

continued from front page

Research such as this serves to point out the complexity and interrelatedness of ancient forests. Trees, plants, animals and fungi are all interdependent. In reality we have barely begun to understand how old-growth forests function. For years small mammals such as those that inoculate the soil with mycorrhizae were treated as forest pests and managers did their best to eliminate them from forest plantations. Ironically, research is now finding these animals to be of utmost importance in maintaining a healthy and productive forest.

In a recent article in the *Journal of Pesticide Reform* (**An Overview of Sustainable Forestry**, January 1988) David A. Perry notes that sustainable forestry seeks to maintain the long-term productivity of the forest, which is very different from maximizing the production of wood fibre in a single rotation. Indeed, Perry maintains that maximizing productivity in the short-term, the current approach, often reduces productivity over the long-term.

Perry compares sustainable forestry to a milking stool which cannot stand without its three, equally important legs: (1) maintaining soil quality, and retaining both the (2) ecological and (3) genetic diversity of the forest. Wholistic forester Herb Hammond adds to this, noting that the atmosphere is the seat which holds the stool together. The essential message here is that only by maintaining the integrity of the forest ecosystem can the long-term productivity of the forest be maintained.

Old-growth forests are far more diverse than are plantations of fast growing 'super trees'. Ecological diversity refers to the diversity of plant, fungal, and animal species present, and the structural diversity of the forest. Structural diversity refers to such characteristics as age distribution of trees in a stand, the number of canopy or shrub layers present, and the presence of a variety of habitat such as fallen logs, snags and so on. Intensively managed plantations lack the sort of ecological and structural diversity which old-growth forests have developed.

Genetic diversity refers to the diversity of genotypes within a species. In the pristine old-growth forests of the Pacific northwest there has been a tremendous amount of genetic diversity built up over thousands of years of uninterrupted ecological development. Trees, other plants and animals are superbly adapted to specific local site conditions. This diversity is contrasted with monoculture (at best two or three species of trees) plantations consisting of trees selected for their rapid and tall growth.

In general, ecologists agree that increased ecosystem diversity means increased ecosystem stability or resilience. Ecological diversity, uneven aged stands consisting of a number of different species for example, and genetic diversity enable forests to better withstand such threats as fire, insect and disease attack, and drought. Given the degree of environmental uncertainty we are faced with (eg. the 'greenhouse effect') Perry and others feel that we should, at this point be trying to retain as much ecological and genetic diversity in our forests as possible.



Focusing on the System

Industrial forestry has tended to focus on the goal of producing 'commercial' tree species for timber rather than on maintaining long-term forest productivity and diversity. Thus, valuable pioneer species, such as alder, which prepare the soil for trees which predominate in later seral stages, are viewed as weeds and are eliminated through the use of herbicides or other methods.

Alder makes an extremely valuable contribution to forest productivity by enriching the soil with nitrogen, one of the major factors limiting tree growth. Alder forms root associations with nitrogen fixing bacteria which can take atmospheric nitrogen and convert it to a form which can be used by plants. Through this association alder can enrich forest soils at rates of 110 to 440 pounds of nitrogen per acre.

In their rush to see that 'commercial' tree species are established on cleared areas, foresters eliminate one of nature's most efficient forms of fertilization, the alder. As Chris Maser notes in *The Redesigned Forest*, we focus too much on the end product (timber) and not enough on the process (the ecosystem) which produce the product. By failing to see how the health and viability of the forest is dependent on the health and viability of all the constituent parts of a forest, we endanger the sustainability of the forest. By not recognizing the contribution being made by 'non-commercial' species, such as alder, mycorrhizae and small mycophagist mammals we are placing limits on the sustainability of the future forest.

By eliminating the remaining large tracts of ancient forest we are also placing severe restrictions on the future sustainability of the forest. As Chris Maser notes, old-growth systems are "true sustainable forests", and we need to study them if we are to learn how to practice truly sustainable forestry. Maser calls the conversion of old-growth systems to managed plantations "redesigning the forest", and questions the assumption made by forest economists and managers, that future young-growth forests will produce as much or more wood fibre per acre as old-growth forests. As Maser writes in *The Redesigned Forest*

One of the most easily observed characteristics of temperate rainforests is their size. In old-growth systems dominated by Douglas fir or Sitka spruce the canopy can average 200 feet in height. On productive sites the canopy may tower to 275 feet, with exceptional individuals exceeding 300 feet. Other species are better known for their girth. Western red cedar trees have been found with a circumference greater than 65 feet. However, the ancient forests of the Pacific northwest are more than just large old trees; they are a unique combination of characteristics which provide for a great diversity of plant and animal life.



Graphic: The Charlatan



## In Recognition

University of Prince Edward Island Recognition Award was presented to Sherri Ega by James Griffith and Mario Basha of the Student Services Department. The award was given to Ms. Ega in recognition of her commitment to first year students through her participation in the freshman advisement program. Congratulations on a job well done (as usual) Sherri!

