other woody associates include *Acer circinatum, Berberis nervosa, Gaultheria shallon, Linnaea borealis, Prunus sp., Rhododendron macrophyllum, Rhamnus sp., Rubus spectabilis, Rubus ursinus, Vaccinium parvifolium, Vaccinium ovatum* and *Whipplea modesta*.
B. Range: A portion of the Northwest Forest Plan area inWashington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 101-150 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula, Western Lowlands and Western Cascades; OR Coast Range, Western Cascades, Klamath; CA Coast Range. There were 2 detections of this species during Random Grid CVS/FIA plot surveys: Coos Bay BLM and Umpqua NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia fallax* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

39. *Phaeocollybia gregaria* A. H. Smith & Trappe

Family: Cortinariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with the roots of Sitka spruce and Douglas fir in Sitka Spruce (50%) and Western Hemlock (50%) series at elevations of 477-1486 (776) feet. Fruits October-November.
B. Range: A portion of the Northwest Forest Plan area in Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): OR Coast Range and Western Cascades. There were no detections of this species recorded during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia gregaria* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

40. *Phaeocollybia olivacea* A.H. Smith

Family Cortinariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Scattered to gregarious, often found in arcs or fairy rings in thick humus, litter or soil in forests containing Fagaceae or Pinaceae species (*Abies, Picea, Pseudotsuga, Pinus, Calocedrus, Sequoia* and *Tsuga).* Fruits September-December.
In Oregon and Washington: occurs primarily in Western Hemlock (55%), Tan Oak (14%) and Douglas Fir (13%) series at elevations of 20-3157 (1625) feet. Associated species include Pacific silver fir, white fir, grand fir, Noble fir, incense cedar, sugar pine, Stika spruce, Douglas fir, Pacific yew, western hemlock, western red cedar, bigleaf maple, Pacific madrone, tan oak, canyon live oak, Oregon white oak and California black oak. Other woody associates include *Acer circinatum, Berberis nervosa, castanopsis chrysophylla, Gaultheria shallon, Holodiscus discolor, Linnaea borealis, Lonicera hispidula, Rhododendron sp., Rubus ursinus, Vaccinium ovatum, Vaccinium parvifolium* and *Whipplea modesta*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California. Also known from outside the NWFP area in the Sierras in California.
C. Relative Abundance: Within Northwest Forest Plan area, 101-150 known sites
D. Distribution (Physiographic Provinces): WA Olympic Peninsula; OR all NWFP provinces except Eastern Cascades; CA Coast Range and Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia olivacea* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

41. *Phaeocollybia oregonensis* A. H. Smith & Trappe

Family: Cortinariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: On soil in association with roots of Douglas fir, western hemlock and Pacific silver fir, primarily in Western Hemlock series (75%) at elevations of 826-3817 (2033) feet. Associated species include Douglas fir, western hemlock and Pacific madrone. Other woody associates include *Acer circinatum, Gaultheria shallon, Rhododendron macrophyllum* and *Vaccinium parvifolium*. Fruits October-November.
B. Range: A portion of the Northwest Forest Plan area in Washington and Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites*
D. Distribution (Physiographic Provinces): OR Coast Range, Western Cascades and Klamath.

* To date the largest number of collections (from Wildcat Mountain) were all made during only four days in October of 1994 & 1995, probably from the same mycelium (L. L. Norvell, 1998). One of those is photographed in the Strategy 1 handbook (USDA Forest Service, Pacific Northwest Research Station. Federal Technical Report PNW-GTR-476, Handbook to Strategy 1 Fungal Taxa from the Northwest Forest Plan, October 1999. There were no detections of this species recorded during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia oregonensis* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

42. *Phaeocollybia piceae* A. H. Smith & Trappe

Family: Cortinariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: In humus, litter and soil, associated with roots of Pacific silver fir, Douglas fir and western hemlock. Fruits October and November.
In Oregon and Washington: occurs primarily in Western Hemlock (51%), Tan Oak (18%), Sitka Spruce (12%) and Douglas Fir (12%) series at elevations of 0-3288 (1338) feet. Associated species include true firs, sugar pine, Sitka spruce, western hemlock, mountain hemlock, Pacific madrone, Port Orford cedar, tan oak, canyon live oak and California laurel. Other woody associates include *Acer circinatum, Chimaphila umbellata, Berberis nervosa, Gaultheria shallon, Rhododendron macrophyllum, Vaccinium ovatum* and *Vaccinium parvifolium*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula; OR Coast Range, Western Cascades and Klamath; CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia piceae* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

43. *Phaeocollybia pseudofestiva* A.H. Smith

Family Cortinariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Scattered to caespitose, in humus or soil associated with species of Pinaceae, mixed conifers and hardwoods. Fruits October-January and April-July.
In Oregon and Washington: occurs primarily in the Western Hemlock series (63%) at elevations of 35-3682 (1420) feet. Associated species include western hemlock, Sitka spruce, western red cedar, Noble fir, Douglas fir, pines, oaks and bigleaf maple. Other woody associates include *Acer circinatum, Berberis nervosa, Gaultheria shallon, Holodiscus discolor, Rhododendron macrophyllum* and *Vaccinium parvifolium*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Lowlands; OR Coast Range, Western Cascades and Klamath; CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species**,** *Phaeocollybia pseudofestiva* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

44. *Phaeocollybia scatesiae* A. H. Smith & Trappe

Family: Cortinariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs in litter, associated with roots of Pacific silver fir, Douglas fir and western hemlock. Fruits March, May, October and November.
In Oregon and Washington: occurs primarily in Western Hemlock (67%) and Pacific Silver Fir (17%) series at elevations of 626-4529 (2269) feet. Other woody associates include *Rhododendron macrophyllum* and *Vaccinium* species.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula; OR Coast Range, Western Cascades and Klamath; CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia scatesiae* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

45. *Phaeocollybia sipei* A. H. Smith

Family: Cortinariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs in humus, litter or soil, associated with roots of western hemlock, Douglas fir, red fir and Pacific silver fir. Fruits October-November.
In Oregon: occurs primarily in Western Hemlock (68%) and Tan Oak (21%) series at elevations of 354-3551 (1243) feet. Associated species include western hemlock, Douglas fir, western red cedar, Port Orford cedar, Pacific yew, incense cedar, bigleaf maple, tan oak and California laurel. Other woody associates include *Acer circinatum, Berberis, nervosa, Gaultheria shallon, Holodiscus discolor, Rhododendron macrophyllum, Vaccinium ovatum* and *Vaccinium parvifolium*.
B. Range: A portion of the Northwest Forest Plan area in Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): OR Coast Range, Western Cascades and Klamath; CA Coast Range. There was 1 detection of this species during Random Grid CVS/FIA plot surveys: Siuslaw NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia sipei* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

46. *Phaeocollybia spadicea* A.H. Smith

Family: Cortinariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Solitary, scattered or gregarious in humus, litter or soil, under mixed coniferous forests or forests associated with *Abies, Picea, Pseudotsuga,* and *Tsuga.* Fruits September- December.
In Oregon and Washington: occurs primarily in Western Hemlock (74%) and Sitka Spruce (16%) series at elevations of 10-3157 (1473) feet. Associated species include Pacific silver fir, incense cedar, Sitka spruce, Douglas fir, western red cedar, western hemlock, bigleaf maple and red alder. Other woody associates include *Acer circinatum, Berberis nervosa, Gaultheria shallon, Rhododendron macrophyllum, Rubus spectabilis, Vaccinium membranaceum* and *Vaccinium ovatum*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula; OR all NWFP provinces except Eastern Cascades; CA Coast Range. There were 3 detections of this species during Random Grid CVS/FIA plot surveys: Siuslaw NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Phaeocollybia spadicea* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka CA.

47. *Polyzellus multiplex* (Underwood) Murrill

Family: Thelephoraceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Chanterelle

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: *Polyzellus multiplex* is associated with roots of *Abies* spp.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades and Eastern Cascades; OR all NWFP provinces *except* Coast Range and Willamette Valley; CA Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Polyzellus multiplex* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

48. *Ramaria amyloidea* Marr & Stuntz

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs in humus, litter and soil, associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla*. Fruits September-October.
In Oregon and Washington: occurs primarily in Pacific Silver Fir (46%), White Fir (27%) and Western Hemlock (15%) series at elevations of 1799-5527 (3920) feet. Associated species include Pacific silver fir, white fir, red fir, Shasta red fir, Noble fir, lodgepole pine, western white pine, Douglas fir, western red cedar, western hemlock and mountain hemlock. Other woody associates include *Berberis nervosa, Chimaphila menziesii, Chimaphila umbellata, Rubus lasiococcus, Rubus ursinus, Vaccinium alaskaense, Vaccinium membranaceum* and *Vaccinium scoparium*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades and Eastern Cascades; OR Coast Range, Western Cascades and Eastern Cascades; CA Coast Range and Klamath. There was 1 detection of this species during Random Grid CVS/FIA plot surveys: Mt Hood NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria amyloidea* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

49. *Ramaria araiospora* Marr & Stuntz

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs in humus, litter and soil, associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla*. Fruits October-November.
In Oregon and Washington: occurs primarily in Western Hemlock (82%) and Pacific Silver Fir (7%) series at elevations of 34-5205 (1876) feet. Associated species include western hemlock, Pacific silver fir, white fir, incense cedar, Douglas fir, western red cedar and red alder. Other woody associates include *Acer circinatum, Berberis nervosa, Castanopsis chrysophylla, Gaultheria shallon, Holodiscus discolor, Rhododendron macrophyllum, Rubus spectabilis, Vaccinium membranaceum, Vaccinium ovatum* and *Vaccinium parvifolium*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 101-150 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula, Western Lowlands and Western Cascades; OR Coast Range and Western Cascades; CA Coast Range and Klamath. There were 11 detections of this species during Random Grid CVS/FIA plot surveys: on the Siuslaw, Umpqua, and Willamette NFs in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria araiospora* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka CA.

50. *Ramaria aurantiisiccescens* Marr & Stuntz

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs in humus, litter and soil, associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla*. Fruits in October.
In Oregon and Washington: occurs primarily in Western Hemlock (47%) and Pacific Silver Fir (27%) series at elevations of 561-6934 (3221) feet. Associated species include western hemlock, Pacific silver fir, white fir, subalpine fir, Noble fir, Port Orford cedar, lodgepole pine, ponderosa pine, Engelmann spruce, Douglas fir, western red cedar, mountain hemlock and bigleaf maple. Other woody associates include *Acer circinatum, Arctostaphylos patula, Berberis nervosa, Ceanothus velutinus, Chimaphila umbellata, Cornus canadensis, Gaultheria shallon, Holodiscus discolor, Linnaea borealis, Rhododendron macrophyllum, Rosa gymnocarpa, Rubus ursinus, Vaccinium membranaceum, Vaccinium scoparium* and *Whipplea modesta*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon, and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades and Eastern Cascades; OR Coast Range, Western Cascades and Eastern Cascades; CA Coast Range and Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria aurantiisiccescens* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

51. *Ramaria cyaneigranosa* Marr & Stuntz

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs in humus and litter, associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla*. Fruits in October.
In Oregon and Washington: occurs primarily in Western Hemlock (56%) and Douglas Fir (15%) series at elevations of 251-4173 (1897) feet. Associated species include western hemlock, Douglas fir, Pacific yew, true fir species and red alder. Other woody associates include *Berberis nervosa* and *Gaultheria shallon*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Cascades; OR all NWFP provinces except Eastern Cascades; CA Coast Range and Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria cyaneigranosa* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

52. *Ramaria gelatiniaurantia* Marr & Stuntz

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs on litter and soil, associated with Pinaceae spp. Fruits in October.
In Oregon and Washington: occurs primarily in Western Hemlock series (88%) at elevations of 1632-3618 (2409) feet. Associated species include western hemlock, Douglas fir, western red cedar and Sitka spruce. Other woody associates include *Acer circinatum, Berberis nervosa, Gaultheria shallon* and *Rhododendron macrophyllum*.
B. Range: A portion of the Northwest Forest Plan Area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Cascades; OR Coast Range and Western Cascades; CA Coast Range and Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria gelatiniaurantia* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

53. *Ramaria largentii* Marr & Stuntz

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs on soil, litter and humus, is associated with Pinaceae spp. Fruits in October.
In Oregon and Washington: occurs primarily in Western Hemlock (48%), White Fir (19%), Douglas Fir (14%) and Pacific Silver Fir (14%) series at elevations of 1332-5108 (3339) feet. Associated species include western hemlock, white fir, Douglas fir, Pacific silver fir, grand fir, sugar pine, western white pine, incense cedar, Pacific yew, western red cedar and Pacific madrone. Other woody associates include *Castanopsis chrysophylla, Rhododendron macrophyllum, Rubus* sp. and *Vaccinium* sp.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA Eastern Cascades and Western Cascades; OR all NWFP provinces except Willamette Valley; CA Coast Range and Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria largentii* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

54. *Ramaria rubrievanescens* Marr & Stuntz

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occur on soil, litter and humus, associated with Pinaceae spp. Fruits in late spring and autumn.
In Oregon and Washington: occurs primarily in Mountain Hemlock (25%), White Fir (22%), Western Hemlock (17%) and Pacific Silver Fir (15%) series at elevations of 724-7126 (4093) feet. Associated species include Pacific silver fir, white fir, grand fir, subalpine fir, red fir, Shasta red fir, Noble fir, incense cedar, knobcone pine, lodgepole pine, sugar pine, western white pine, ponderosa pine, Engelmann spruce, Douglas fir, western red cedar, western hemlock, mountain hemlock, bigleaf maple, Pacific madrone, hazelnut, Pacific dogwood, canyon live oak, California black oak and western mountain ash. Other woody associates include *Acer circinatum, Arctostaphylos nevadensis, Berberis nervosa, Chimaphila umbellata, Gaultheria shallon, Holodiscus discolor, Linnaea borealis, Menziesia ferruginea, Rhododendron macrophyllum, Rubus parviflorus, Symphoricarpos mollis, Vaccinium membranaceum, Vaccinium parvifolium* and *Vaccinium scoparium*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades and Eastern Cascades; OR all NWFP provinces except Willamette Valley; CA all NWFP provinces. There were 3 detections of this species during Random Grid CVS/FIA plot surveys: Deschutes, Mt Hood and Willamette NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria rubrievanescens* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

55. *Ramaria rubripermanens* Marr & Stuntz

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs on soil, litter, humus and charred wood, associated with Pinaceae spp. Fruits in June and October.
In Oregon and Washington: occurs principally in Douglas Fir (25%), Western Hemlock (18%), White Fir (18%), Tan Oak (12%) and Pacific Silver Fir (10%) series at elevations of 918-6474 (2897) feet. Associated species include Pacific silver fir, white fir, grand fir, subalpine fir, red fir, Noble fir, incense cedar, lodgepole pine, sugar pine, western white pine, ponderosa pine, Douglas fir, Pacific yew, western red cedar, western hemlock, mountain hemlock, Pacific madrone, hazelnut, tan oak, canyon live oak, California black oak, huckleberry oak and mountain ash. Other woody associates include *Acer circinatum, Arctostaphylos glandulosa, Berberis aquifolium, Berberis nervosa, Castanopsis chrysophylla, Ceanothus integerminus, Chimaphila umbellata, Gaultheria shallon, Holodiscus discolor, Linnaea borealis, Lonicera hispidula, Oplopanax horridum, Rhododendron albiflorum, Rhododendron macrophyllum, Rhus diversiloba, Rosa gymnocarpa, Rubus pedatus, Rubus ursinus, Symphoricarpos mollis, Vaccinium alaskaense, Vaccinium membranaceum, Vaccinium ovalifolium, Vaccinium parvifolium, Vaccinium scoparium* and *Whipplea modesta*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 151-200 known sites
D. Distribution (Physiographic Provinces): WA Olympic Peninsula, Western Cascades and Eastern Cascades; OR all NWFP provinces except Willamette Valley; CA Coast Range and Klamath. There were 10 detections of this species during Random Grid CVS/FIA plot surveys: Mt. Baker-Snoqualmie NF in WA, and Deschutes, Mt Hood, Umpqua and Willamette NFs in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria rubripermanens* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

56. *Ramaria spinulosa* var. *diminutiva* Petersen

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with Pinaceae spp. Fruits in October-November. In Oregon: sole Oregon site occurs in Douglas Fir series at an elevation of 1470 feet.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon, and California.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula; OR Klamath; CA Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria spinulosa* var. *diminutiva* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

57. *Ramaria stuntzii* Marr

Family: Ramariaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Coral

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat associations: Occurs on soil, litter and humus, associated with Pinaceae spp. Fruits October-November.
In Oregon and Washington: occurs primarily in Western Hemlock (66%) and Pacific Silver Fir (12%) series at elevations of 158-5473 (2379) feet. Associated species include Pacific silver fir, white fir, grand fir, Shasta red fir, incense ceday, sugar pine, Douglas fir, Pacific yew, western red cedar, western hemlock, Pacific madrone and tan oak. Other woody associates include *Acer circinatum, Berberis nervosa, Castanopsis chrysophylla, Gaultheria shallon, Rhododendron macrophyllum, Rubus ursinus, Vaccinium membranaceum, Vaccinium ovalifolium* and *Vaccinium parvifolium*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 101-150 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula, Western Cascades and Western Lowlands; OR Coast Range, Western Cascades and Klamath ; CA Coast Range and Klamath. There was 1 detection of this species during Random Grid CVS/FIA plot surveys: Siskiyou NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Ramaria stuntzii* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Exeter, Ronald L.; Norvell, Lorelei.; Cazares, Efren. 2006. Ramaria of the Pacific Northwestern United States. ISDI BLM/OR/WA/PT-06/050-1792, Salem, Oregon 157 p.

58. *Rhizopogon chamaleontinus* A.H. Smith

Family: Rhizopogonaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate/Truffle

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs in association with the roots of Douglas fir and sugar pine at elevations of 3,500 feet. Fruits June & September.
B. Range: A portion of the Northwest Forest Plan area in Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): OR Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Rhizopogon chamaleontinus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

59. *Rhizopogon ellipsosporus* Trappe, Cast. & Amaranthus

Family: Rhizopogonaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate/Truffle

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: In Oregon, occurs in soil in Douglas Fir (57%), Tan Oak (29%) and Mountain Hemlock (14%) series at elevations of 1082-4039 feet. Associated species include western hemlock and *Acer circinatum*. Fruits in October.
B. Range: A portion of the Northwest Forest Plan area in Oregon. In California, known from outside the NWFP area in the Sierra Nevada.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): OR Klamath and Western Cascades. There was 1 detection of this species during Random Grid CVS/FIA plot surveys: Mt Hood NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Rhizopogon ellipsosporus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

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60. *Rhizopogon exiguus* Zeller

Family: Rhizopogonaceae
Ecological function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate/Truffle

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with roots of Douglas fir and western hemlock in Western Hemlock (80%) and Douglas Fir (20%) series at elevations of 85-3979 (2295) feet. Fruits spring and autumn.
B. Range: A portion of the Northwest Forest Plan area in Washington and Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades and Eastern Cascades; OR Coast Range and Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Rhizopogon exiguus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

61. *Sarcodon fuscoindicus* (K. Harr.) K. Harrison

Family Hydnaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Toothed fungus

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs scattered to gregarious on soil, litter and humus. Fruits autumn and winter.
In Oregon and Washington: occurs primarily in Western Hemlock (43%) and Pacific Silver Fir (20%) series at elevations of 34-6516 (2558) feet. Associated species include Pacific silver fir, sugar pine, Douglas fir, western red cedar, western hemlock and tan oak. Other woody associates include *Acer circinatum, Berberis nervosa, Gaultheria shallon, Holodiscus discolor, Rhododendron sp., Vaccinium membranaceum, Vaccinium ovatum* and *Vaccinium parvifolium*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): WA all NWFP provinces; OR all NWFP provinces except Willamette Valley; CA Coast Range and Klamath. There were 6 detections of this species during Random Grid CVS/FIA plot surveys: Gifford Pinchot NF in WA, and Mt Hood NF in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Sarcodon fuscoindicus* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

62. *Sowerbyella rhenana* (Fuchel) J. Moravec

Family: Otidiaceae
Ecological Function: Litter saprobe

I. SPECIES DESCRIPTION

Morphological Habit
Cup fungi

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Occurs in scattered to gregarious or caespitose groups in litter, humus or soil in older, relatively undisturbed conifer communities. Fruits October-December.
In Oregon and Washington: occurs primarily in Western Hemlock (81%) and Douglas Fir (11%) series at elevations of 588-3574 (2101) feet. Associated species include incense cedar, sugar pine, ponderosa pine, Douglas fir, western hemlock, bigleaf maple, hazelnut, tan oak, California black oak. Other woody associates include *Acer circinatum, Arctostaphylos sp., Berberis nervosa, Gaultheria shallon, Holodiscus discolor, Lonicera hispidula, Rhamnus purshiana, Rhus diversiloba, Rubus ursinus, Vaccinium parvifolium* and *Whipplea modesta*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): WA Olympic Peninsula and Western Cascades; OR Coast Range, Western Cascades and Klamath; CA Coast Range and Klamath. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a litter saprobe, *Sowerbyellq rhenana* may be associated with forest litter, duff or debris. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

63. *Sparassis crispa* Wulfen:Fries

Family Sparassidaceae
Ecological Function: Wood saprobe

I. SPECIES DESCRIPTION

Morphological Habit
Cauliflower

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Typically within 2 m of the base of a living conifer tree (*Pseudotsuga*, *Pinus*). Fruits in autumn.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California
C. Relative Abundance: Within Northwest Forest Plan area, 51-100 known sites.
D. Distribution (Physiographic Provinces): WA all NWFP provinces *except* Eastern Cascades; OR all NWFP provinces *except* Willamette Valley and Eastern Cascades; CA Coast Range and Klamath. There was 1 detection of this species during Random Grid CVS/FIA plot surveys: Coos Bay BLM in OR.

III. OTHER MANAGEMENT CONSIDERATIONS

As a wood saprobe, *Sparassis crispa* individuals probably do not extend beyond the available substrate (log, stump etc). Retention of habitat patches across a landscape could provide possible areas of refugia and potential areas for colonization. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Breitenbach, J.; Kränzlin, F. 1986. Fungi of Switzerland. Lucerne, Switzerland: Mycological Society of Lucerne. 412 p. Vol. 2.
Miller, O. K. Jr. 1972. Mushrooms of North America. E. P. Dutton & Co., New York. 360 p.

64. *Spathularia flavida* Persoon

Family: Geoglossaceae
Ecological Function: Litter saprobe

I. SPECIES DESCRIPTION:

Morphological Habit
Club fungi

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: In clusters or fairy rings on litter, woody debris and soil, in conifer and hardwood forests. Fruits summer and autumn.
In Oregon and Washington: occurs primarily in Western Hemlock (40%), Douglas Fir (12%), Pacific Silver Fir (12%) and White Fir (10%) series at elevations of 33-5478 (2645) feet. Associated species include white fir, grand fir, lodgepole pine, western white pine, ponderosa pine, Douglas fir, western red cedar, western hemlock, Pacific madrone, tan oak and canyon live oak. Other woody associates include *Acer circinatum, Berberis aquifolium, Berberis nervosa, Castanopsis chrysophylla, Gaultheria shallon, Holodiscus discolor, Linnaea borealis, Rhododendron macrophyllum, Rubus ursinus, Symphoricarpos albus* and *Whipplea modesta*.
B. Range: A portion of the Northwest Forest Plan area in Washington, Oregon and California.
C. Relative Abundance: Within Northwest Forest Plan area, 10-50 known sites.
D. Distribution (Physiographic Provinces): All NWFP provinces *except* CA Cascades. There were 9 detections of this species during Random Grid CVS/FIA plot surveys: Gifford Pinchot NF in WA, Mt Hood, Siskiyou and Willamette NFs in OR, and Six Rivers and Shasta Trinity NFs in CA.

III. OTHER MANAGEMENT CONSIDERATIONS

As a litter saprobe, *Spathularia flavida* may be associated with forest litter, duff or debris. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.

65. *Thaxterogaster pavelekii* Trappe, Cast. & Rawlinson

Family: Cortinariaceae
Ecological Function: Mycorrhizal

I. SPECIES DESCRIPTION

Morphological Habit
Sequestrate/Truffle

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: Associated with roots of Sitka spruce and lodgepole pine in Sitka Spruce (63%) and Western Hemlock (37%) series at elevations of 17-588 (300) feet. Other woody associates *include Arctostaphylos uva-ursi, Gaultheria shallon, Rhododendron* sp., *Salix hookeriana* and *Vaccinium* sp. Fruits March-June.
B. Range: A portion of the Northwest Forest Plan area in Oregon.
C. Relative Abundance: Within Northwest Forest Plan area, less than 10 known sites.
D. Distribution (Physiographic Provinces): OR Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a mycorrhizal species, *Thaxterogaster pavelekii* forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

66. *Tricholomopsis fulvescens* A.H. Smith

Family: Tricholomataceae
Ecological Function: Wood saprobe

I. SPECIES DESCRIPTION

Morphological Habit
Mushroom

A. Description and Distinguishing Features: For details see

- Castellano, M.A. & T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0.
- Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the NWFP. PNW-GTR-476.
- Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the NWFP. PNW-GTR-572.

II. ECOLOGICAL RELATIONSHIPS

A. Habitat Associations: *Tricholomopsis fulvescens* is found solitary on decayed conifer wood above 1000 m elevation.
B. Range: Within the NWFP area known from Washington and California.
C. Relative Abundance: Within NWFP lands: Less than 10 known sites.
D. Distribution (Physiographic Provinces): WA Western Cascades; CA Klamath and Coast Range. There were no detections of this species during Random Grid CVS/FIA plot surveys.

III. OTHER MANAGEMENT CONSIDERATIONS

As a wood saprobe, *Tricholomopsis fulvescens* probably does not extend beyond the available substrate (log, stump etc). Retention of habitat patches across a landscape could provide possible areas of refugia and potential areas for colonization**.** To provide reasonable assurance of continued persistence to occupied sites consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41) with occupied sites wherever possible.

IV. ADDITIONAL REFERENCES

Hoover and Carlberg 2006. Sensitive Fungi Habitat Modeling in Region 5: Synthesis of Known Locations and Survey Results. On file at Six Rivers National Forest, Eureka California.