

Application for Continued Funding

of the

SATURNA ISLAND ECOLOGICAL RESERVE

MACRO-FUNGI INVENTORY

AND

LONG TERM FUNGI STUDY

To:

Friends of Ecological Reserves
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From:

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Introduction

I am coming to you again this year to ask for financial support for my study of the fungi of the Saturna Island Ecological Reserve. As you know, I was given a Park Use Permit for this project in August, 1997 for the purpose of making a long term inventory of the species present, their growth patterns and their relationship to their habitat and environment. Since that time I have made 37 field trips into the reserve and have made collections for 200 different species of the fungi I have found there.

At the same time I was also given a Park Use Permit to do similar work in Winter Cove Provincial Park. Influenced by your grant, among other reasons, I have chosen to focus more of my time on my work in the Ecological Reserve. The reasons for this are explained more fully in the enclosed Annual Fungi Report. This report to B.C. Parks details my work in the Park and the Reserve during the past year and also includes my plans for the coming year. Rather than repeat myself, I ask you to refer to pages 1, 2 & 3 of the text for a further explanation of my research, general observations, and my additional plans for next year.

My circumstances have not changed substantially since I made my first submission to you last year. I am still not affiliated with any University or other institution, nor do I have any source of outside funding other than that which you have given me.

Your generous grant last year enabled me to make many purchases which have greatly enhanced my research. These included a stage micrometer and an ocular micrometer which have given me the capability to measure the size of individual spores and photographic equipment that allowed me to take the pictures you see in my annual report. I also purchased some very good reference books and several chemical reagents and stains. For your information the books, chemicals and my actual expenses for May 1998 through February 1999, are listed at the end of this submission.

Annotated budget

As it was last year, my projected budget is part wish list, part anticipated unavoidable costs. A slide projector, refrigerator and a significant purchase of reference books will probably not be possible without your continued assistance. Office expenses, film and developing costs, field trip costs, microscope supplies and memberships will be maintained somehow, with or without outside assistance.

This budget does not include basic costs such as heat or electricity that are part of running a dedicated office in my home for this project. More importantly, it does not take into account the many hours of my time spent doing this work. Although this is a choice I make freely, it does affect my ability to earn a living. I am very lucky to have a husband that encourages and supports my decision to pursue this work, even though it has meant lowering our family income. I am also very grateful for the support I received from your organization. It has meant that I have been able to advance my research without it actually costing us too much money (other than the aforementioned loss of potential earned income). For these reasons, I am requesting your support for the entire amount of my proposed budget.

Reference Books

Because my research includes a general inventory of all the fungi of the Ecological Reserve, my reference library needs may seem endless. I believe this need can easily be understood by a look at some of the keys in David Arora's book Mushrooms Demystified, the "Bible" of amateur mycologists.

His key to the major groups of fleshy fungi contains eighteen major categories. Fourteen of these are basidiomycetes: Agarics; Chantrelles; Boletes; Polypores & Bracket Fungi; Jelly Fungi; Crust & Parchment Fungi; Teeth Fungi; Coral & Club Fungi; Gasteroid Agarics; Puffballs & Earthstars; Stalked Puffballs; Bird's Nest Fungi; Stinkhorns; and False Truffles. Five are Ascomycetes: Truffles; Flask Fungi; Morels, Elf Saddles & Cup Fungi; and Earth Tongues. These eighteen categories in turn lead to 511 genera containing over 2,000 listed species.

Mr. Arora points out that while over 2000 species are described, mentioned or illustrated in his book, there are many that are not. He further explains that "microscopic characteristics are *not* stressed" and therefore "many of the species mentioned briefly are merely suggestions as to what an unidentified mushroom might be, and many of the species that are fully described are actually "complexes" -groups of closely related species whose exact identities are a matter for the specialist."

I have found fungi in all of the eighteen major categories listed above, except for the Stinkhorns. I also work with a fascinating category of fungi that Mr. Arora does not address, the Myxomycetes or "Slime Molds", as they are more commonly known. The books that your grant allowed me to purchase last year, and those I hope to purchase in the future, allow me access to an even greater number of genera and species than those listed above. The fungi *Mucronella pendula*, shown on page 33 of my Annual Parks Report, is just one example of a fungus I was able to identify because of the books I purchased last year. It is only mentioned in one of my reference books, Mushrooms of Idaho and the Pacific Northwest, Vol. 2 Non-Gilled Hymenomycetes by Edmund E. The technical descriptions in these books also allow me to make my identifications of both the common and the more obscure fungi with a far greater degree of accuracy than is otherwise possible.

While I have budgeted \$800, I could easily spend more. Please note that the prices listed do not include shipping, handling or GST and are in U.S. dollars.

Some of the titles I'm interested in are: Ainsworth & Bisby's Dictionary of the Fungi (\$70.00 U.S.); Keys to Pacific Northwest Mushrooms (\$51.75 U.S.); Ramaria of Western Washington (\$45.00 U.S.); The Myxomycetes (\$80.00 U.S.); Type Studies of North American and other related taxa of Stipitate Hydnums: Genera: Bankera, Hydnellum, Phellodon, Sarcodon (\$50.00 U.S.); The Boletes of North America (\$10.00 U.S.); The Thelephoraceae of North America (\$50.00 U.S.); The Clavarias of the United States and Canada (\$9.95 U.S.); The Illustrated Genera of Ascomycetes (\$45.00 U.S.); North American Species of Gymnopilus (\$15.00 U.S.); Cultural Studies and Identification of Wood Inhabiting Corticiaceae and Selected Hymenomycetes from North America (\$105.00 U.S.); The Genus of Clavulinopsis in North America (\$12.50 U.S.); Ramaria Subgenus: Lentoramaria, with emphasis on North American (\$35.00 U.S.); A Study of Cystidia in Effused Aphyllopharales (\$40.00 U.S.); A Contribution towards a Monograph on North American Species of Suillus (\$10.00 U.S.); Mushrooms of Idaho and the Pacific Northwest Vol. 1: Discomycetes (\$13.95 U.S.); The Pyrenomycetes Fungi (\$80.00 U.S.); A world monograph of the Genus Pseudobrophila (Pezizales, Ascomycotina) (\$45.00 U.S.); The Bird's Nest Fungi (\$30.00 U.S.); The veiled species of Hebeloma of the Western United States (\$42.50 U.S.).

Photographic Equipment

The grant I receive last year allowed me to expand my research to include photography. As I mentioned, this has resulted in the photos you see in my Annual Parks Report and

many more. I do not have a slide projector and so I chose to take my initial photographs as prints. Some of these were very nice, the lightened photo that is the cover of my parks report, the slime mold pictured on its index page and the cover of this submission are copied from these prints. However, I quickly decided that slides would produce a better quality picture and that they would also better allow me to make presentations to share my pictures with other should the opportunity arise. And indeed, it already has. Harvey Janszen, my husband and warden of our Ecological Reserve, showed several of my slides to the B.C. Parks Ecological Reserve Warden's Meeting in January where they were very favorably received. And now I have been invited to make a presentation to the Vancouver Mycological Society at their April 6th meeting regarding my research on Saturna Island. When putting together a presentation it would help me immensely to have a projector and screen at home. It would also be very useful when viewing new the slides I have taken so that I can assess their quality and know which fungi I might need to re-photograph. I currently have a small hand-held battery operated viewer which serves these purposes, albeit not very satisfactorily. Fortunately, both B.C. Parks and the Vancouver Mycological Society have projectors available, but having my own projector and screen would also allow me to share this research with others who might not have this equipment at hand.

Refrigerator

When I make a field trip into the reserve the average time I'm away from home is three to four hours. I usually chose the afternoon for these hikes as I often have several things I have to attend to before I can go "play" in the woods. The woods are generally drier in the afternoon as well which makes for much a much nicer hike. Even at those times of the year when the common gilled fungi are not abundant, there are always plenty of fungi to collect. These are the times when I can give my attention to fungi such as the perennial woody "conks", the crusts and the parchment fungi. Consequently, nearly every hike is followed by several hours of work at home making spore prints, looking in microscopes, testing with chemical reagents, delving through reference material, recording the information and preserving the specimens. Most of this work requires immediate attention and I will often be at my desk from the moment I get home and will still be working at 11:00 p.m. that night trying to get as much done as possible before the fungi deteriorate. In times of great fungal abundance, I sometimes loose specimens altogether as they deteriorate before I am able to get to them. I also know that as the evening wears on and I become more and more tired, I am not thinking as clearly as I would be if I could resume this work after a nights sleep. If I had a refrigerator I could prepare these specimens to collect spore prints, refrigerate them to maintain them in optimal condition, then work through the early evening and then continue this job the following day. My kitchen refrigerator will not serve this function for two reasons. First, these specimens need to be laid out flat on trays and there is usually not room to accommodate them in the kitchen refrigerator. Secondly, fungi keep best when not enclosed in plastic and I am not comfortable having what are often very poisonous fungi, usually contaminated with a variety of bugs and mouse and slug feces, side by side with my food.

Film and developing

These costs are relatively modest as last fall I had the opportunity to purchase several roles of pre-paid processing slide film on sale and I still have 6 unused rolls left. I anticipate the majority of my costs will involve making prints from slides so that they can be used in my next annual report.

Microscope supplies

This item consists mostly of plastic slides and cover slips, but also occasionally includes replacements for burnt out bulbs.

Office supplies

My major expense relates directly to the production of my Annual Parks Report. This year I made four copies, one for B.C. Parks, one for The Vancouver Mycological Society, one for the Southern Vancouver Island Mycological Society and one to include with this submission to your organization. With the addition of color photographs, the photocopying costs are quite expensive. At this time, I anticipate submitting copies of next years report to these same organizations. Other office costs include photocopying of my field checklists, field note books, occasional phone calls, postage, pens, paper, ink ribbon cassettes and freezer bags for specimen storage.

Field trips

I have budgeted the average cost per field trip conservatively at \$5.00. This includes gas which is fortunately not a major expense as the reserve is close by. It also allows for a snack, usually a drink and a candy bar for myself and my husband if he is along. He accompanies me whenever possible and is my chief photographer and camera gear carrier. I find carrying my collecting gear to be a full load so it is with his help that we have most of the photographs. He is also doing the terrestrial ecosystem analyses of the bioterrain map polygons of the reserve and helping me cross reference my trails to these polygons. My only other field expense is survey tape which I use marking the reserve boundries and trails and in tagging sites I want to moniter.

Memberships

I currently belong to NAMA - the North American Mycological Association and SVIMS - the South Vancouver Island Mycological Society. Belonging these organizations give me access to their newsletters, publications and their members with whom I can exchange information and get help when I need it. Through my membership in the South Vancouver Island Mycological Society, I have met Christine Roberts, who is doing a taxonomic study of *Russula* in B.C. for her Ph.D. at UVIC and I have added collecting *Russula* specimens from Saturna in aid of her study to my volunteer work. You will notice that two specimens listed in my Annual Fungi Report are with her. She has also invited me to take part in a general fungi inventory and research study she is conducting in the Clayoquot Sound area. Although this will be as an unpaid volunteer, my expenses will be paid and it is a very exciting opportunity. The cost of belonging to NAMA is \$17.00 U.S. and SVIMS is \$15.00 Cdn. With the exchange, money orders and cheque costs added, I have estimated \$50.00 for this item.

Requested budget

Books	\$800.00
Slide projector & screen (used)	\$350.00
Film & developing	\$100.00
Refrigerator (used)	\$300.00
Microscope supplies	\$100.00
Office expenses	\$270.00
Field trips	\$220.00
Memberships SVIMS & NAMA	\$ 50.00
Total	<hr/> \$2,190.00

Reference Books Purchased in 1998

Castellano, M.A., J.M. Trappe, Z. Maser & C. Maser (1989). KEY TO SPORES OF THE GENERA OF HYPOGEOUS FUNGI OF NORTH TEMPERATE FORESTS WITH SPECIAL REFERENCE TO ANIMAL MYCOPHAGY. Eureka: Mad River Press.

Gilbertson, R.L. & L. Ryvarden (1986). NORTH AMERICAN POLYPORES VOL. 1. Oslo: Fungiflora.

Gilbertson, R.L. & L. Ryvarden (1987). NORTH AMERICAN POLYPORES VOL. 2. Oslo: Fungiflora.

Katsaros, P. (1987). ILLUSTRATED GUIDE TO COMMON SLIME MOLDS. Eureka: Mad River Press.

Largent, D.L., D. Johnson & R. Watling (1977). HOW TO IDENTIFY MUSHROOMS TO GENUS III: MICROSCOPIC FEATURES. Eureka: Mad River Press.

Largent, D.L. & T. Baroni (1988). HOW TO IDENTIFY MUSHROOMS TO GENUS VI: MODERN GENERA. Eureka: Mad River Press.

Læssøe, T. (1998). EYEWITNESS HANDBOOKS: MUSHROOMS. Toronto: Stoddart.

Miller, O.K. Jr. & H.H. Miller (1988). GASTEROMYCETES: MORPHOLOGICAL AND DEVELOPMENTAL FEATURES. Eureka: Mad River Press.

Smith, A.H. & L.R. Hesler (1968). THE NORTH AMERICAN SPECIES OF PHOLIOTA. Monticello, N.Y.: Lubrecht & Cramer.

Thiers, H.D., Editor of THE AGARICALES OF CALIFORNIA. Eureka: Mad River Press.

#1 - AMANITACEAE by Harry D. Thiers (1982)

#2 - CANTHARELLACEAE by Harry D. Thiers (1985)

#3 - GOMPHIDIACEAE by Harry D. Thiers (1985)

#4 - PAXILLACEAE by Harry D. Thiers (1985)

#5 - HYGROPHORACEAE by David L. Largent (1985)

#6 - AGARICACEAE by Rick Lerrigan (1986)

#7 - TRICHOLOMATACEAE (MARASMIOID FUNGI) by Dennis E. Desjardin (1987)

#8 - ENTOLOMATIOD FUNGI OF THE WESTERN UNITED STATES AND ALASKA
by David L. Largent (1994)

#9 - RUSSULACEAE - RUSSULA by Harry D. Thiers (1997)

#10 - RUSSULACEAE - LACTARIUS by Andrew Methven (1997)

#11 - TRICHOLOMATACEAE - TRICHOLOMA by Kris Shanks (1997)

Tylutki, E.E. (1987). MUSHROOMS OF IDAHO AND THE PACIFIC NORTHWEST VOL. 2 NON-GILLED HYMNOMYCETES. Moscow: University of Idaho Press.

Chemical Reagents Purchased in 1998

Congo Red: stain for hyphae walls

Cotton Blue: stain for selected hyphae walls, chrysocystidia, spore walls and spore ornamentation

Ethanol: wetting agent

Gum Guaiac: aids in determining if a wood decaying fungi causes white rot or brown rot

Hydrochloric Acid: produces microchemical color reaction used to distinguish hyphae and cells in selected agarics

Melzer's Reagent: determines whether the material is amyloid, dextrinoid or inamyloid

Methylene Blue: determines metachromatic reaction in selected material

Phloxine: stain for hyphae interior

Sulphformol (Sulfofomol): produce macro and microchemical color reactions in selected agarics, particularly russula species

Sulphuric Acid: discolors psathyrella spores

Actual expenses in 1998

Books (includes shipping, handling & GST)	\$930.00
Chemicals	\$450.00
Camera equipment (28-70mm macro lens & tripods)	\$532.00
Film and developing	\$116.00
Microscope supplies	\$245.00
Office supplies	\$257.00
Field trips (Ecological Reserve only)	\$170.00
Memberships, SVIMS & NAMA	\$ 50.00
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Total	\$2,750.00