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servation District; Wasilla Soil and Water Conservation District; Upper Susitna Soil and Water Conservation District; and Cameron Birch Syrup and Confections, Inc.

A conference proceedings and a CD with additional information are scheduled for publication in December 2002 by the USDA Forest Service Pacific Northwest Research Station, Portland, Oregon. Information about the proceedings will be posted on the Alaska Soil and Water Conservation District website: <www.alaska.swcds.org/alaska>.

For additional information about the conference and the proceedings, contact:

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HOPES FOR A MUSHROOM CRAFT COTTAGE INDUSTRY LINKED TO FUNGI RESEARCH

Interest in starting a cottage industry based on crafting of wild mushrooms in Southeast Alaska prompted the University of Alaska Fairbanks Cooperative Extension Service (CES) to sponsor a study of the interactions and relationships between fungi and their environment that included an initial inventory of fungi on Prince of Wales Island in 2001.

CES funded the study by B. Luke Bruner, a student of mycology at UAF, and Gary Laursen, Senior Research Scientist, UAF Institute of Arctic Biology, with a grant from the Cooperative State Research, Education, and Extension Service (CSREES). Bruner and Laursen recently issued findings of the study in an annual report and working document, *Forest Interactions: Fungi as Model Organisms for Illustrating the*

Web of Life, an electronic publication.

Mycorrhizal fungi, which form symbiotic (mutually beneficial) relationships with the rootlets of plants (mostly trees) called mycorrhiza, were the focus of their

study in the distribution of mycorrhizal fungi. A mammal of special interest to researchers is the Northern Flying Squirrel, whose scat samples collected on Prince of Wales Island in Spring 2000 by

“Low-intensity, long-term monitoring and inventory development are mandatory to assess species and species availability because their presence and abundance is linked to environmental parameters. This knowledge is essential to the success of a cottage value-added industry that uses cryptogams.”*

— Gary Laursen, Senior Research Scientist, UAF Institute of Arctic Biology

*Cryptogams include mushrooms.

study.

In addition to inventory, researchers collected information on the roles that small mammals play

Winston Smith and Jeff Nichols of the USFS Juneau Forestry Sciences Lab contained spores of hypogeous fungi, which fruit



A squirrel scampers up a tree after dining at a mushroom patch at the base of the tree in Southeastern Alaska. Mushrooms form mutually beneficial relationships with rootlets of trees and other plants, report Luke Bruner and Gary Laursen in *Forest Interactions: Fungi as Model Organisms for Illustrating the Web of Life*. "...Fungal mycelia form a sheath of hyphae around the rootlets of host phanerogams and an exchange of nutrients takes place," the authors note. "The rootlets provide the fungi with moisture and organic compounds (such as carbohydrates), while the fungus aids the roots in the absorption of phosphorous, inorganic nitrogen, and other minerals, supporting complex photosynthetic and other biochemical processes" (p. 2).

above ground, and epigeous fungi, which fruit underground and commonly are called truffles.

However, results of analyses of the squirrels' fecal samples are inconclusive in relation to the abundance or location of fungi, according to Laursen and Bruner. "This data base will be developed further as more information is collected and spore identification is verified," they added (p. 17).

Their report includes numerous photos of fungi found on Prince of Wales Island and several photos of flying squirrels. It also contains photos of fungi found elsewhere in Southeast Alaska, photos of Sitka lichen, a spore morphotype database, and a forest interactions poster. The poster illustrates forest interactions involving hypogeous

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fruit bodies of ectomycorrhizal fungi, the truffles, and the small mammals that use truffles as a primary food source. As explained on the poster, truffles are dependent on animals to dig them up, consume them, and then deposit their spores as fecal pellets. Flying squirrels concentrate the spores with yeast, nitrogen-fixing bacteria, and the nutrients needed to establish mycorrhiza. Analysis of fecal pellets indicates the presence of hypogeous fungi in Southeastern Alaska.

An inventory of fungi is an essential step in assessing the capability of Southeast Alaska forests to support the use of wild mushrooms and other cryptogams as non-timber forest products (NTFPs). As the authors note in their report, "Little is known of the roles that fungi and other cryptogams (non-flowering spore producing 'plants') play in northern forests...."

"Our limited sample size from our first field season in Southeast Alaska cannot reflect the full diversity of fungi and fungal relationships," the authors continued. "Also, because of the ephemeral nature of fungi sporocarps, fruiting only under certain conditions, a specific fungus may not be detected despite its perennial presence. As with all research, questions tested lead to even more unanswered questions, rather than concrete cause and effect results, further demonstrating the ultimate complexity and interconnectedness of the system questioned" (p. 19).

"Low-intensity, long-term monitoring and inventory development are mandatory to assess species and species availability because their presence and abundance is linked to environmental parameters," Laursen told participants in the First Alaska-Wide Non-Timber Forest Products Conference held in November

2001 in Anchorage. "This knowledge is essential to the success of a cottage value-added industry that uses cryptogams." (As defined by Laursen at the conference, cryptogams include mushrooms; lichen; mosses; parasites of mosses, lichen, and mushrooms; slime molds; fern; horse-tails; and club mosses.)

Laursen noted that data gleaned from research could be used to

- assess cost effectiveness, renewable and sustainable harvesting;
- provide forest managers with information to engage in proactive, cause and effect assertions;
- develop a meaningful, non-burdensome permitting system; and
- bring knowledge of Alaska Native Elders into land and resource management guidelines.

In addition to funding provided by CSREES, Bruner and Laursen received assistance from Linda Christian, Forester, USFS Wood Utilization Center in Sitka; Winston Smith, USFS Juneau Forestry Sciences Lab; Ellen Lance, USFS Thorne Bay Ranger District, and Kim Hastings, US Fish and Wildlife Service. Laboratory work was conducted in the UAF Mycology Lab.

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