VIII. Promotion and Tenure Vita

A. Education and Employment Information

1. Education

Ph.D., Oregon State University, 1988. Major: Physical Geography. Minor: Botany. Dissertation work quantified hypogeous sporocarp (truffle) production by ectomycorrhizal fungi in relation to forest structure, community type, successional development, and truffle species phenology.

M.S., Oregon State University, 1987. Major: Physical Geography. Minor: Botany. Thesis addressed synecology of the Monotropoideae (achlorophyllous mycotrophic ericads) within Limpy Rock Research Natural Area, Oregon and the progress of scientific thought concerning the nutritional status of this plant group.

B.S., University of Oregon, 1978. Degree in geography, environmental studies curriculum with an emphasis on physical geography and botany.

2. Fields of specialization

The primary focus of my research is to advance the knowledge of ectomycorrhizal fungus species diversity and fruitbody production in managed and unmanaged forests of the Pacific Northwest. In furthering my research, I have pioneered research designs that evaluate production of commercially harvested edible forest mushrooms. I find it particularly rewarding to work at the interface of basic and applied science. This research is at the crossroads of basic biology/ecology, silviculture, and sustainable forestry. Society in the 21st century will expect forest management to be holistic in its objectives and outcomes. One of my goals is to further the process of integrating studies from soil ecosystems into the conservation biology arena.

3. Professional Experience

1997 to present. Assistant Professor, Senior Research, Department of Forest Science, Oregon State University

1989 – 1997. Research Associate, Department of Forest Science, Oregon State University.

1987 – 1988. Research Assistant, Department of Forest Science, Oregon State University. Ecological studies of truffle fungi.

1986 – 1987. Research Assistant, Department of Forest Science, Oregon State University. Research in collaboration with Oregon Garden Products, Inc. on inoculation of ornamental conifer seedlings with ectomycorrhizal fungi.

1984 – 1986. Graduate Research Assistant, Department of Forest Science, Oregon State University. Ecological studies of truffle fungi. Vegetation studies, Mt. St. Helens.

1983 (June-Sept.). Graduate Research Assistant, vegetation studies: H. J. Andrews Experimental Forest, Three Sisters Wilderness, Mt. St. Helens.

1982 (June-Sept.). M.S. thesis research, synecology with special reference to monotropes in Limpy Rock RNA. Also, ground truthing of satellite imagery for NASA project.

1982 (March-June). Instructor, Biogeography 210, Portland State University.

1982 (March). Field work in northern Mexico and southern Arizona with Drs. John Miller and Ed Leuck for their monograph of the genus *Echinocereus*.

1981 (June-Nov.). Graduate Research Assistant, forest vegetation research in Three Sisters Wilderness for a Man and the Biosphere project under the direction of Drs. Jerry Franklin and Richard Waring. Vegetation research at Mt. St. Helens. Vegetation mapping for Three Sisters MAB project.

1981 (Jan.-June). Graduate Teaching Assistant for Climatology, Department of Geography, Oregon State University.

1980 (Sept.-Nov.). Vegetation studies of *Pleuricospora fimbriolata* habitat.

1979 – 1980. Botanical Resources Specialist, Bureau of Land Management. Planning team and field surveys for sensitive plant species.

1978. Neopropagation Inc. Culturing ectomycorrhizal fungi for Dr. Carl Johannessen.

1977-1978. Field research with Dr. John Miller, during his studies of the *Claytonia perfoliata* complex, in California, Nevada, and Oregon.

B. Teaching, Advising, and Other Assignments

1. Instructional Summary

a. Credit Courses Taught.

1. Small Mammal Mycophagy (FS 505), 1-credit hour graduate seminar. I have offered this reading and conference class each winter term since 2000. Enrollment has ranged from 2 to 5 students. The interdependencies among fungi, mycophagists, and forest trees are explored. This web-of-life is a fundamental part of forest ecology in many regions. Partially as an outgrowth of this class, I was lead author of a book chapter that reviewed and summarized current knowledge on the subject (BC3, Luoma et al. 2003).

2. Field Classes – Introductory Forest Mycology and Forest Mycology.
   I designed and offered this course through the Siskiyou Field Institute and Southern Oregon University. This course provides broad overview of forest mycology with emphasis on the ecology and identification of ectomycorrhizal fungi. Issues surrounding commercially harvested edible forest fungi and the important roles of decomposer and pathogenic fungi are also addressed. Offered 1999, 2003, 2004, 2006; non-credit or for 1-2 hrs. of Biology 330 credit at SOU. The course initially spanned 3 days and was expanded to 4 days in 2003 and to 5 days in 2004 with "Forest Mycology" consisting of the last 3 days. By expanding the class, I was better able to meet student interests and expectations. The number of students ranged from 6 - 12.

3. Research Questions in Forest Mycology (FS 599), 1-credit hour graduate course, offered in conjunction with FS 520, Posing Researchable Questions; Fall 2004 for 10 students. The purpose of this class is to expose students to a discipline that they might not otherwise encounter in their programs and to provide them with new perspectives from an overview of classic and current questions in Forest Mycology.

b. Non-credit Courses, Workshops, and Guest Lectures

1. Guest Lecture - "Ectomycorrhizae and Green-tree Retention". Current Research in Forest Science (FS552), Oregon State University, Oct., 2002.

2. Guest Lecture - "Ecological Roles of Forest Fungi". Introduction to Mycology (Bio 365), Linfield College, McMinnville, OR, Nov., 2002.

Extension /Outreach

1. Regional Workshop Series – Mushrooms and Managers.
   Co-organizer and instructor with Dr. James Trappe. Offered through the College of Forestry Conference Office. Subject areas included: Roles of fungi in ecosystems, biology of fungi, mushroom identification, uses of wild fungi, effects of management practices on wild-mushroom and truffle production, monitoring the mushroom resource, laws and regulation governing trade in wild mushrooms. A field trip and hands-on lab were included. Attendance was limited to 25-30. This two-day workshop was conducted at the following locations:

   Roseburg – Nov. 23-24, 1998
   Blue River – April 28-29, 1998
   La Grande – May 2-3, 1996
   Sandy – Nov. 7-8, 1995
   Springfield – April 18-19, 1995
   Jacksonville – Nov. 15-16, 1994
   Cave Junction – Nov. 8-9, 1993
   Chemult – Oct. 21-22, 1992

Rapid and direct communication of my research results to practitioners is an important aspect of my work. Other workshops where I made "technology transfer" presentations include:

2. Balancing Ecosystem Values: Innovative Experiments for Sustainable Forestry. An International Union for Forest Research Organizations workshop co-sponsored by USDA Forest Service, Oregon State University, and the University of Washington. Portland, Oregon. 2004.
3. The Annual Tri-Forest Ecosystem Workshop,. USDA Forest Service, Umpqua, Siskiyou, and Rogue National Forests. Gold Beach, OR. 2004.
4. The Annual Tri-Forest Ecosystem Workshop,. USDA Forest Service, Umpqua, Siskiyou, and Rogue National Forests. Gold Beach, OR. 2002
5. Green-tree Retention Workshop – Interdisciplinary Information for Forest Managers. USDA Forest Service, Pacific Northwest Research Station. Eagle Creek, Oregon. 1999.
6. Conference on the business and science of special forest products. Western Forestry and Conservation Association. Hillsboro, Oregon. 1994

2. Advising

a. Major Professor

1. Christopher Stockdale, Forest Science, MS, graduated 2001.
2. Kathy Jacobs, Forest Science, MS, graduated, 2002.
3. Oralia Kolaczkowski, Forest Science, MS, graduated, 2005.

b. Graduate Committee Membership

1. Ankie Camacho, Botany & Plant Path., Ph.D., finished
2. Charlie LeFevre, Forest Science, Ph.D., finished
3. Betsy St. Pierre, Forest Science, Ph.D., finished
4. Dave Waldien, Fisheries & Wildlife, Ph.D., finished
5. Tim Link, Geology, Ph.D., finished
6. Chris Walsh, Environmental Science, Ph.D., in progress
7. Matt Trappe, Environmental Science, MS, finished, Ph.D., in progress
8. Dan Jones, Environmental Science, MS, finished
9. Janine Rice, Geosciences, Ph.D., in progress
10. Sheila Slevin, Soil Science, Ph.D., in progress

c. Post Docs and Visiting Scientists
   1. Efren Cazares, Research Associate, 1995 to 1999 (served as formal supervisor)
   2. Carolina Barroetavena, Courtesy Research Assistant, 1996 to 1997

3. Mentoring of Undergraduates

a. McNair Scholars Program
   1. Oralia Kolaczkowski, Forest Resources, B.S. 2001.

b. Undergraduate Research, Innovation, Scholarship, and Creativity Program
   1. Dylan Nelson, Microbiology, summer term, 1999.
   2. Aloha Yoshinaga, Science Education, summer term 2002

4. Public Education

a. News Stories
   1. “Walk among Salem's old-growth trees”, Salem Statesman Journal, Nov., 2003. http://news.statesmanjournal.com/article.cfm?i=70403
   2. “Proper Harvest Critical to sustaining Matsutake Industry”, OSU News and Communication Services, July, 2003. http://oregonstate.edu/dept/ncs/newsarch/2003/Jul03/matsutake.htm

b. Radio Interviews
   1. “Wild Mushroom Harvest”, KLCC, Eugene, OR, July, 2003.
   2. “Wild Mushroom Harvest”, Jefferson Public Radio, Ashland, OR, Aug. 2003.

c. Magazine Articles
   1. Taylor, Peter. 2000. “Major Player” National Wildlife, 38(4): 50.

d. Books
   1. Luoma, Jon. 1999. “The Hidden Forest: Biography of an Ecosystem” Henry Holt & Company, pp. 112-113.
   2. Baskin, Yvonne. 2005. “Underground: how creature of much and dirt shape our world” Island Press, p. 133.

e. Television
   1. Suzuki, David. 1988. “The Nature of Things” Canadian Broadcasting Corporation (I presented information about the role of fungi in forest ecology).

2. Bellamy, David. 1989. "Ancient Forests" (I presented information about the role of fungi in forest ecology).
3. Attenborough, David. 1995. "The Private Life of Plants", British Broadcasting Corporation (consultant, filming of *Sarcodes* was done on one of my research plots).

C. Scholarship and Creative Activity

1. Research Accomplishments

a. Advanced knowledge of ectomycorrhizal fungus species diversity and fruitbody production in managed and unmanaged forest stands

Ectomycorrhizae occur on most dominant forest trees in temperate coniferous forests. The vital role of ectomycorrhizal fungi (EMF) in Douglas-fir forest establishment and recovery is well documented and EMF are required for host survival in field soil. Ectomycorrhizal fungi produce, with few exceptions, macroscopic fruitbodies (mushrooms and truffles) that are essential in wildlife food webs in temperate forest ecosystems all over the world. I have been a leader in research to document species diversity and fruitbody production in PNW forests by my development of long-term studies designed to determine effects of forest management on these fungi.

Working with cryptic and weather-dependent soil biota imposes unique challenges on research. For instance, my most recent publications represent the culmination of years of field and laboratory work (1993 - 2003). Such effort is necessary, however, to provide a broad scope of inference in planned, manipulative forest experiments. My published results now support science-based management decisions that use dispersed green-tree retention in combination with aggregated retention. In comparison to clearcutting, such silvicultural prescriptions ameliorate the effects of timber harvest on the biodiversity of life in the soil (RP15, Luoma et al. 2004).

Research advances have been reported in refereed journal publications: 1, 2, 6, 10, 12, 13, 14, 15, 16; book chapters: 1, 2, 3, 4; peer-reviewed publications: 4, 8, 9, 11-15, 17-19, 23, 25, 26; abstracts: 1-4, 6-8, 10-15, 17-19, 21,23; other scientific publication: 2; international/national invited talks: 1, 2, 4-6, 8, 10-17; regional invited talks: 1-3, 5-9; and in the regional workshops series: Mushrooms and Managers.

Knowledge of the response of EMF to forest management treatments in comparison to unmanaged forests and baseline conditions improves the ability of forest managers to maintain a full array of ecosystem functions and, hence, forest productivity. Forest managers are eager to obtain this information. By publishing early results of long-term projects in outlets that target managers, preliminary trends are conveyed quickly. This more direct approach to "technology transfer" is an important step in adaptive management.

b. Pioneered research designs that evaluate production of commercially harvested forest mushrooms

In the last decade supplemental income from mushroom harvesting has grown substantially for thousands of rural workers in the Pacific Northwest. The wild harvest of edible fungi is now a multimillion-dollar industry. The development of this special forest product industry has raised considerable controversy about how this resource should be managed, especially on public lands. Concerns center around destruction of habitat by repeated entry for tree harvest, gradual loss of the mushroom resource by potential over harvest, conflict between recreational users and commercial harvesters, and regulation and monitoring of future harvests. A key to sustainable management is a common understanding among resource managers, the mushroom industry, and the concerned public about the biology and ecology of these forest organisms and the effects of forest disturbance on their survival.

To address some of these concerns, I initiated a study to provide baseline ecological data on one of the most commercially important edible forest fungi in the Pacific Northwest – *Tricholoma magnivelare* or American matsutake. We found that commercial harvest of matsutake took no more than half of the total sporocarp production. This finding addressed management concerns about reduced spore dispersal and diminished availability of a wildlife food. Economic models that incorporated data from my research plots calculated the potential value added per ha under several forest management options. The potential value of the mushroom crop in the study area ranged from $325 to $1,160 per ha. Such work allows managers to broaden their scope of analysis during forest plan development (RP11, Pilz et al. 1999).

I have also taken the lead to address issues raised by the community of matsutake harvesters about potential damage to the resource caused by harvest techniques. I was a co-PI for the initial design and implementation of a study that evaluated the effect of various mushroom harvest techniques on matsutake production. I am now PI for the long-term monitoring portion of the study. The results from the first ten years show that “best management practice” harvest techniques maintain normal levels of mushroom production while other mushroom harvest techniques significantly lower mushroom production. This information has been communicated to managers via an invited presentation (R10) and poster (P16) preliminary to a recently submitted journal paper. These results have allowed managers to develop science-based mushroom harvest regulations that protect the resource while allowing sustainable use.

Results from these studies have been reported in refereed journal publications 11, 17; peer-reviewed publications: 6, 7, 10, 11, 14, 24, 26, 27, 28; abstracts: 9, 16; international invited talks 5, 14; regional talk 10; and in the regional workshops series: Mushrooms and Managers.

These ongoing studies have broad regional significance because the same issues face forest managers from southeast Alaska through British Columbia and into northern California. Long-term results will provide information on the abundance and distribution of commercially harvested mushrooms that is necessary to assess the effects of forest management and mushroom harvest impacts on ecosystem processes and local economies.

c. Contributed to new descriptions of ectomycorrhizae *in vivo* and *in vitro*

Characterization of ectomycorrhizae has a long history dating from the late 1800's. Such characterizations are crucial to the study of EMF in ecosystems and EMF response to forest management (as noted above). Assessment of the impacts of disturbance on forest ecosystems and conservation of species diversity depend on fundamental efforts to make identifications of EMF available. I am a co-author on eight of these new descriptions.

Accomplishments have been reported in refereed journal publications: 3, 5, 8, 9; and peer-reviewed publications: 16, 20-22. To communicate with researchers in ways not possible in printed journals, my database of over 200 EMF descriptions and photographic atlas was demonstrated at the 2002 meeting of the Mycological Society of America. The data base also includes relational structure to store the molecular data (DNA fingerprinting) associated with mycorrhizae. Subsequently I provided interested colleagues with the entire database structure for use in their research. My leadership in this area of research is further demonstrated by being selected as one of the editors of the new journal "Descriptions of Ectomycorrhizae."

My efforts foster scientists ability to understand the community structure of underground ecosystems across a range of scales from individual trees and forest stands to landscape segments. It has been noted that in order for science to advance, the fundamental elements of any branch must be ordered and classified. My work in this field is significant due to a paucity of existing information. By contributing new information to a discipline that is at an early stage of development, I am helping lay the foundation for future advancements. Natural Resources Canada is very interested in this work and descriptions may be viewed at the British Columbia Ectomycorrhizal Research Network web site
http://www.pfc.cfs.nrcan.gc.ca/biodiversity/bcern/intro_e.html
In particular http://www.pfc.cfs.nrcan.gc.ca/biodiversity/bcern/description/description-cde9_e.html and
http://www.pfc.cfs.nrcan.gc.ca/biodiversity/bcern/description/description-cde15_e.html

d. Documented effects of chloropicrin fumigation on vascular plants

Treatment of stumps with chloropicrin has been shown to dramatically reduce the amount of laminated root rot inoculum on a forest site and chloropicrin has been labeled by the U. S. Environmental Protection Agency for this use. Potentially widespread general use of this chemical necessitates knowledge as to its effects on organisms other than those targeted. Chloropicrin is a general biocide that has been used as a soil fumigant and studied for its effectiveness in reducing specific pests; however, information on effects on nontarget organisms is scanty.

My work was the first to investigate chloropicrin effects on vascular plants. Research results were reported in refereed journal publications 4, 7; and peer-reviewed publication 5.

It was demonstrated that chloropicrin treatment may impact nontarget organisms and that if potential impacts on non-target vegetation are to be considered, great caution is warranted before introducing chloropicrin into an ecosystem (RP7, Luoma et al. 1997). This information is important to forest ecologists, mycologists, and land managers in our region and beyond.

e. Tested the hypothesis that availability of mycorrhizal propagules is equally critical with other factors in determining patterns of plant community development on new substrates.

Alpine zones provide naturally stressed and disturbed settings to test the hypothesis that vesicular-arbuscular mycorrhiza dependent vascular plants are not early colonizers of glacier forefront habitats. Studies of the mycorrhizal status of alpine plants from the North Cascade Mountains and Niwot Ridge/Green Lakes Long Term Ecological Research Site confirmed that mechanisms of fungal dissemination and interactions with host mycorrhizal dependence are consistent with early patterns of plant colonization by non-mycorrhiza dependent species (BC2, Trappe & Luoma, 1992). This work laid the foundation for subsequent studies by Jumpponen, Trappe, and Cazares.

These findings have been reported in book chapter 2; abstract 1; international/national invited talk 5; regional invited talk 3, and in the regional workshops series: Mushrooms and Managers.

f. Gathered the first comprehensive information on the synecology of the Monotropoidae and extended the known range of *Sarcodes sanguinea*

The Monotropoideae is most commonly considered a sub-family of the Ericaceae (heath family). This group of plants has no chlorophyll and is dependent upon specialized mycorrhizal relationships for nutrition and growth. Several species are considered "sensitive" to disturbance and are afforded special management attention. I studied the eight species which occur in western North America at Limpy Rock Research Natural Area; the only place known where all eight co-occur closely. My discovery of the northernmost population of *Sarcodes* lead to an ongoing 22-year effort monitoring and mapping the population.

Results have been presented in book chapter: 2; peer-reviewed publications: 1-3; abstract: 5; other scientific publication 1; international/national invited talks: 3, 7, 9; regional invited talks: 3, 4, 9; and in the regional workshops series: Mushrooms and Managers.

Ecological relationships with moisture and temperature gradients were demonstrated. Should accelerated climatic change increase pressures for northward species migration, the Limpy Rock *Sarcodes* population may assume special importance in the long-term survival of the species. This work has regional significance and knowledge gained from the *Sarcodes* monitoring project is now serving as a model for the related species *Allotropa virgata*. *Allotropa* is targeted for special management by Federal

agencies under the Northwest Forest Plan and I am named in the plan as a primary contact for scientific information concerning the management of the species.

2. Refereed Journal Publications:

(17) **Luoma, D.L.**, Eberhart, J.L., Abbott, R., Moore, A., Amaranthus, M.P., and Pilz, D. 2006. Effects of mushroom harvest technique on subsequent American matsutake production. *Forest Ecology and Management*, 236:65–75.

(16) **Luoma, D.L.**, Stockdale, C.A., Molina, R., and Eberhart, J.L. 2006. The spatial influence of Douglas-fir retention trees on ectomycorrhiza diversity. *Canadian Journal of Forest Research*, 36:2561–2573.

(15) **Luoma, D.L.**, Eberhart, J.L., Molina, R., and Amaranthus, M.P. 2004. Response of ectomycorrhizal fungus sporocarp production to varying levels and patterns of green-tree retention. *Forest Ecology and Management*, 202:337–354.

(14) Kretzer, A.M., **Luoma, D.L.**, Molina, R., and Spatafora, J. 2003. Taxonomy of the *Rhizopogon vinicolor* species complex based on analysis of ITS sequences and microsatellite loci *Mycologia*, 95:480–487.

(13) Manning, T., Maguire, C.C., Jacobs, K.M., and **Luoma, D.L.** 2003. Additional habitat, diet and range information for the white-footed vole (*Arborimus albipes*). *American Midland Naturalist*, 150:115–122.

(12) Smith, J.E., Molina, R., Huso, M.M.P., **Luoma, D.L.,** McKay, D., Castellano, M.A., Lebel, T., and Valachovic, Y. 2002. Species richness, abundance, and composition of hypogeous and epigeous ectomycorrhizal fungal sporocarps in young, rotation-age, and old-growth stands of Douglas-fir (*Pseudotsuga menziesii*) in the Cascade Range of Oregon, U.S.A. *Canadian Journal of Botany*, 80:186–204.

(11) Pilz, D., Smith, J., Amaranthus M.P., Alexander, S., Molina, R., and **Luoma D.L.** 1999. Mushrooms and timber: Managing commercial harvesting in the Oregon Cascades. *Journal of Forestry*, 97:4-11.

(10) Cazares, E., **Luoma, D.L.**, Amaranthus, M.P., Chambers, C.L., and Lehmkuhl, J.F. 1999. Interaction of fungal sporocarp production with small mammal abundance and diet in Douglas-fir stands of the Southern Cascade Range. *Northwest Science*, 73:64–76.

(9) Barroetavena, C., Gisler, S.D., **Luoma, D.L.**, and Meinke, R.J. 1998. Mycorrhizal status of the endangered species *Astragalus applegatei* Peck as determined from a soil bioassay. *Mycorrhiza*, 8:117–119.

(8) Massicotte, H.B., Melville, L.H., Peterson, R.L., and **Luoma, D.L.** 1998. Anatomical aspects of field ectomycorrhizas on *Polygonum viviparum* (Polygonaceae) and *Kobresia bellardii* (Cyperaceae). *Mycorrhiza*, 7:287–292.

(7) **Luoma, D.L.**, and Thies, W.G. 1997. Stumps fumigated with chloropicrin: effects on surrounding plants. *Canadian Journal of Forest Research*, 27:1737–1745.

(6) Waters, J.R., McKelvey, K.S., **Luoma, D.L.**, and Zabel, C.J. 1997. Truffle production in old-growth and mature fir stands in northeastern California. *Forest Ecology and Management*, 96:155–166.

(5) Agerer, R., Danielson, R.M., Egli, S. Ingleby, K., **Luoma, D.**, and Treu, R. (Eds.) 1996. *Descriptions of Ectomycorrhizae* 1:1-22.

(4) **Luoma, D.L.**, and Thies, W.G. 1994. Effects of live tree fumigation on nontarget vegetation. *Canadian Journal of Forest Research*, 24:2384-2389.

(3) Massicotte, H.B., Molina, R.J., **Luoma, D.L.**, and Smith, J.E. 1994. Biology of the ectomycorrhizal genus, *Rhizopogon*. II. Patterns of host-fungus specificity following spore inoculation of diverse hosts grown in monoculture and dual culture. *New Phytologist*, 126:677–690.

(2) O'Dell, T.E., **Luoma, D.L.,** and Molina, R.J. 1992. Ectomycorrhizal fungal communities in young, managed, and old-growth Douglas-fir stands. *Northwest Environmental Journal*, 8:166–168.

(1) **Luoma, D.L.,** Frenkel, R.E., and Trappe, J.M. 1991. Fruiting of hypogeous fungi in Oregon Douglas–fir forests: seasonal and habitat variation. *Mycologia*, 83:335–353.

3. Book Chapters and Books

(5) Jacobs, K., Castellano, M.A., **Luoma, D.L.,** Cazares, E., Trappe, J.M. and Eberhart, J.L. 200x. Genera of sequestrate sporocarps of north temperate forests with special reference to animal mycophagy. USDA Forest Service Gen. Tech. Rep. PNW–GTR–xxx. Pac. Northwest Res. Stn., Portland, OR. (accepted, in ed.)

(4) Castellano, M.A., Trappe, J.M., and **Luoma, D.L.** 2004. Chapter 10. Sequestrate fungi. Pp. 197-213. *In*: Mueller, B.M., Bills, G.F., and Foster, M.S., eds. Biodiversity of fungi: Inventory and monitoring methods. Elsevier Academic Press, London. 777 p.

(3) **Luoma, D.L.**, Trappe, J.M., Claridge, A.W., Jacobs, K.M., and Cazares, E. 2003. Chapter 10. Relationships among fungi and small mammals in forested ecosystems. Pp. 343–373. *In:* Zable, C.J. and Anthony, R.G., eds. Mammal community dynamics: Management and conservation in the coniferous forests of western North America. Cambridge University Press, Cambridge, UK. 709 p.

(2) Trappe, J.M. and **Luoma, D.L.** 1992. Chapter 2. The ties that bind: fungi in ecosystems. Pp. 17-27. *In:* Carroll, G. C. and Wicklow, D. T., eds. The fungal community: its organization and role in the ecosystem. Second edition. Marcel Dekker, Inc., New York, 976 p.

(1) **Luoma, D.L.** 1991. Annual changes in seasonal production of hypogeous sporocarps in Oregon Douglas–fir forests. Pp. 83–89. *In:* Wildlife and vegetation of unmanaged Douglas-fir forests. Tech. coords., L. F. Ruggiero, K. B. Aubry, A. B. Carey, and M. H. Huff. USDA Forest Service Gen. Tech. Rep. PNW–GTR–285. Pac. Northwest Res. Stn., Portland, OR. 533 p.

4. Peer-reviewed Scientific Publications (Non-journal)

(29) **Luoma, D.L.** and Eberhart, J.L. 2005. Results from green-tree retention experiments: ectomycorrhizal fungi. *In*: Peterson, C.E. and Maguire, D.A. (eds.). Balancing ecosystem values: innovative experiments for sustainable forestry. Proceedings of a conference. Gen. Tech. Rep. PNW-GTR-635. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. Pp. 257–264.

(28) Pilz,D., Molina, R., Danell, E., Waring, R., Rose, C., Alexander, S., **Luoma, D.L.,** Cromack Jr., K., and Lefevre, C. 2003. SilviShrooms: Predicting edible ectomycorrhizal mushroom productivity. *In*: Johnson, A.C., Haynes, R.W., and Monserud, R.A. (eds.) Congruent management of multiple resources: proceedings from the Wood Compatibility Initiative workshop. USDA Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. PNW-GTR-563. Portland, OR. Pp. 199–207

(27) Pilz,D., Molina, R., Danell, E., Waring, R., Rose, C., Alexander, S., **Luoma, D.L.,** Cromack Jr., K., and Lefevre, C. 2002. SilviShrooms: Predicting edible mushroom productivity using forest carbon allocation modelling and immunoassays of ectomycorrhizae. *In*: Hall, I.R., Wang, Y., Zambonelli, A., and Danell, E. (eds). Edible mycorrhizal mushrooms and their cultivation. Proceedings of the second international conference on edible mycorrhizal mushrooms. New Zealand Institute for Crop & Food Research Limited, Christchurch. Pp. 1-10.

(26) **Luoma, D.L.**, Molina, R., Pilz, D., and Lefevre, C. 2001. Use of molecular techniques in the investigation of forest mushroom production under different ecosystem management options. *In:* Challenges of Agricultural Science for the 21st Century. Proceedings of the International Symposium for the 50th Anniversary of the College of Agriculture, Chungbuk National University, Chungbuk, Korea. Pp. 59–69.

(25) Amaranthus, M.P., **Luoma, D.L.**, Eberhart, J.L., and Trappe, J.M. 2001. Truffle dominance and diversity in natural vegetative communities. *In:* Science and Culture of the Truffle – Proceedings of the 5th International Congress. French Federation of Truffle Growers, Aix-en-Provence, France. Part 4, Pp. 183–187.

(24) Amaranthus, M.P., Pilz, D., Moore, A., Abbott, R., and **Luoma, D.L.** 2000. American Matsutake (*Tricholoma magnivelare*) across spatial and temporal scales. *In*: Powers, R.F., Hauxwell, D.L., and Nakamura, G.M. (eds.) Soil Biology and Forest Management. Proceedings, California Forest Soils Council Symposium

February 23-24, 1996, Sacramento, California. USDA Forest Service PSW Res. Sta., Gen. Tech. Rep. PSW-178. Albany, Calif. Pp. 99–108.

(23) Waters, J.R., McKelvey, K.S., Zabel, C.J., and **Luoma, D.L.** 2000. Northern flying squirrel mycophagy and truffle production in fir forests in northeastern California. *In*: Powers, R.F., Hauxwell, D.L., and Nakamura, G.M. (eds.) Soil Biology and Forest Management. Proceedings, California Forest Soils Council Symposium February 23-24, 1996, Sacramento, California. USDA Forest Service PSW Res. Sta., Gen. Tech. Rep. PSW-178. Albany, Calif. Pp. 73–97.

(22) Eberhart, J.L., and **Luoma, D.L.** 2000. *Russula densifolia* + *Pseudotsuga menziesii*. *In*: Goodman, D.M., Durall, D.M., Trofymow, J.A., and Berch, S.M. (eds.). A manual of concise descriptions of North American ectomycorrhizae. Mycologue Publications, co-published by B.C. Ministry of Forests, Canadian Forest Service, Victoria B.C. Pp. CDE27.1-4.

(21) Trappe, M., Eberhart, J.L., and **Luoma, D.L.** 2000. *Craterellus tubaeformis* + *Tsuga heterophylla*. *In*: Goodman, D.M., Durall, D.M., Trofymow, J.A., and Berch, S.M. (eds.). A manual of concise descriptions of North American ectomycorrhizae. Mycologue Publications, co-published by B.C. Ministry of Forests, Canadian Forest Service, Victoria B.C. Pp. CDE28.1-4.

(20) Eberhart, J.L., and **Luoma, D.L.** 1997. *Lactarius rubrilacteus* + *Pseudotsuga menziesii*. *In*: Goodman, D.M., Durall, D.M., Trofymow, J.A., and Berch, S.M. (eds.). A manual of concise descriptions of North American ectomycorrhizae. Mycologue Publications, co-published by B.C. Ministry of Forests, Canadian Forest Service, Victoria B.C. Pp. CDE15.1-4.

(19) Amaranthus, M.P. and **Luoma, D.L.** 1997**.** Diversity of ectomycorrhizal fungi in forest ecosystems: importance and conservation. In: Martins *et al.* (eds.). Progress in microbial ecology. Proceedings -7th International Symposium on Microbiology-Santos, Brazil, 1995. Pp. 99–105.

(18) Kaye, T., Liston, A., Love, R., **Luoma, D.**, Meinke, R.J., and Wilson, M. (eds.). 1997. Conservation and management of native plants and fungi. Native Plant Society of Oregon, Corvallis, Oregon. 296 p.

(17) **Luoma, D.L.**, Eberhart, J.L., and Amaranthus, M.P. 1997. Biodiversity of ectomycorrhizal types from Southwest Oregon. *In*: Kaye, T.N., Liston, A., Love, R.M., Luoma, D.L., Meinke, R.J., and Wilson, M.V. (eds.). Conservation and management of native plants and fungi. Native Plant Society of Oregon, Corvallis, Oregon. Pp. 249-253.

(16) Eberhart, J.L., and **Luoma, D.L.** 1996. *Truncocolumella citrina* + *Pseudotsuga menziesii*. *In*: Goodman, D.M., Durall, D.M., Trofymow, J.A., and Berch, S.M. (eds.). A manual of concise descriptions of North American ectomycorrhizae. Mycologue Publications, co-published by B.C. Ministry of Forests, Canadian Forest Service, Victoria B.C. Pp. CDE9.1-4.

(15) Eberhart, J.L., **Luoma, D.L.**, and Amaranthus, M.P. 1996. Response of ectomycorrhizal fungi to forest management treatments – A new method for quantifying morphotypes. *In*: Azcon-Aguilar, C. and Barea, J. M. (eds.). Mycorrhizas in integrated systems: from genes to plant development. Luxembourg: Office for Official Publications of the European Communities. Pp. 96–99.

(14) **Luoma, D.L.**, Eberhart, J.L., and Amaranthus, M.P. 1996. Community structure and dynamics of ectomycorrhizal fungi in managed forest stands: Demonstration of ecosystem management options (DEMO) program. *In*: Pilz, D. and Molina, R. (eds.). Managing forest ecosystems to conserve fungus diversity and sustain wild mushroom harvests. USDA Forest Service Gen. Tech. Rep. PNW–GTR–371. Pac. Northwest Res. Stn., Portland, OR. Pp. 27-31.

(13) **Luoma, D.L.,** Eberhart, J.L., and Amaranthus, M.P. 1996. Response of ectomycorrhizal fungi to forest management treatments – Sporocarp production. *In*: Azcon-Aguilar, C. and Barea, J. M. (eds.). Mycorrhizas in integrated systems: from genes to plant development. Luxembourg: Office for Official Publications of the European Communities. Pp. 553–556.

(12) **Luoma, D.L.**, Eberhart, J.L., and Amaranthus, M.P. 1996. Response of ectomycorrhizal fungi to forest management treatments: implications for long-term ecosystem productivity. *In*: Pilz, D. and Molina, R. (eds.). Managing forest ecosystems to conserve fungus diversity and sustain wild mushroom harvests. USDA Forest Service Gen. Tech. Rep. PNW–GTR–371. Pac. Northwest Res. Stn., Portland, OR. Pp. 23-26.

(11) O'Dell, T.E., Smith, J.E., Castellano, M. and **Luoma, D.L.** 1996. Diversity and conservation of forest fungi. *In*: Pilz, D. and Molina, R. (eds.). Managing forest ecosystems to conserve fungus diversity and sustain wild mushroom harvests. USDA Forest Service Gen. Tech. Rep. PNW–GTR–371. Pac. Northwest Res. Stn., Portland, OR. Pp. 5-18.

(10) Pilz, D., Fischer, C., Molina, R., Amaranthus, M., and **Luoma, D.** 1996. Matsutake productivity and ecology plots in southern Oregon. *In*: Pilz, D. and Molina, R. (eds.). Managing forest ecosystems to conserve fungus diversity and sustain wild mushroom harvests. USDA Forest Service Gen. Tech. Rep. PNW–GTR–371. Pac. Northwest Res. Stn., Portland, OR. Pp. 75-77.

(9) Smith, J.E., Molina, R., McKay, D., Castellano, M. and **Luoma, D.** 1996. Measuring fungal succession in Douglas-fir forests. *In*: Pilz, D. and Molina, R. (eds.). Managing forest ecosystems to conserve fungus diversity and sustain wild mushroom harvests. USDA Forest Service Gen. Tech. Rep. PNW–GTR–371. Pac. Northwest Res. Stn., Portland, OR. Pp. 32-35.

(8) Smith, J.E., Molina, R., McKay, D., **Luoma, D.**, and Castellano, M. 1996. Ectomycorrhizal fungus diversity in Douglas-fir forests of the Oregon Cascades. *In:* Azcon-Aguilar, C. and Barea, J. M. (eds.). Mycorrhizas in integrated systems:

from genes to plant development. Luxembourg: Office for Official Publications of the European Communities. Pp. 141-143.

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(6) Molina, R.J., O'Dell, T., **Luoma, D.L.**, Amaranthus, M., Castellano, M., and Russell, K. 1993. The biology, ecology, and social aspects of edible mushrooms in the Pacific Northwest: A preface to managing commercial harvest. Gen. Tech. Rep. PNW-GTR-309. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. 42 p.

(5) Ingham, E.R., W.G. Thies, **D.L. Luoma,** A.R. Moldenke, and M.A. Castellano**.** 1991. Bioresponse of nontarget organisms resulting from the use of chloropicrin to control laminated root rot in a Northwest conifer forest. *In*: M. Marsh (ed.) Pesticides in natural systems: How can their effects be monitored? Proceedings of the conference. U.S. Environmental Protection Agency, Seattle, WA. pp. 81-90.

(4) **Luoma, D. L.** 1988. Biomass and Community Structure of Sporocarps Formed by Hypogeous Ectomycorrhizal Fungi within Selected Forest Habitats of the H. J. Andrews Experimental Forest, Oregon. Ph.D. thesis. Oregon State University, Corvallis. 173 p.

(3) **Luoma, D. L.** 1987. Synecology of the Monotropoideae in a western Oregon coniferous forest habitat. *In* : D. M. Sylvia, L. L. Hung, and J. H. Graham (eds.), Mycorrhizae in the next decade, practical applications and research priorities. Proceedings of the 7th North American conference on mycorrhizae. Institute of Food and Agricultural Sciences, University of Florida, Gainsville, Florida. p. 334.

(2) **Luoma, D. L.** 1987. Synecology of the Monotropoideae within Limpy Rock Research Natural Area, Umpqua National Forest, Oregon M.S. thesis, Oregon State University, Corvallis. 99p.

(1) **Luoma, D. L.** 1982. A description of a plant community supporting abundant *Pleuricospora fimbriolata*. Proceedings of the Oregon Academy of Science, 18:59-71.

5. Poster Abstracts

(26) **Luoma, D.L.**, and Eberhart, J.L. 2005. Forests, fire, and fungi. Joint Annual Meetings of the Mycological Society of America and the Mycological Society of Japan, Hilo, HI. July 30 – Aug. 4.

(25) Eberhart, J.L., **Luoma D.L.**, Abbott, R., and Moore, A. 2005. Ten years of monitoring the effects of harvest techniques on American matsutake (*Tricholoma*

magnivelare) production. Joint Meeting of the Mycological Society of America and the Mycological Society of Japan, Hilo, HI. July 30-Aug. 5.

(24) **Luoma, D.L.**, Eberhart, J.L., and Abbott, R. 2003. Effects of spore inoculum on the ectomycorrhiza diversity of Douglas-fir seedlings. Fourth International Conference on Mycorrhizae, Montreal, Canada. Aug. 10-15.

(23) Eberhart, Joyce L., Yoshinaga, Aloha, and **Luoma, Daniel L.** 2003. Use of RFLP patterns to determine *Cortinarius* species. Fourth International Conference on Mycorrhizae, Montreal, Canada. Aug. 10-15.

(22) Eberhart, J.L., Yoshinaga, A., and **Luoma, D.L.** 2003. Characterization of *Cortinarius* sporocarps using PCR/ RFLP. Annual Meeting of the Mycological Society of America, Pacific Grove, CA. July 27-31.

(21) Eberhart, J.L., and **Luoma, D.L.** 2002. A relational database for RFLP data organization. Annual Meeting of the Mycological Society of America, Corvallis, OR. June 24–27.

(20) McGee, D.N., Eberhart, J.L. and **Luoma, D.L.** 2002. Ectomycorrhizae of Inocybe species. Annual Meeting of the Mycological Society of America, Corvallis, OR. June 24–27.

(19) Smith, J.E., Molina, R., Huso, M., **Luoma, D.L.,** McKay, D., Castellano, M., Lebel, T., and Valachovic, Y. 2002. Community structure of the stalked and stalk-less in aging Douglas-fir forests. Annual Meeting of the Mycological Society of America, Corvallis, OR. June 24–27.

(18) Eberhart, J.L., and **Luoma, D.L.** 2001. Conservation of ectomycorrhizal fungi: Green-tree retention preserves species diversity. Third International Conference on Mycorrhizae. Adeliade, Australia. July 8-13.

(17) Nelson, D., **Luoma, D.L.,** and Cazares, E. 2000. Small mammal mycophagy in the southern Washington Cascade Range. Northwest Scientific Association Annual Meeting. Program & Abstracts. Moscow, Idaho. p. 13.

(16) Eberhart, J.L., **Luoma**, D.L., Pilz, D., Amaranthus, M.P., Abbott, R., and Segotta, D. 1999. Effects of harvest techniques on American Matsutake (*Tricholoma magnivelare*) production. Abstract Book. IXth International Congress of Mycology. Sydney, Australia.

(15) **Luoma, D.L.**, Eberhart, J.L., and Manning, T. 1998. Correlations between small mammal abundance and truffle standing crop in the Cascade Range, USA. Second International Conference on Mycorrhizae. Uppsala, Sweden.

(14) Eberhart, J.L., and **Luoma, D.L.** 1998. Correspondence between ectomycorrhiza abundance and sporocarp biomass on a regional scale. Second International Conference on Mycorrhizae. Uppsala, Sweden.

(13) Cazares, E., **Luoma, D.L.**, Eberhart, J.L., Amaranthus, M.P., Cray, C., Dodd, M.P., and McArthur, M. 1998. Hypogeous fungal diversity and biomass following salvage logging in Mt. Hood National Forest, Oregon, USA. Second International Conference on Mycorrhizae. Uppsala, Sweden.

(12) Cazares, E., **Luoma, D.L.**, Chambers, C.L., and Lehmkuhl, J.F. 1998. Sporocarp biomass, small mammal abundance and diet in two southern Cascade Range forest stands. Northwest Scientific Association Annual Meeting. Olympia, Wash.

(11) Eberhart, J.L., **Luoma, D.L.**, and Amaranthus, M.P. 1996. The link between ectomycorrhizae and sporocarp production. First International Conference on Mycorrhizae. Berkeley, Calif. p. 46.

(10) Eberhart, J.L., **Luoma, D.L.**, and Amaranthus, M.P. 1995. Ectomycorrhiza morphotyping as a tool for assessing biodiversity. Abstracts – Seventh International Symposium on Microbial Ecology. Brazilian Society of Microbiology. São Paulo. p.162.

(9) Fischer, C.R., Molina, R., **Luoma, D.**, and Amaranthus, M. 1993. Productivity and ecological habitat of Matsutake mushroom. *In*: Peterson, L., & Schelkle, M. (eds.). Proc. 9th North American Conference on Mycorrhizae. August 8-12, 1993. Guelph, Ontario, Canada. p. 100.

(8) Ho, I., **Luoma, D.**, and Trappe, J. 1993. Phytohormones of *Rhizopogon*. *In*: Peterson, L., & Schelkle, M. (eds.). Abstracts - 9th North American Conference on Mycorrhizae. August 8-12, 1993. Guelph, Ontario, Canada. p. 45.

(7) **Luoma, D.L.**, Eberhart, J., and Amaranthus, M. 1993. Response of ectomycorrhizal fungi to long-term ecosystem productivity forest management treatments. *In*: Peterson, L., & Schelkle, M. (eds.). Abstracts - 9th North American Conference on Mycorrhizae. August 8-12 , 1993. Guelph, Ontario, Canada. p. 64.

(6) Smith, J.E., Molina, R., **Luoma, D.**, McKay, D., Fischer, C., Eberhart, J., and Castellano, M. 1993. Ectomycorrhizal fungal communities in young, mature, and old-growth Douglas-fir stands in the Oregon Cascades. *In*: Peterson, L., & Schelkle, M. (eds.). Abstracts - 9th North American Conference on Mycorrhizae. August 8-12, 1993. Guelph, Ontario, Canada. p. 67.

(5) **Luoma, D. L.** 1991. Ten years amongst the snow plants. *In*: Mycorrhizas in ecosystems – structure and function. Third European symposium on mycorrhizas. Abstracts. Sheffield, August 19 – 23, 1991.

(4) Castellano, M.A., **Luoma, D.L.**, and Trappe, J.M. 1990. Preliminary summary of the literature on mycorrhiza research. *In*: Allen, M. R., & Williams, S.E. (eds.). Abstracts - 8th North American Conference on Mycorrhizae, Innovation and Hierarchical Integration. Jackson, Wyoming, September 5-8, 1990. University of Wyoming, Laramie. p. 51.

(3) Ho, I., Molina, R., Castellano, M.A., and **Luoma, D.** 1990. Enzyme activity and allozyme patterns in the genus *Rhizopogon*. *In*: Allen, M. R., & Williams, S.E. (eds.). Abstracts - 8th North American Conference on Mycorrhizae, Innovation and Hierarchical Integration. Jackson, Wyoming, September 5-8, 1990. University of Wyoming, Laramie. p. 142.

(2) **Luoma, D.L.**, Frenkel, R.E., and Trappe, J. M. 1990. Fruiting of hypogeous sporocarps in Oregon Douglas-fir forests: Seasonal variation, habitats, and community structure. *In*: Allen, M. R., & Williams, S.E. (eds.). Abstracts - 8th North American Conference on Mycorrhizae, Innovation and Hierarchical Integration. Jackson, Wyoming, September 5-8, 1990. University of Wyoming, Laramie. p. 190.

(1) **Luoma, D.L.,** and Trappe, J.M. 1990. Mycorrhizal ecology of plant colonization of glacier forefronts: Niwot Ridge/Green Lakes LTER site, Colorado. *In*: Allen, M. R., & Williams, S.E. (eds.). Abstracts - 8th North American Conference on Mycorrhizae, Innovation and Hierarchical Integration. Jackson, Wyoming, September 5-8, 1990. University of Wyoming, Laramie. p. 191.

6. Other Scientific Publications

(2) Trappe, J.M., Castellano, M.A., and **Luoma, D.L.** 1992. Diversity of sequestrate fungi in western North America. Newsl. Mycol. Soc. Amer. 43:52.

(1) **Luoma, D. L.** 1988. Field key to the Monotropoideae of California, Oregon, and Washington. Bulletin of the Native Plant Society of Oregon, 21(6):61.

7. Invited and Peer-selected Presentations

a. *International/National:*

(17) 2005. **Keynote**. Conservation and management of ectomycorrhizal fungi. International conference, "Conservation Ecology of Cryptogams - from Theory to Management". Sponsored by the Nordic Research Board (Academy for Advanced Studies), The Royal Swedish Academy of Agriculture and Forestry, and The Swedish Research Council for Environment, Agricultural Sciences, and Spatial Planning. Bispgården, Sweden.

(16) 2004. Results from green-tree retention experiments: ectomycorrhizal fungi. Balancing Ecosystem Values: Innovative Experiments for Sustainable Forestry. An International Union for Forest Research Organizations workshop co-sponsored by USDA Forest Service, Oregon State University, and the University of Washington. Portland, Oregon.

(15) 2002. Conservation of biodiversity: Effects of varying levels of green-tree retention on ectomycorrhizal fungus diversity. Seventh International Mycological Congress, Oslo, Norway.

(14) 2001. Use of molecular techniques in the investigation of forest mushroom production under different ecosystem management options. Presented by Dr. Chang Koo (due to 9/11 concerns). International Symposium for the 50th Anniversary of the College of Agriculture, Chungbuk National University. Chungbuk, Korea.

(13) 2001. Consideration of ectomycorrhizal fungi in sustainable forestry: scaling in ecosystems from root tips to flying squirrels. Third International Conference on Mycorrhizae. Adeliade, Australia.

(12) 2000. Relationships among fungi and small mammals in forested ecosystems. The Wildlife Society, 7th Annual Meeting. Nashville, TN.

(11) 1999. Effects of varying levels and patterns of green-tree retention on truffle biomass production in the Pacific Northwest, USA. IXth International Congress of Mycology. Sydney, Australia.

(10) 1997. Effects of different levels of green-tree retention on ectomycorrhizal fungi. Interdisciplinary Uneven-aged Silviculture Symposium. International Union of Forestry Research Organizations (1.14.00) and College of Forestry, Oregon State University. Corvallis, OR

(9) 1997. Sixteen years amongst the Snow Plants. National Natural Areas Association Annual Meeting. Portland, OR

(8) 1996. Evaluation of ectomycorrhiza biodiversity. Presented by Dr. Steve Miller. International workshop: Importance of mycorrhizal fungi in agricultural and forest ecosystems. Escuela de Ciencians Naturales, Universidad Autónoma de Querétaro, Querétaro, Mexico.

(7) 1996. Fifteen years amongst the Snow Plants. First International Conference on Mycorrhizae. Berkeley, Calif.

(6) 1995. Assessment of ectomycorrhizal fungus diversity on roots and from sporocarps. Seventh International Symposium on Microbial Ecology. Santos, Brazil.

(5) 1995. Visiting scholar lecture: "The ecology of ectomycorrhizal fungi in the forests of the Pacific Northwest". National University of Cordoba, Interdisciplinary Institute of Plant Biology, Cordoba, Argentina.

(4) 1993. Assessing cryptic species diversity - Ectomycorrhizal fungi in the Pacific Northwest: Community structure and function. 9th North American Conference on Mycorrhizae. Guelph, Ontario, Canada.

(3) 1992. Visiting scholar lecture: "Diversity and mycorrhizal ecology of the Monotropoidae in North America." Institute of Forest Mycology and Pathology, Swedish University of Agricultural Sciences, Uppsala, Sweden.

(2) 1988. Truffles in Douglas-fir forests: when, where, how many. Second North American Truffle Congress. Santa Rosa, Calif.

(1) 1988. Variation in hypogeous sporocarp production by mycorrhizal fungi from forest stands of the H. J. Andrews Experimental Forest. Symposium: Old-growth Forests of the Pacific Northwest. Forestry Environment and Silviculture Division 1 of the International Union of Forestry Research Organizations and the College of Forestry, Oregon State University. Corvallis, Ore.

b. *Regional:*

(15) 2006. The history of botanizing in Douglas County. Special Event Lecture, 40th Anniversary of the Glide Wildflower Show. Glide OR.

(14) 2006. Fungus-feeding wildflowers that lurk in our woods. Special Event Lecture, 40th Anniversary of the Glide Wildflower Show. Glide OR.

(13) 2006. Truffle diversity and ecology in the Pacific Northwest. Oregon Truffle Festival. Eugene, OR.

(12) 2005. Fantastic fungi fuel forest growth. Yachats Mushroom Festival. Yachats, OR.

(11) 2004. Fungi, fire, and silviculture. The Annual Tri-Forest Ecosystem Workshop, Gold Beach, OR. USDA Forest Service, Umpqua, Siskiyou, and Rogue National Forests.

(10) 2002. The roles of fungi in forested ecosystems. The Annual Tri-Forest Ecosystem Workshop, Gold Beach, OR. USDA Forest Service, Umpqua, Siskiyou, and Rogue National Forests.

(9) 1999. The ties that bind: fungi in ecosystems. Green-tree Retention Workshop – Interdisciplinary Information for Forest Managers. USDA Forest Service, Pacific Northwest Research Station. Eagle Creek, Oregon.

(8) 1997. Ectomycorrhizae in the western Siskiyou Mountains. The First Conference on Siskiyou Ecology. Siskiyou Regional Education Project, Cave Junction, OR

(7) 1995. Biodiversity of ectomycorrhizal types from southwest Oregon. Symposium on Conservation and Management of Oregon's Native Flora. Native Plant Society of Oregon. Corvallis, Ore.

(6) 1994. Mushroom, truffle, and mycorrhiza diversity in southwest Oregon. Conference: Ecosystem management of forest fungi. USDA Forest Service,

Pacific Northwest Research Station and the Cascade Center for Ecosystem Management. Corvallis, Ore.

(5) 1994. Wild fungi biology and management. Conference on the business and science of special forest products. Western Forestry and Conservation Association. Hillsboro, Ore.

(4) 1992. Mysteries of the Indian pipe and its relatives. Wild mushroom conference. Breitenbush Conference Center. Breitenbush, Ore.

(3) 1992. Mycorrhizal fungi in ecosystems. Symposium: Wildlife biologists as advocates; the link between science and survival. The Wildlife Society, Oregon Chapter. Annual meeting & symposium. Bend, Ore.

(2) 1991. Fungi in older forests of the Pacific Northwest. Other species – ecosystem issues. Northern Spotted Owl Recovery Team. Portland, Ore.

(1) 1989. Fungal communities in young, mature, and old–growth Douglas–fir forests in Oregon. Symposium: Old–growth Douglas–fir Forests: Wildlife Communities and Habitat Relationships. USDA Forest Service, Pacific Northwest Research Station. Portland, Ore.

8. Volunteered Presentations

a. *International/National:*

(2) 2003. Effects of spore inoculum on the ectomycorrhiza diversity of Douglas-fir seedlings. Combined Annual Meetings of the Mycological Society of America and the British Mycological Society, Pacific Grove, CA.

(1) 2002. Conservation of biodiversity: effects of green-tree retention on ectomycorrhizal fungi. Annual Meeting of the Mycological Society of America, Corvallis, OR.

b. *Regional/Local:*

1985 to present. Innumerable talks on monotropas, mushrooms, truffles, vegetation studies, and wildflowers to: University ecology seminars, many Native Plant Society chapters, the North American Truffling Society, the Los Angeles Mycological Society, the Cascade Mycological Society, the Bellingham Mushroom Club, and the Willamette Valley Mushroom Club.

c. *Students' Presentations:*

(6) Jacobs, K.M., Castellano, M. Cazares, E., Luoma, D.L., and Trappe, J.M. 2002. The truffle-like fungi of northern temperate forests. Annual Meeting of the Mycological Society of America, Corvallis, OR. June 24–27.

(5) Jacobs, K. and Luoma, D.L. 2001. Response of small mammal mycophagy to differing levels and patterns of green-tree retention in mature forests of western Oregon and Washington. Annual Meeting of the Northwest Scientific Association. Arcata, CA. March 21-24.

(4) Kolaczkowski, O., Luoma, D.L., and Eberhart, J.L. 2001. Molecular evidence for the identity of ectomycorrhiza root type "8a" as *Suillus lakei*. Annual Meeting of the Northwest Scientific Association. Arcata, CA. March 21-24.

(3) Jacobs, K. and Luoma, D.L. 2001. Response of small mammal mycophagy to differing levels and patterns of green-tree retention in mature forests of western Oregon and Washington. Annual Meeting of the American Society of Mammalogists. Missoula, MT. June 16 – 20.

(2) Kolaczkowski, O., Eberhart, J.L., and Luoma, D.L. 2000. DNA evidence for the identity of ectomycorrhiza root type "8a" as *Suillus lakei*. The 9th Annual Ronald E. McNair National Research Conference and Graduate School Fair. Mid-American Association of Educational Opportunity Program Personnel and Univ. of Illinois at Urbana-Champaign. Lake Lawn Resort, Delavan, WI. Nov. 3-5.

(1) Stockdale, C.A., and Luoma, D.L. 2000. Spatial and productivity relationships of mycorrhizal diversity in thinned Douglas-fir stands. Northwest Scientific Association Annual Meeting. Moscow, Idaho.

9. Research Support Received

My funding has been largely through agreements with the USDA Forest Service. I endeavor to answer questions about soil biology in the context of science-based adaptive management. My ability to work at the interface of basic and applied science enhances the success of collaborative research that involves scientists and managers. Of particular importance to the funding agency are my expertise with the identification of ectomycorrhizal fungi, knowledge of experimental and sampling designs appropriate for fungi, data analysis skills, and biogeography of the region. This ongoing scientific relationship reflects confidence in my science and grant administration capabilities.

a. Competitive Grants and Contracts

Mycorrhizal Mediation of Plant Colonization, Community Development, and Carbon Accretion on a Glacier Forefront. Trappe, J., Matson, K., **Luoma, D**., and Caldwell, B. National Science Foundation, $200,000. 1993-96.

Mycorrhizal Ecology of Plant Colonization of Glacier Forefronts. Trappe, J. and **Luoma, D.** National Science Foundation, $40,000. 1989-90.

b. Non-competitive Grants and Contracts

Biological diversity and management of forest fungi in the Pacific Northwest. **Luoma, D.** USDA Forest Service, $112,548. 2006-2007.

Are differences in the ectomycorrhizal community correlated with Swiss needle cast severity? **Luoma, D.** Swiss Needle Cast Cooperative, $19,500. 2006.

Biodiversity of root symbionts found in the sensitive species *Cypripedium montanum*. **Luoma, D.** and Eberhart, J. Kelsey Creek Labs, $10,000. 2005-2006.

Effects of harvest technique on subsequent matsutake production. **Luoma, D.** USDA Forest Service, $16,770. 2005-2006.

Use of Spatial and Temporal Partitioning of Genetic Variation in *Cantharellus formosus* to Model Aspects of Gene Flow in Fungal Populations in Pacific Northwest Forests, Modifications #4 & 5. **Luoma, D.** USDA Forest Service, $168,705. 2004-2006.

Biodiversity of root symbionts found in the sensitive species *Cypripedium montanum*. **Luoma, D.** and Eberhart, J. USDA Forest Service, $11,340. 2004-2005.

Effects of Fungal Spore Inoculum on the Survival, Growth, and Ectomycorrhiza Diversity of Out-planted Douglas-fir Seedlings. **Luoma, D.** and Eberhart, J. USDA Forest Service, $169,600. 2003-2007.

Ecosystem effects of the Biscuit fire across the long-term ecosystem productivity experiment: Response of ectomycorrhizal fungi. **Luoma, D.** and Eberhart, J. USDA Forest Service, $69,300. 2003-2004. [Peer-reviewed]

Assessment of the Conservation Ranking of Rare Fungi. **Luoma, D.** Oregon Natural Heritage Information Center. $13,500. 2002-2003.

Use of Spatial and Temporal Partitioning of Genetic Variation in *Cantharellus formosus* to Model Aspects of Gene Flow in Fungal Populations in Pacific Northwest Forests, Amendment #1. **Luoma, D.** USDA Forest Service, $138,600. 2002-2004.

Initial Post-treatment Assessment of Green-tree Retention Effects on Ectomycorrhizal Fungi: DEMO. **Luoma, D**. and Eberhart, J. USDA Forest Service, $160,012. 2001-2002. [Peer-reviewed]

Use of Spatial and Temporal Partitioning of Genetic Variation in *Cantharellus formosus* to Model Aspects of Gene Flow in Fungal Populations in Pacific Northwest Forests. **Luoma, D.** USDA Forest Service, $126,777. 2001-2003.

Monitoring of Fungal Diversity at the Siskiyou Integrated Research Site with Special Reference to Survey and Manage Species. **Luoma, D.** USDA Forest Service, $20,000. 2000-2001.

Community Structure and Dynamics of Ectomycorrhizal Fungi in Managed Stands: DEMO. **Luoma, D.** USDA Forest Service, $550,620. 1997-2001. [Peer-reviewed]

Effects of Habitat Fragmentation and Life History Variability on Genetic Population Structure of Pacific Northwest Forest Fungi. **Luoma, D.** USDA Forest Service, $208,600. 1997–2001.

National Study for Long Term Site Productivity: The Diversity and Abundance of Ectomycorrhizal Fruiting Bodies. **Luoma, D.** and Cazares, E. USDA Forest Service, $65,079. 1995-2000.

Ripping Compacted Soils and the Diversity and Abundance of Ectomycorrhizal Fruiting Bodies. **Luoma, D.** and Cazares, E. USDA Forest Service, $125,600. 1995–2000.

Ecosystem Management of Commercially Harvested Forest Fungi. **Luoma, D.** USDA Forest Service, $204,821. 1994-99.

Evaluating Commercial Matsutake Harvest in the Pacific Northwest. **Luoma, D.** USDA Forest Service, $158,508. 1994-99.

Community Structure and Dynamics of Ectomycorrhizal Fungi in Managed Forest Stands. **Luoma, D.** USDA Forest Service, $376,240. 1993-98.

Wildlife Food Resources - Assessing the Contributions of Fungi in Managed Forest Stands. **Luoma, D.** USDA Forest Service, $16,800. 1994-95.

Effects of Thinning Douglas-fir Stands on Production of Hypogeous Fungi and Their Use as Food by Northern Flying Squirrels. Trappe, J. and **Luoma, D.** USDA Forest Service, $175,000 1993-96.

Changes in Ectomycorrhizal Diversity in Response to LTSP Treatments. **Luoma, D.** USDA Forest Service, $149,436. 1992–96. [Peer-reviewed]

Hypogeous Fungi of Swain Mt. Experimental Forest. **Luoma, D**. USDA Forest Service, $7,700. 1993-94.

Mycorrhizal and Associated Microbiological Phenomena in Rehabilitation of Degraded Recreational Sites in Subalpine and Alpine Habitats. Trappe, J. and **Luoma, D.** USDA Forest Service, $102,193. 1992-95

Chloropicrin Effects on Higher Plants. **Luoma, D.** USDA Forest Service, $19,900. 1991-93.

Live Tree Fumigation Effects on Higher Plants. **Luoma, D.** USDA Forest Service $4,600. 1991-93.

Mycorrhizal Fungus Diversity in Managed and Undisturbed Forests. **Luoma, D.** USDA Forest Service, $83,183. 1990-93

Mycorrhiza Enhancement of Wildland Plants. Trappe, J. and **Luoma, D.** USDA Forest Service, $129,000. 1989-92.

D. Service

1. University, College, and Department

Elected Member, Forestry Leadership Team, representing fixed-term faculty, 2003-2006.

Member, Forest Science Space Allocation and Policy Development Committee, 2001-2002.

Chair, Department subcommittee for Senior Faculty Research Assistant evaluations, 2000-01 (3 candidates).

Member, Forest Science Quantitative Sciences Position Description Development Committee, 2000.

Member, Board of Practitioners for the Department of Botany and Plant Pathology, 1997.

Member, Forest Science Department Faculty and Staff Development Committee, 1996 to present.

Research Associate Representative, Forest Science Department Management Committee, 1995 to 1997.

2. Professional

Peer-review Service:

I have been on the editorial board of the journal "Descriptions of Ectomycorrhizae" since 1996. Additionally, I have conducted over 14 reviews of manuscripts for journals such as Canadian Journal of Forest Research, Canadian Journal of Botany, American Journal of Mammology, Mycological Progress, Forest Ecology and Management, and Mycorrhizae. I have provided at least 8 reviews of USDA, National Research Initiative competitive grants.

Society Service:

1987 to present. Chair, Budget Committee and Chair, Field Research Grants Committee, Native Plant Society of Oregon.

2006 – 2008. Vice-president, Native Plant Society of Oregon.

2003 – 2005. Director at Large, Native Plant Society of Oregon.

1999 – 2007. Treasurer, Corvallis Chapter, Native Plant Society of Oregon.

1999 – 2002. Director at Large, Native Plant Society of Oregon.

1990 – 1995. Treasurer, Corvallis Chapter, Native Plant Society of Oregon.

1990 – 1993. Vice-president, Native Plant Society of Oregon.

1989 – 1990. Immediate–past President, Native Plant Society of Oregon.

1987 – 1989. President, Native Plant Society of Oregon.

1986 – 1987. Vice president, North American Truffling Society

1985 – 1987. Vice president, Corvallis Chapter, Native Plant Society of Oregon.

1985 – 1987. Director at Large, Native Plant Society of Oregon.

1983 – 1985. President, Corvallis Chapter, Native Plant Society of Oregon.

International Meeting Service:

Workshop Organizer: “Diversity and structure of communities and populations”. With John Cairney, co-organizer. Second International Conference on Mycorrhizae. Uppsala, Sweden, July 9, 1998.

Session Organizer: "Mycoheterotrophy". With Johnathan Leake, co-organizer. First International Conference on Mycorrhizae. Berkeley, CA, Aug. 8, 1996. This non-concurrent session was presented to over 500 attendees. Fungal dependent achlorophyllous plants from ecosystems in various parts of the world were discussed. Implications for inter-plant carbon flow and new discoveries of the identity of the mycobionts were presented.

Pre-conference Workshop Organizer: Hypogeous fungi of the Sierra Nevada. With Efren Cazares, co-organizer. First International Conference on Mycorrhizae. July 31 - Aug. 3, 1996. The species list developed contributed to an ongoing study in the region. Discussions included: Collecting techniques; determination of research goals and objectives; experimental design and study layout; field techniques and study plot installation; data management and quality control. Twenty-six participants from 9 countries.

Post-congress workshop: Fungi and Forests. Fifth International Mycological Congress. Aug. 22 - 25, 1994. Co-organizer with Dr. George Carroll (University of Oregon). The topics of ectomycorrhizae, lichens, log decomposition, fungal endophytes, and forest pathology were covered by several instructors. About 25 participants, many international.

3. Public (professionally related)

1989-90. Chairman, Timber Sale Advisory Board, Salem District, Bureau of Land Management.

1980 to present. Volunteer mycologist for the Mt. Pisgah Arboretum Wild Mushroom Show.

1978 to present. Volunteer botanist for the Glide Wildflower Show, Oregon’s oldest and largest educational display of a regional flora.

4. Public (non-professionally related)

2003 - 2006. Volunteer fieldtrip leader as a fund raiser for the Oregon Mozart Players.

1999, 2000. Volunteer fieldtrip leader for the Oregon High Desert Museum.

1989 – 1991. Board of Directors, Environmental Federation of Oregon.

E. Honors, Awards, and Other Recognition

Selected as a Distinguished Alumnus for 2004 by Lane Community College, Eugene, Oregon.

The Distinguished Alumni Award recognizes its recipients for their achievements in their chosen profession, for their service to the community, or for their outstanding contribution to the college. This award represents excellence, service to community and country, character building, educational attainment and career success. See http://www.lanecc.edu/foundation/distalumni2004.htm for more information.