

designing with biological systems

Guest Editor **David Gale** introduces this edition of *EcoDesign*



IT IS now generally accepted that the way we live in industrialised countries is incompatible with the way natural systems work. The creation of pollutants, depletion of non-renewable resources and the destruction of natural habitats – all symptoms of a one way throughput consumer society – are degrading the environment to the detriment of many life-forms including ourselves. According to a recent report by WWF, 30 per cent of global natural habitat has been destroyed since 1975.

If we are to create a long-term stable society, we need to first understand the principles of how natural cyclical systems work and then apply these principles to design systems that enable human activity to integrate into the local and the global ecology. In practical terms, this means that we need to establish ways to provide our basic physical needs; food, water, energy and shelter as well as our emotional and spiritual needs, in a more environmentally acceptable manner.

This edition of *EcoDesign* focuses on how human activity and nature can begin to combine to form beneficial symbiotic relationships. It explains some of the basic principles of designing for the integration of biological and manmade systems, people and their environment, to provide ecologically sustainable systems; on Designing with Nature.

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Authors who are experienced practitioners in this field of design have written the articles. The approach that links their work relies on an understanding of biological systems through careful observation of nature. This understanding of nature can then be applied to provide designs that enhance our environment and work as one with the physical laws that bind all biological processes.

The principle of 'observation' is fundamental to Designing with Nature. The articles have been selected to demonstrate a broad range of examples in designing with biology: from the selection of unusual and useful plant species for garden designs, to the design of microclimates around buildings. From systems-design that employ whole communities of organisms to purify lakes, to plants that provide healthy indoor atmospheric conditions or provide high yielding forest gardens. This issue also explores the larger scale questions of the carrying capacity of the environment and strategic planning issues of sustainability. By understanding our place in the environment we can begin to concentrate on designing people into the ecology of the planet. As biological beings we need to ensure that our activities follow similar cyclical patterns to that of nature; for example our food production and nutrient recycling strategies are parts of the same cycle.

Designing with biology is different to designing inanimate manmade objects. Man-made objects, such as a car or building, require large amounts of energy for their production and maintenance and over time they tend to break down, degrade and eventually return to their constituent parts. With biological design, such as a forest garden or microclimate planting, the reverse is true. Normally a small amount of energy is required to set the system up, for example planting and mulching. Over time the system grows and balances itself out, requiring little external input. The system, if designed properly, will become self regulating with minimum maintenance and it increases in energy (biomass) over time. This demonstrates the fundamental difference between designing with manmade and living systems. It is evident that if we can learn to design with this kind of biological system we will be able to enhance our surroundings and reduce our energy demands.

The intent of this collection of articles is to show we can begin to produce our food and water, locate and construct our buildings and manage our natural resources and energy demands in a way that is compatible with the wider environment. By combining man-made and biological design we can not only prevent environmental degradation, but through good design, it is possible to improve the natural environment, increasing yields and wildlife habitats. ■