BUDDHISM AND DEEP ECOLOGY FOR PROTECTION OF WILD ASIAN ELEPHANTS IN MYANMAR: A RESOURCE GUIDE

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TROPICAL FORESTS ♦ PROTECTED AREAS ♦ NATIONAL PARKS
DEEP ECOLOGY ♦ ECOTOURISM ♦ PUBLIC PARTICIPATION
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Resource Guide Review by Alan Rabinowitz, Ph.D.

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Dr. Henning's resource guide, which combines Buddhist principles and Asian elephant conservation in Myanmar, is an innovative approach to Asian elephant conservation. I have never seen someone with a biological background such as Dr. Henning's attempt this approach in such a clear, concise manner. I found the resource guide to be an excellent potential teaching tool not only for Myanmar but also for any Buddhist country in which elephant conservation is an issue.

I could easily envision this guide as the first in a series of written materials that deals with such conservation issues, perhaps beyond elephants. I would think that any individuals or agencies interested in conserving Asian elephants would be interested in this guide and would want to help make it available to a wider audience.

Resource Guide Outline

I. THE ASIAN ELEPHANT

A. Cultural
B. Ecological and Conservation Issues
C. Conservation Measures

II. BUDDHISM AND DEEP ECOLOGY

A. Need for Spiritual Approach
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D. Wildlife (poaching)
E. Forest Protection (D and E are considered the two major elephant threats)

III. DHAMMA/ECOLOGY GLOSSARY

IV. APPENDIX: DHAMMA/DEEP ECOLOGY EXPERIENTIAL EXERCISES

Much of the scientific and conservation information on elephants was adapted from the following two sources:

John F. Eisenberg, George M. McKay, John Seidensticker, ASIAN ELEPHANTS, National Zoological Park, Smithsonian Institution, Washington, D.C. l990. (This book of research articles is considered to be the major work on the Asian Elephant.)

U Uga, CONSERVATION AND USE OF WILD ASIAN ELEPHANTS (*Elephas maximus*) Forestry Department, Ministry of Forestry, Government of the Union of Myanmar, 2000. (U Uga, past Director, Training and Research Development Division, Forest Department, Ministry of Forestry, West Gyogone, Insein, Yangon, Myanmar, recently completed a Smithsonian Research Fellowship in the USA.)

General and field information, including scientific and/or conservation aspects, elephants, Buddhism, the field work and workshops, and the resource guide, was obtained from Buddhist Monks and Buddhist lay people, protected area staff from the Nature and Wildlife Conservation Division, Forest Department, FREDA (a Myanmar NGO), the Wildlife Conservation Society, and WildAid. I wish to express my professional and personal gratitude to all individuals and groups who contributed to the resource guide in any way. Besides the actual research and writing in the field, it was valuable to conduct meetings and workshops for feedback and inputs on the developing resource guide. The author was also an ordained Buddhist Monk at Shwe Oo Min Monastery, Myanmar during a part of this work.

Although this resource guide is oriented toward Myanmar, it can be utilized in all Buddhist Asian countries that have populations of wild Asian elephants.

I. THE ASIAN ELEPHANT

A. CULTURAL

Wherever elephants and people coexist, various interactions are inevitable. In Asia, elephants and humans have been in intensive contact for thousands of years so the significance of elephants to people has become more complex and unique than other parts of the world. Besides being hunted for food by pre-agricultural man, the elephants assumed a new significance to the agricultural man. It became a beast of burden, an instrument of war, an object of reverence, a status symbol, an agricultural pest, and a resource to be exploited for the beauty of its ivory.

The elephant in Asia embodies great metaphysical importance and is considered unique among other domestic animals. Traditionally for over 3,000 years, Asian elephants have been driven to other areas or captured and trained for use in work, ceremony, and war. Perhaps 100,000 wild elephants were captured over the last century with estimates of two to four million captured throughout the history of domestication. Captive breeding has always been limited so animals to be tamed had been taken from wild populations with approximately one fourth to one fifth casualties. Throughout Asia today, elephants enjoy strict legal protection. Only the rare problematic animal is killed, and then only if other means fail.

Asian cultures recognize the Asian elephant as a symbolic animal. Elephants often symbolize wisdom, strength, and sacredness as the largest land animal. They are considered to be charismatic, wise, majestic, brave, and patient in Asian cultures; there are thousands of stories about elephants. As cultural and natural heritages, elephants played important roles in the history and life of both the religious and ruling communities, as well as in legends and folklore of society in general. Examples include historical and religious documents as well as relief sculptures on the walls of ruins.

In many Asian countries, elephants are considered as “higher” animals. Auspicious ceremonies in traditional customs employ elephants for carrying rulers and valued items. During the reign of Myanmar Kings, elephants were caught, tamed, and used for war against invaders and for ceremonial and religious occasions. Today, it is still common to find elephants used in ceremonial and religious occasions. Both Myanmar and Thailand consider a (extremely rare and unusual) white elephant be a highly significant sign of good luck, national pride, and power for their country. Wars have been fought to gain possession of white elephants. A young white tusker was recently captured in Myanmar and is currently on exhibit.

A historical and cultural significant example of an elephant from Thailand involves a legend in which a Buddhist relic miraculously divided itself in the fourteenth century. King Kuena enshrined half of the relic at the Royal Flower Garden Monastery (Wat Suan Dok) located in Chiang Mai City. The other half was placed on the back of an elephant to be enshrined wherever the animal was led by the gods, suggesting that supernatural forces determined its location on the mountain. A wildlife sanctuary was then established there along with Wat Phrathat-a Buddhist temple monastery near Doi Suthep’s mountain summit, to house the relic.

With the basic message of Buddhism as non-violence, elephants were often used as a simile in the Buddha's sermons. They were also frequently connected with his life and story. In the Jataka Tales about Buddha appearing in various animal forms in his past lives, the elephant often appeared with high moral values, while many of the tales involved elephants as patient and wise.

Buddha had a close relationship and familiarity with elephants during his younger years as a prince, as well as after leaving the palace and living mainly in forests. It was while riding an elephant as a prince with his servant that they observed a sick man, an old man, a dying man, and a holy man which exposed the young prince to suffering and a way out of suffering. A legendary story involves a male elephant driven to attack Buddha by an enemy. While his followers ran, the Buddha stood his ground until the elephant was just a few feet away. Then, the Buddha emitted a sound usually made by a female elephant. This caused the elephant to drop to his knees on the ground and to become peaceful and friendly toward the Buddha.

The Vinaya, in the Bhikkhu Manuel states: 3. "Unallowable Meats. The flesh of humans, elephants, horses, dogs, snakes, lions, tigers, leopards, bears, and panthers." Given the obvious human prohibition, Monks indicate that elephant meat was forbidden because of its connections to royalty and culture. Other animal meats were forbidden because of odors, which, in turn, could attract other predators to prey on the Monks who did happen to eat these animal meats.

B. ECOLOGICAL AND CONSERVATION ISSUES

The Asian elephant (*Elephas maximus*), an endangered species listed in Appendix I of CITIES, is thought to number between 34,000 to 56,000 in thirteen Asian countries. According to U Uga, there are less than 4,000 elephants in the wild in Myanmar, which has the largest population in the ASEAN countries (India has a larger population for the continent). The total Asian elephant population is less than 10 percent of its more glamorous cousin-the African elephant.

The Myanmar elephant is internationally endangered and is regarded as a worldwide flagship species. Throughout their range states, the wild elephant is severely threatened by habitat destruction, poaching, and fragmentation into small isolated groups. Many population biologists believe that nowhere in Asia is there a single wild population large enough to avoid inbreeding over the long term.

Largely as a result of development, deforestation, (habitat loss) and poaching, wild elephant populations are in decline everywhere in Asia, in some places inexorably. Even worse than the fall in absolute numbers is that populations are becoming splintered, whether as large groups or small-pocketed herds. The inevitable result is increased human-elephant conflict, reproductive isolation, blocked migration routes, poaching, and other threats to their survival.

The downward trend of the Asian elephant population is mainly on account of habitat loss and poaching. In most elephant range countries, loss and fragmentation of habitats, loss of habitat quality, loss of food and water, range degradation and inability of such areas to support existing elephant populations and interventions of cultivation, dams and other developments on the seasonal migration routes of elephants are very common. With the human populations of many

of these areas doubling every 25 years, these problems facing the elephants survival can increase even more rapidly.

The reasons behind the downward population trend for the Myanmar elephant (*Elephas maximus*) a population estimated at under 4,000, according to U Uga are: (l) elephant habitats are shrinking at a faster pace causing habitat fragmentation along with disturbances to elephant ranges and corridors. This results in reduced carrying capacity to hold viable populations in elephant ranges, especially in heavily disturbed pocketed habitats. (2) Serious physical disturbances to elephants and their regular movement are being cut so that smaller groups of four to ten in number are usually observed today (unlike the larger size groups usually observed and documented in the l940s and l950s). This results in the decreased birth rate among wild elephants. In other words, natural selection of favored group sizes and a non-disturbed environment to enjoy successful mating among wild elephants appear to be denied by humans with the consequent birth rate among wild elephants decreasing. (3) On account of poaching for ivory, many herds have become victims of persons holding firearms legally and illegally. Most tuskers are being sought out and killed in elephant range countries, Myanmar is no exception.

Elephants are generalist feeders and consume a large number of plant and tree species as both grazers and browsers. They can consume between 1.5 percent (dry season) to 1.9 percent (wet season) of their body weight in just l2 hours. Asian elephants may spend 70 to 90 percent of their time foraging with two major bouts per 24-hour day. Elephants take in relatively small amounts of feed with each mouthful of approximately l00 to 200 grams of vegetation inserted by their trunks. An adult consumes l50 kg of vegetation (wet weight) per day with an average intake of 7 kg per hour. Given food preferences and needs, grass is always a major component. Elephants also need large quantities of water; an elephant drinks over l00 liters at a time and up to 225 liters in a day.

Consequently, it is important to consider not only daily movements, but also seasonal ranging strategy and habitat utilization between wet and dry seasons. The spatial and temporal distribution of food and water govern the elephant's seasonal movements. Water, though present at high density during early dry periods, begins to be difficult to obtain, forcing elephants to disperse in April-May in search of new sources. Knowledge of home range and migration patterns is crucial for planning nature reserves of adequate size and for managing elephant ranges. In India, home ranges of about l00-300 km^2 should be regarded as minimum size.

An important difference between Asian and African elephants is their ability, to tolerate the sun and to utilize open habitats. Heat dissipation is a problem for both species. Asian elephants need access to shade during much of the day, while African elephants are much less restricted except when with their young calves and have a greater tolerance for drier conditions. Consequently, Asian elephants have greater needs for forest cover. More emphasis is needed to protect ecotones, or the transition between forests and grasslands, to ensure viable habitat for the Asian species.

Male and female African elephants have tusks while female Asian elephants and a large percentage of males do not have tusks. Lacking tusks, both males and females may have an alternate type of modified incisor, or "tushes," that are barely visible beyond the lips. With a

very limited population of male elephants with tusks and with continued poaching, U Uga believes that the loss of magnificent tuskers has a profound emotional impact on people who care about elephants. Because only very limited male elephants bear tusks, the amount of poaching that does occur does not affect the females in the population. However, it does affect the sex ratio and genetic diversity for the population.

Although the habitats of the Asian elephant vary, they are usually ecotones between forest and grasslands and between areas with moderate tree cover grading into grasslands. The degree of interspersion of edges and density and richness of the habitat food patches are important determinants of habitat suitability and thus density. The sites are always in association with permanent water, which is well dispersed in the vegetation mosaic. Asian elephants do not extend into desertic type areas. Populations do occur in dense rain forests only if there is there is sufficient interspersion of water and grass, while secondary or disturbed forests may contain more suitable food plants. Elephants have the ability to move long distances when necessary due to food or water requirements under seasonal migration patterns.

With an area of 676,577 km^2, Myanmar represents the largest country on the Southeast Asian mainland, with the richest biodiversity in terms of potential protection of habitat for elephants and other wildlife. It is claimed that forests, which are essential habitats for elephants, range from 30 percent to 40 percent of Myanmar's territory. Prior to the disruptive and competitive land-use patterns that were imposed on the Myanmar landscape, the elephant enjoyed wide distribution and large numbers.

Today, although the elephant is widely distributed, its range is decreasing. Currently, the protected areas system (only a small percentage contains elephants) is 2.0 percent of the total area of Myanmar with recommendations of extending the coverage of protected areas from 5 percent to 10 percent. Uga and Ye Htut recommended expansion of the protected area network, including managed elephant ranges. Myanmar has already established the first elephant range-Yakhine Yoma Elephant Sanctuary. In long range terms, a network of elephant ranges throughout the country will be established.

There is an urgent need to get reliable census data on elephants in Myanmar. Until now, population estimates made have been based on local information and questionnaire surveys. Scientific elephant census is necessity in estimating population size based on quantitative data. Currently, the Smithsonian Institution is providing some funding and expertise. In the United States, an inexpensive and relatively new method for the census of grizzly bear populations involves the utilization of barbwire to acquire blood samples that are then tested for DNA and individual identification. This method has been highly successful in estimating grizzly bear populations in Glacier National Park wilderness.

Regardless, much of the survival and quality of the wild elephant population in Myanmar, as elsewhere, will depend on the amount and quality of biodiversity throughout the country, especially the forest ecosystems. Biodiversity conservation is not new to Myanmar and dates back to the period of Myanmar Kings. King Bodaw (AD l783-l899) declared Teak as a royal tree (species management) and King Mindon (AD l852-l878) established a wildlife sanctuary (protected area management) at the environs of Mandalay Royal City. Myanmar still posses

fauna and flora of unusual diversity, including the endangered wild elephant. As the natural and national heritage of the country, this biodiversity deserves to be safeguarded for the benefit of present and future generations and for all life.

As noted, Myanmar elephants were formerly distributed widely, but now are confined to forested hill tracks and to the fringes of heavily settled plains. They are considered to be far more common in northern than southern Myanmar. Their habitats are evergreen, semi-evergreen, moist deciduous and bamboo, and sometimes being found in tidal forests. Wild elephants are distributed in l3 States/Divisions with the total area inhabited approximately 115, 600 km^2. However, a study of elephant ranges by the Wildlife Conservation Society reveals only a small portion of these ranges are included in protected areas of national parks or wildlife sanctuaries in Myanmar, which currently cover only 2.02 percent of the country.

In general, adult males are semi-solitary and utilize a given home range for prolonged periods of time. However, shifts in a given home range utilization by males generally accompany shifts in the availability of water and are determined by the length and severity of the drought period. Females and young, including males up to ages of eight to ten years, comprise the majority of the social groupings or "herds" which consist of related adult females and their juvenile offspring who maintain a certain degree of internal organization and who do not associate over long periods of time with other groupings.

The herds are usually lead by an old female who may have produced several generations of young. These herds generally have more flexible and less definite home ranges than the male elephants, i.e., wander more in terms for food, water, cover, etc. Adult females are capable of producing young every 2 and half years. Most wild elephant calves are born between March and May which is the onset of the rainy season. As noted, a large wild population is needed to avoid inbreeding over the long term and this requirement is not met with fragmented, small, isolated groups of elephants due to habitat destruction and poaching. Myanmar is second to India in terms of having the largest population of wild elephant population in the wilds.

Elephants have been playing an indispensable and major role in logging operations for over a century. From an environmental conservation perspective, using elephants (animal skidding of logs) is the least environmental degrading compared to heavy machines in the timber industry. As it is necessary to replenish the stock of timber elephants, some elephants were allowed to be captured every year. Now officially capturing elephants except for research purposes has been banned.

However, after studying case by case, some of the elephants in very serious human-elephant conflict areas, some problem elephants are being allowed to be captured for translocation or domestication, thus, replenishing the stock of timber elephants due to their limited captive breeding. The Ministry of Forestry has laid down great stress in implementing a combined management program that incorporates both wild and domestic elephants populations which provides the best means for ensuring the continued survival of the species.

It is necessary to no longer look at wild and domestic elephants as two distinct populations. The relationship of wild and domestic elephants must be seen as a synergistic or interdependent

relationships and interactions in that the fate of the wild Asian elephant are intrinsically linked to domestic elephants. Timber production, the second largest source of Myanmar's export earnings, is still dependent to a large extent on elephant logging. Tame elephants employed in skidding in selective logging operations eliminate the need to build roads and consequently protect the forest environments of the wild elephant as well as other species. Domesticated elephants, trained to control other animals, are invaluable in relocating wild elephants and in capturing and training them for wildlife management purposes.

From private and governmental sources, e.g., Myanmar timber industry, there are numerous individuals, including veterinarians, who have extensive backgrounds and experience with elephants. This expertise can be utilized in general protection measures for wild elephants. From an elephant husbandry perspective, Myanmar is the jewel in the crown while recognizing that elephants used in timber extraction need improvements in management, health care, and reduced mortality.

For the wild elephants in Asia, poaching is generally widespread with illegal "offtakes"in remote areas. Consequently, habitat conversion, habitat fragmentation and poaching for ivory are prime issues, while wildlife exploitation, capture, and human-elephant conflicts are normal issues. As in other developing countries, deforestation is common in Myanmar, illegal logging and encroachments are common and result in loss and fragmentation of habitats.

As a developing country, Myanmar is no exception in facing issues such as poaching for ivory, meat, skin, ineffective law enforcement, lack of environmental awareness, lack of expertise and trained staff, lack of funds and illegal trade of wildlife and its parts along transboundary areas. Poaching using snares, poisoned spears and arrows, drop spears, guns, pitfalls, hunting dogs, and insecticides are common. There are also news reports of elephants being illegally driven over the border from Myanmar to Thailand. Poaching of adult male elephants for ivory is common. This results in the effective population size being reduced and with the rate of genetic drift increased (more inbreeding). Given the obvious need for country controls of poaching, the following resolution addresses poaching for elephant ivory internationally:

a. With one kg of elephant ivory averaging US$250 in Myanmar to US$435 in Japan and with the bulk of the demand for ivory coming from Japan for manufacturing "hankos" which are signature seal for bank checks and official letters.

b. With the recognition that this demand is a major cause behind the poaching of Asian and African elephants, with particularly severe effects on the Asian elephant population, and since only a limited number of male Asian elephants have tusks.

c. With the increasing loss of habitat and with continued poaching mainly to meet the ivory demand for "hankos," the Asian wild elephant as viable populations, will become extinct in the near future. Many ecologists recognize that nowhere in Asia is there a single wild population that is large enough to avoid in-breeding over the long term.

d. With the termination of the use of the ivory "hanko" in Japan (bone, metal, horn, and other material can and are being used), the poaching of elephants would greatly decrease.

e. Consequently, it is recommended that the International Conservation Community works with the international and national banking organizations and other financial institutions to charge a 5 percent elephant conservation levy on all bank transactions that use ivory hankos in Japan. It is recommended that the above conservation and banking organizations form a special worldwide coalition to implement the above for unity purposes.

In other elephant range countries, human-elephant conflicts are more common and have become big issues. For example, in India, approximately 200 people are killed every year by elephants. However, very few elephants are ever killed because of the sanctity of animal life in the Hindu religion. One rouge elephant has killed as many as 42 people during a week of violent behavior nine years ago.

In the BBC's Subir Bhanmik in Calcutta, October, 200l, wildlife authorities reported at least 11 elephants have died in a forested area in the eastern Indian state of Assam-Sonitpur District (Sonipur is located within the long corridor through which the elephants migrate from Northern Thailand through north Burma and all the way to the foothills of Bhutan). The authorities say the animal deaths may well be the result of farmers poisoning the watering holes used by elephants. Thirty-four elephants are reported to have died of mysterious causes in the state over a two-month period. Due to the ever-increasing growth of human settlements in Assam, particularly in the Sonitpur district, the elephants have been frequently attacking villages, killing people, destroying crops, and flattening houses.

It is anticipated that Myanmar will have serious conflicts between humans and elephants in the near future with gradual expansion of human population and with the gradual depletion of the current forest cover or habitat. Seasonal migration of elephants to low elevation during the dry season, followed by dispersal into the forested hills during rains occur in some areas. However, in certain areas, most of the regular movements have now been checked by a broad intervening band of cultivation, dams, and other developments. Lack of proper land use planning may escalate human-elephant conflicts.

Formerly, Myanmar had no serious human-elephant conflicts. However, more and more serious conflicts are now happening. Human-elephant conflicts have been reported from almost all elephant habitats in Myanmar. The causes for such incidents were due to human population explosion and elephant habitat shrinkage for various developmental activities. Lack of proper land use planning usually leads to unsustainable development and serious conflicts. In most of the localities, crop raiding has been reported to be a major problem and crops such as paddy, banana, sugarcane and others such as mangrove nursery seedlings are damaged by elephants. There are also some cases of recorded human deaths.

Crop raiding by elephants occurs throughout their ranges in Myanmar. In addition to crop raiding, rapid agricultural expansion and infrastructure developments in elephant habitats, heavy extraction of forest products and elephant capture operations were major issues of these conflicts.

From l983 to l996, there were 6 incidents with l6 humans killed. It is worth noting that driving back operations to some extent was successful.

Due to various forthcoming disturbances, e.g., poaching, continued habitat loss and habitat fragmentation with seasonal migration routes being checked and cut, homeless and frightened elephants may go astray to paddy fields, sugar cane fields, banana plantations, and other farmlands, resulting in more human-elephant conflicts in the near future, particularly with increasing human populations and settlements.

The problem of "pocketed" herds is created when elephants, living in development areas, are cut off from adjacent forest tracts, or when a clan or subgroup moves into a project area that was formerly used for foraging. In either case, they establish permanent residence in isolated patches of habitat from which they emerge to forage at night. Observers are surprised at the number of pocketed elephants that live in close proximity to people.

These elephants are extremely dangerous and should be treated accordingly. In similar fashion, in the United States, the most dangerous Grizzly and Black Bears are those bears that live in close proximity to people. These bears often loose their sense of fear for humans with frequent attacks in contrast to the more wild (wilderness) bears that usually have a strong sense of fear associated with any contact of people.

C. CONSERVATION MEASURES

Myanmar elephants were first legally protected under the Elephants Preservation Act of l879 that regulated hunting and capture. It was then protected by the Burma Wildlife Protection Act, l936 (revised in l956) under which hunting was prohibited except by license. According to Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law, l994, elephants have been listed as a "completely protected" species, prohibiting hunting except by license to capture only for scientific purposes.

The exploitation of elephants was controlled further with the establishment of a Kheddah Department in l9l2. Until l994, limited capture operations were permitted and wild elephants were managed in accordance with the Forest Department's Elephant Control Scheme of l935. Internationally, Myanmar joined CITES in l997 and the Convention of Biological Diversity (CBD) in l994. In addition to law enforcement and more effective conservation of wildlife species, including elephants, a nationwide anti-poaching campaign has been recommended.

As noted, the Ministry of Forestry in Myanmar has placed great stress on implementing a combined management program which incorporates both wild and domestic elephants populations as the best means for their survival, and giving priority to both insitu and exsitu conservation of elephants in Myanmar. It was recommended that this program include expansion of the protected areas network, including managed elephant ranges. In long range terms, a network of elephant ranges throughout the country will be established gradually, with the current and first being Yakhine Yoma Elephant Range. With a long-term history of domestic

and wild elephant management, including local authorities, Myanmar has considerable expertise and experience for a combined management program of this nature.

U Uga calls for a decision for the continued survival of Myanmar elephants. The Asian elephant is internationally endangered and is regarded as a worldwide flagship species. The fate of the tiger in Myanmar is at a critical state. U Uga feels that unless appropriate measures are taken urgently, the remnant tigers will be at a point of no return. Likewise, unless appropriate measures for effective management of elephants are taken without delay, elephants will face the same fate of tigers in the very near future.

Besides the recommendation for five new elephant ranges, research programs on the population and ecology of elephants in key elephant areas is needed for long term management. This should not preclude villagers, local official, monks, etc. from observing and making reports on elephant populations, movements, ecology, etc. Some official in a given area could be designated as the elephant compiler with arrangements for collecting records through various channels so that the information would eventually get to a protected area and/or the Nature and Wildlife Conservation Division of the Forest Department for final compilation and study. This process would also involve local people in elephant concerns and conservation.

It is recommended to form permanent anti-poaching units or wildlife squads in key elephant range areas, e.g., Yakhine Yoma Elephant Sanctuary, Alaungdaw Kathapa National Park, and Tamanthi Wildlife Sanctuary, etc. for strict law enforcement and more effective control measures against poaching. It is also recommended to form a technical elephant team/unit directly under the Director-Wildlife Division, to do systematic and efficient management of elephants and to collaborate with international scientific organizations such as the Asian Elephant Specialist Group. It is further recommended to establish equipped mobile anti-poaching units at the central headquarters as well as offers of rewards for information leading to the arrest of offenders in areas where poaching is a serious problem.

Since l996, WildAid has a “Surviving Together” Conservation Project in Alaungdaw Kathapa National Park that is part of an elephant range. Surviving Together is an innovative and collaborative approach to protecting wildlife and wild habitat in Asia that combines science, security, and community outreach. WildAid in cooperation with government and non-governmental partners implements this program in protected areas that typify circumstances throughout Southeast Asia where the level of poaching and illegal logging is high, training and resources for rangers are low, and communities surrounding the parks and sanctuaries are involved in the destruction of their own country’s biodiversity.

The key to success of each Surviving Together project are the following: (a) coordinating the flow of information from separate ranger teams who specialize in patrolling, community outreach, and wildlife monitoring, back to the headquarters where managers can make decisions about how to utilize their limited resources for maximum park protection. Each project is powered by information. (b) Engaging local communities by providing alternative economic opportunities and education that can help them convert from poachers to protectors. On the later objective, A-l slow burning stoves and tree seedlings (to help generate food and income) were provided by WildAid and FREDA to villages around the park as well as meetings with local

schools. Buddhist monks were very cooperative to the project in educating the villagers to develop love and respect for wildlife in the park.

The October and June, 200l WildAid reports indicated a number of wildlife and illegal logging revelations. Among violators, a group of 28 men with 11 elephants presumably intending to log timber was intercepted. No concrete evidence was found to the effect of an actual crime, thus only a warning was issued. In their wildlife monitoring, no wild elephants or their signs were observed. The warden of A.K. National Park has reported that there has not been any elephant poaching in the park for over ten years.

U Uga recommends that extension activities should be undertaken especially near protected areas to get the cooperation of township and village authorities and people in rural areas. He also indicated that appropriate directives from the highest authorities should be directed to persons holding firearms legally, that illegal hunting is not allowed, make it clear that they are not above the law, and invoke their cooperation in its enforcement. Registration of elephants belonging to both the Myanmar Timber Enterprise and private parties were recommended to be completed as soon as possible.

It is recommended to apply more stringent legislation with increased penalties for illegal hunting, collecting and trading of wildlife, and its products while giving utmost weight to endangered flagship species such as elephants and tigers. The latter needs to be taken more seriously endangered than previously anticipated according to team members of the Tiger Project that was conducted by the Forest Department in collaboration with the Wildlife Conservation Society.

Like the Tiger Project, an Elephant Project should be initiated and implemented without delay and with the assistance of international scientific organizations such as the Asian Elephant Specialist Group. Establishment of elephant ranges and habitats, determination of minimum requirements of pocketed populations for their continued survival, assessment of carrying capacity, and the viability of pocketed populations are worthy of consideration in a project of this nature. The Smithsonian Institution has recently started a intensive elephant survey at Alkaungdaw Kathapa National Park.

The recommendations of the Asian Elephant Specialist Group Meeting, Yangon, Myanmar in l997 included: (a) develop a national conservation strategy and species specific action plan for elephants in Myanmar which address the needs of wild and captive species and elephant ranges for long term survival of viable populations; the elephant ranges should be of sufficient size, free from human disturbances, and a legal entity of their own, (b) a uniform system of ex-gratia payments schemes should be developed to mitigate human-elephant conflicts which result in loss of human life, loss of human property, and crop depreciation, (c) the use of power fencing should be demonstrated as pilot project as means of minimizing human-elephant conflict (ivory tusks do not conduct electricity), (d) public awareness campaigns should be launched to highlight conservation issues related to Asian elephants and its impact on human population along with the impact of human activities on elephant habitat.

Human elephant conflicts can sometime be reduced by “driving back” wild elephants into their original habitat or to seasonal migration routes. This is done by a number of private and

governmental persons. However, driving the elephants to new destinations through human settlement is difficult. Tranquilization and translocation is also a common practice in Myanmar but the operational cost is high compared to traditional drive back methods. Traditional stockade methods are also used, particularly for relocating elephants. Capture and domestication of elephants is common in Myanmar and some wild elephants in human-elephant conflict areas may be domesticated to replenish the timber industry.

With human populations expanding and forest cover and habitat shrinking, human-elephant conflicts need increased management that should include buffer zone management, participatory management to mitigate the conflicts, improving socio-economic situations in and around elephant ranges, raising public awareness on conservation issues through educational programs, involving all stakeholders, utilizing accumulated experiences, expertise, and research findings for the sake of the long term survival of the elephant in Myanmar.

U Uga strongly urges that all foresters belonging to the Ministry of Forestry, especially those in the Forest Department and Myanmar Timber Enterprise, as well as involved decision makers at all levels, to try their best, intellectually and emotionally, to see the forests as ecosystems in their decision-making while recognizing both goods and services (including non-economic services) provided by the forests and to pay adequate attention to saving elephant habitats. The concept of forest produce must be considered in a broader biodiversity context.

For Myanmar as well as for other Asian countries with the wild Asian elephant, the loss of forest habitat and poaching are the primary conservation problems and issues for the continued downward trend in population. After dealing with Buddhism and Deep Ecology in general, a consideration of the protection of other living beings, especially elephants, for wildlife protection in terms of poaching and/or killing will be made. Tropical forest protection will follow with attention to Buddhist and public support for natural forest habitat for wild Asian elephants and other wildlife through public support. Therefore, a brief explanation on the need for this type of spiritual approach is presented first.

II. BUDDHISM AND DEEP ECOLOGY

A. NEED FOR SPIRITUALITY

Without unforeseen drastic changes in the next decade, protected areas such as national parks and wildlife sanctuaries may well be the only feasible and permanent way of saving some of the remaining Asian tropical forest/biodiversity, including endangered wildlife like the Asian elephant. However, most of the protected areas in Asia are already under severe depredation due to illegal logging, poaching, and agricultural encroachments. Such destructive practices occur in both Buddhist and non-Buddhist countries. In Buddhist countries in Asia, much of this depredation is associated with nearby villages even where Buddhist monasteries are often nearby.

Current Efforts, such as government programs, foreign aid, community forestry, legislation, NGOs, science and technology, reforestation, and law enforcement are simply not working to halt this irreversible destruction and degradation (legal and illegal) of Asian tropical forests and

their protected areas, to stop the continued loss of endangered species such as the tiger and elephant. Obviously, something much more is needed, along with new ways of relating to forests, protected areas, and wildlife, including the Asian elephant.

Today, there is greater recognition being given to the interrelationships between spiritual beliefs, religious practices of a community, and how that community relates to forest, wildlife, and environment; and to the world in general. As a result, more people are looking at the potential for finding spiritually based solutions to problems that get at the basic causes and values, including ignorance and greed as noted in Buddhism, i.e., deeper solutions.

Human beings are innately spiritual creatures capable of, and drawn to, abstract thought. Spirituality connotes for each of us a diverse, broad, and deep range of relationships that define our underlying sense of identity to ourselves with others, with life, with the earth, with the universe, and with a higher power. These spiritual solutions can include changing values and ways of thinking and behaving from anthropocentric or "people centered" to ecocentric where all living beings are considered to be of value as part of the ecological web of life. Spirituality implies relationships-how one relates to oneself, to others, to one's immediate environment, to the earth, to the universe, and to one's "higher power."

B. BUDDHISM

Buddhism is often summarized as the extinguishing of suffering. It presents an awareness and perception of nature through interrelatedness, "Oneness," loving kindness, and compassion for all living beings. The Dhamma (laws and teaching of nature) and nature orientation of Buddhism has numerous principles and values that are correlated with Deep Ecology.

Buddhism is based on impermanence, that everything is constantly changing, that everything is constantly rising and falling away, and that everything is appearing and disappearing. It also acknowledges that everything that happens (human) depends upon the mind and conditioning. Buddhism focuses on the extinguishing of suffering, which is caused by attachment to anything through ignorance (also includes "ignoring" what is right) and greed (many monks believe greed is really behind illegal logging and poaching).

Buddhism recognizes impermanence in nature, or that everything is constantly changing, or in the process of changing, so that nothing is really worthwhile attaching to in the first place (such as illusions). Thus by detaching, ignorance, greed, aversion, and hence suffering is extinguished.

To stop attachments, Buddhism provides the Eight Fold Noble Path of Right understanding, Right motives or thoughts, Right speech, Right action, Right livelihood, Right effort, Right mindfulness, and Right concentration. Obviously, meditation, with mindfulness and awareness, is very important in this Path and process.

Buddhism is basically Dhamma that has two interrelated areas: (l) the teachings of Buddha, and (2) nature that includes everything, including the laws of nature that apply to all life. Examples of the teachings are compassion and loving kindness that were taught by the Buddha. Thus Buddhism has a respect for all living beings and approaches them with compassion and loving

kindness, such as a reverence for life. The blessings of Buddhist often state, "May all being be happy, May all being be free from their sufferings, May all beings be peaceful and free."

On the Dhamma in nature, Dhamma basically means that we (humans) are simply a part of life along with other beings and that we are included in nature as just another species or living being among other species or living beings. It also means that there are laws in nature like impermanence that operate and apply to nature. Many of these values and laws from Dhamma can be correlated with Deep Ecology.

As a highly respected religion or philosophy in many Asian countries, Buddhism has a great potential for influencing people and their thinking, values, and behavior toward protection of wildlife and tropical forests under Deep Ecology orientations. However, much of this potential has not been developed, nor have many monks, nuns, and lay people been exposed to Deep Ecology orientations per se under the more anthropocentric orientations of some Buddhism. With increasing pressures on wildlife and tropical forests, many Buddhist leaders are bringing forth more Deep Ecology orientations on an intuitive basis from their Buddhist backgrounds as well as through training experiences.

C. DEEP ECOLOGY

Deep Ecology can be considered the spiritual dimensions of the environmental movement. It asks deeper questions that get at the real causes (such as ignorance and greed as noted in Buddhism) behind issues as well as the "place," ethical concerns, ecological limits, and so forth. Deep Ecology recognizes Homo sapiens as a single species in the integrity of the ecosystem or universe, along with all the other numerous species of plants and animals, and their interrelationships.

This deep ecological awareness is basically spiritual in nature; it recognizes that other forms of life (and thus their well being) have intrinsic value and inherent worth, regardless of their "usefulness" for people. It further recognizes that human beings are only one particular strand in the web of life and calls for a paradigm shift from anthropocentric to ecocentric. Deep Ecology and its spirituality call for changing the way people think and act to include these new spiritual and values perspectives. These perspectives would obviously include new attitudes and ways of relating to forests and wildlife, including the Asian elephant.

The following statement is "The Deep Ecology Platform" by Arne Naess and George Sessions, two eco-philosophers:

(1) The well being and flourishing of human and nonhuman life on Earth have value in themselves (synonyms: inherent worth, intrinsic value). These values are independent of the usefulness of the nonhuman world for human purposes.

(2) Richness and diversity of life forms contribute to the realization of these values and are values in themselves.

(3) Humans have no right to reduce this richness and diversity except to satisfy vital needs.

(4) Present human interference with the nonhuman world is excessive, and the situation is rapidly worsening.

(5) The flourishing of human life and cultures is compatible with substantial decrease of the human population. The flourishing of nonhuman life requires such a decrease.

(6) Policies must therefore be changed. The changes in policies affect basic economic, technological structures. The resulting state of affairs will be deeply different from the present.

(7) The ideological change is mainly that of appreciating life quality (dwelling in situations of inherent worth) rather than adhering to an increasingly higher standard of living. There will be profound awareness of the differences between big and small.

(8) Those who prescribe to the following points have an obligation directly or indirectly to participate in attempts to implement the necessary changes.

Both Buddhism and Deep Ecology have an ecocentric, spiritual, and Oneness (holistic) approach. They both define those problems created by ignorance and greed and solve such problems by moving from an anthropocentric orientation to a spiritually based ecocentric approach. Both Buddhism and Deep Ecology are basically concerned with change. They use values and perspectives that are based on spiritual and holistic principles for positive change in paradigms (or worldviews), attitudes, and practices for environmental, tropical forest, and wildlife protection.

Such change is based along clear and realistic lines contained both within Buddhism and Deep Ecology. Both are very similar and can be combined for greater potential and depth in the way that they present a holistic, spiritual, and value-oriented approach to problems such as those presented by tropical forest destruction and degradation as well as wildlife poaching.

Although the "higher power" in Buddhism might be considered Dhamma (nature), Buddhism, with its philosophy and teachings provides a definite way of perceiving the spirituality of relationships, relating directly and indirectly to nature. Deep Ecology often refers to the "Ecological Self" which is spiritually based on relationships and responsibilities for all living beings and nature rather than the ego. Both of these spiritual approaches to nature are based on "Oneness," relationships, all living beings, and ecocentric orientations.

D. WILDLIFE PROTECTION

A Buddhist Monk's Vinaya Rule is: "Should a bhikkhu knowingly kill a living being, it entails a Pacittiya offense." A Buddhist layperson's first precept is "I abstain from destroying or killing life." But not killing or non-violence does not only mean the absence of violence, but the presence of care, good will, of mindfulness, and charity toward all living beings. Gauthama Buddha stated, "Just as with her own life a mother shields from hurt her own, her only child-let all-embracing thoughts for all that lives be thine."

Buddhists affirm that all sentient beings, or living being capable of feelings or perceiving conscious, share the fundamental conditions of birth, suffering, old age, and death. This universality of suffering lies at the core of Buddha's teachings with insight into nature of suffering, its cause and cessation, and the path to the cessation of suffering of the Four Noble Truths.

The Dhammapada states, "Life is dear to all beings-comparing other beings to oneself one should neither hurt nor kill other beings." It is generally recognized that greed is behind poaching and illegal logging which, in turns, involves the first Buddhist precept of not killing as well as the second Buddhist precept of not stealing. Both of these precepts also involve the breaking of governmental and societal laws in poaching and illegal logging acts that, consequently, involve both spiritual as well as secular violations.

As a Buddhist country, Myanmar has emphasis against killing. For example, historical documents reveal that hunters and fishermen associated with killing were given low status or rejection in religious or social affairs. A monk cannot accept alms food if he has knowledge that it involved killing a living being, e.g., chicken, specifically for his meal. As noted, next to human flesh, elephant flesh is not permitted to be eaten by monks due to elephants having noble and ceremonial status and to Buddha's familiarity with them. King Asoka, the model Buddhist ruler, is eulogized for his rejection of animal sacrifice and his protection of animals.

Buddhism links the universality of suffering with compassion. Mindful awareness of the suffering produces compassionate empathy for all forms of life, particularly for sentient species. And this would particularly include the elephant with its huge brain, intelligence, and sensitivity to be aware of suffering. With the recognition that an elephant is born, suffers, gets old, and dies just as humans do, there is an identity and compassion.

The Dhammapada's ethical injunction not to do evil (poach or harm wildlife and other human beings) but to do good as a moral principle advocating the nonviolent alleviation of suffering, an ideal embodied in the prayer of universal loving-kindness that concludes many Buddhist rituals, e.g., "May All Beings Be Free From Their Suffering, May All Beings Be Happy, May All Beings Be Free From Enmity." This would also imply to any measures or support that could be given to elephant protection.

One of the most illustrative influences of Buddhist thought on nature and wildlife protection is the doctrine of rebirth. This doctrine holds that a human being dying can be reborn as an animal or an animal upon dying can be reborn as a human being. This integrates the sense of a shared common condition for all sentient life forms on moral grounds. Thus, it is possible for a human being to be reborn as an elephant and for an elephant to reborn as a human based on moral aspects of their previous lives.

In the Lankavatara Sutra, the Buddha notes, "In the long course of rebirth there is not one among living beings with form who has not been mother, father, brother, sister, son, or daughter, or some other relative. Being connected with the process of taking birth, one is kin to all wild and domestic animals, birds, and beings born from the womb." Thus a poacher killing an elephant could, in essence, be killing a human relative.

From a Buddhist point of view with its laws of cause and effect, the larger the animal one kills, the larger is the bad karma (counter action to the action) accumulated. If one kills an insect, for example, the bad karma accumulated would be very little in contrast to killing an elephant. Similarly, Buddhists feel that they can create merit for their future lives by releasing small animals at ceremonies such as fish, turtles, and birds. Thus the merit would be much greater if Buddhist organized themselves to protect elephants from poaching and other dangers.

In essence, Buddhism is a message of non-violence with elephants often being used as simile in the Buddha's sermons or Dhamma teaching. They were also connected with the Buddha's life and story. In many ways, protecting elephants is protecting the Sasana (dispensation of the Buddhist doctrine) which is the duty of each true follower of Buddha. It is also said that elephants are a symbol for long life and abundance.

Buddhism begins with a reverence for life and its recognition of the interdependence of all life such as "Oneness that involves the universal law of causality: "on the arising of this, that arises; on the cessation of this, that ceases." This integrates all aspects of the general and specific in terms of mutual co-dependence on a cause and effect basis. Common statements on this Oneness from ecology include: "Everything is related to everything else," "You cannot do one thing without effecting other things," "There is no free lunch."

Based on this "Oneness" and its cause and effect, the poaching or killing of just one elephant could have effects on the rest of the herd, including its movements, behavior patterns, and genetic diversity as well as the forest and grasslands ecology. Similarly, the felling of one tree could start a chain of ecological reactions that could degrade elephant habitat and consequent behavior. Although change is inherent in nature, Buddhists believe that the natural processes are directly affected by human morality.

In the Buddhist "Oneness," individuals entities are by their very nature relational, i.e., no autonomous self that is set against the "other," be that human, plant, or animal. Thus Buddhists reject human domination over nature and promote an ethic of compassion that respect biodiversity with its various forms of life. The Thai Monk-Ajahn Buddhadasa Bhikkhu states, "The entire cosmos is a cooperative. The sun, the moon, and the stars live together as a cooperative. The same is true for humans and animals, trees, and the earth. When we realize that the world is mutual, interdependent, cooperative enterprise-then we can build a noble environment. If our lives are not based on this truth, then we perish."

In his Garden of Empowering Liberation, Ajahn Buddhadassa tried to create a place where all forms of life-humans, animals, and plants, live together as a cooperative microcosm of a large ecosystem. The ecological ethic exemplified by this Garden highlight the virtues of restraint, simplicity, loving-kindness, compassion, equanimity, patience, wisdom, nonviolence, and generosity. These virtues represent moral ideals for all members of the Buddhist community-monk, layperson, political leader, ordinary citizen, male, female.

In this regard, there is a sense of responsibility rooted in compassion that lies at the heart of an ecological ethic for Buddhism as well as Deep Ecology. The Dalai Lama states: "The world grows smaller and smaller more and more interdependent...today more than ever before life must

be characterized by a sense of universal responsibility, not only...human but also human to other forms of life."

For many Buddhists, compassion necessarily results from an understanding of all the life forms as mutually interdependent. Others Buddhists believe that a mere recognition of interdependence is necessary, but much more is needed in terms of practice in morality and mindful awareness where one perceives the fundamental interconnectedness of life and a feeling of identification with all life forms. Experienced mediators can readily spot the difference between Monasteries that emphasize meditation and those that do not. The former usually has a more peaceful and harmonious nature.

In reply to how villagers would benefit by protecting the elephant, one monk observed that it may well be how much they can benefit, but how much they would loose in terms of present benefits associated with having wild elephants in forests in there area. The village culture and numerous stories are often based on the interactions of villagers with elephants for rich heritage. With the poaching and/or removal of elephants from the area, the village would not be the same in its traditions and heritage for all generations, i.e., the "wildness, nature contact, or spirit of adventure," would be lost.

Buddhism advocates freedom and being released from one's prison of defilements and conditions. The elephant exemplifies this freedom in the wild, i.e., the spirit and freedom of the wild. Thus it becomes a wild heritage for the villagers as well as in contrast to the domestic elephant which is either working, being directed, or chained. Moreover, ecotourists may be attracted to a village that has wild elephants in the vicinity. Besides opportunities to guide ecotourists, artifacts, gift items, food and lodging could be marketed. However, without the "magic" of wild elephants around due to poaching or removal, the village would loose this source of supplemental and sustainable income.

Another Monk considered that good Buddhists would simply not tolerate the killing of elephants and would make efforts to stop it if at all possible through monks, or through social pressures. Yet, another Monk noted that some poachers are going to poach elephants, regardless of the status of economic benefits in a village- unless the Dhamma reaches their heart and mind. He recognized greed (or craving) as a basic cause behind poaching so it really becomes a spiritual question.

It is interesting to compare that point with a poaching situation in the United States in which a Medical Doctor (high income) was arrested for poaching Grizzly Bears in Yellowstone National Park. He evidently felt that he could make more money by guiding hunters to shoot Grizzly bears in the Park. A rather unique point is that poachers, when "converted, " often make the best-protected area rangers for protecting wildlife. This has been found to be true in both Myanmar and the United States.

As noted, poaching kills and removes the already very limited males with tusks from the already endangered elephant populations that are having serious problems with inbreeding. This is due to their not having a large enough wild population while being in small isolated groups because

of habitat destruction, and fragmentation. Consequently with a loss of genetic diversity (drift), the general reproduction, health, and quality of the entire population suffers. The extinction or diminishment of the wild elephant in a Buddhist country like Myanmar would be severe loss to its culture and society as well as to its religious heritage of Buddhism.

An almost white, eight-year-old wild elephant with tusks was recently captured in Myanmar and is now on display. Since ancient times, as well as during the life of Buddha, rare wild elephants have been recognized as noble and sacred animals that bring high esteem and luck to Myanmar. However, with continued poaching of male elephants with tusks, genes for producing white elephants could very well be removed permanently from the gene pool of Myanmar wild elephants while other Asian countries have very low populations of wild elephants in comparison.

Consequently, every male elephants with tusks that is poached for its ivory is a serious threat to having more white elephants as well as a healthy and adequate population as an endangered species (in danger of extinction-survival unlikely if the causal factors or threats continue to operate) in Myanmar with its Buddhist culture that relates to elephants.

Of strong concern to Buddhism is the fact that the wild male elephants are only poached and killed for greed. One kg of elephant ivory averages $250 in Myanmar and $435 in Japan where it is used to make "hankos," an unnecessary use of ivory when other materials will do- so this too can be considered greed as well as the money motivating force behind the poaching. With the termination of the use of the ivory "hankos," the poaching of wild elephants in Myanmar and other countries would be greatly reduced.

When villagers observe or find out about elephant poaching activities in their area, they have a moral obligation to report the same to a Buddhist monk and/or to an official such as a park or forest ranger. Otherwise, they are indirectly violating the first precept of not killing. For such a large animal like an elephant, the karma for this violation could be quite great in contrast to a much smaller animal. Moreover, by reporting these poaching activities and, hence, protecting the wild elephant, they gain great merit by following Buddha's teachings of compassion and loving kindness for living beings with this merit obviously increased due to the elephant's size and sacred status.

If there is an area where elephants are in serious danger from poachers, one can consider asking monks and nuns to stay and meditate in this locality so that peaceful conditions can be created for the elephants and other wildlife living there. Also, the monk and village headman could consider involving some of the lay people to visit or stay in this type of area in the event that there is not a monastery in the village.

E. FOREST PROTECTION

It is generally recognized that relatively undisturbed, natural tropical forests are essential habitat for the wild Asian elephant, especially under their feeding (diversity), drinking, protection, mobility, and breeding requirements. African elephants, on the other hand, are more tolerant of

water limitations and plains areas so they do not have the same needs for tropical forest habitats as the Asian elephants. Elephant ranges of adequate tropical forests are particularly important for the movements and migrations of the Asian wild elephant. Consequently, protection measures for the Asian elephant must be correlated with protection of tropical forests and their issues and values as well as how Buddhism and Deep Ecology apply to these measures.

The enormous variety of life forms in tropical forests creates a powerful spiritual environment, endlessly different and suspenseful as the most mysterious of all natural worlds. This spiritual response obviously has significant impact on virtually all human beings, regardless of their religious, social, and cultural background. This response and impact of tropical forests were experienced and noted by the Buddha.

More than 2,500 years ago, the Gauthama Buddha was born in a forest. As a youth he meditated under Jambo trees, studied among the Banyans, and found enlightenment beneath a great Boddhi tree. A denizen of the woods for the next 45 years, he died beneath a pair of Sal trees among his disciples. Buddhism originated and was developed in the company and protection of the great life form-the tropical forest. Thus Buddhist teachings gave rise to an ecological ethic with strong concern for nature and the forest. They emphasize the importance of coexisting with nature rather than conquering it.

Protection of all life is a Buddhist tenant. A monk's first vow is, "I abstain from destroying life." Although sentient beings, or living beings capable of feeling or perceiving consciousness, are most often associated with the animal kingdom, some Buddhist include the plant kingdom when referring to sentient beings. Thompkin's The Secret Life of Plants, and some recent plant research, certainly suggests that plant life may respond with "feelings."

The Buddha taught that all sentient beings might attain nirvana, the cessation of suffering and the liberation from the wheel of birth and death. Mahayana, a radical reformation movement in Buddhism around the beginning of the Christian era, opened and stressed the possibility of liberation to greater numbers of beings with some Mahayana Buddhist, including trees. In the Gaia view (the earth as a living organism), the earth itself is considered a sentient being and this view would certainly include its tropical forests which some consider to be the "lungs" of planet earth (about 7 percent).

Tropical forests are the richest and most diverse expressions of life that has evolved on earth. They are complex and fragile ecosystems with webs of interlocking, interdependent relationships between diverse plant and animal species and their nonliving environment. Tropical forests approximate the primeval forest biomes from which they originally evolved, and contain more than half of worlds estimated 10 to l00 million species of plants and animals. Worldwide, approximately, l.5 million species are presently recorded.

Irreversibly, tropical forests are literally disappearing within our lifetimes. Most tropical forests are too complex and their species too diverse to regenerate themselves from present destructive patterns or to be managed on a sustained yield basis. Thus, tropical forest destruction must be considered permanent and irreversible along with its loss and impact on essential habitat for the Asian elephant. In Thailand, a number of Buddhist monks and nuns have made various efforts

to protect tropical forests. These efforts include ordaining trees in tropical forests by placing Monks' robes around them to discourage illegal logging.

By maintaining intact tropical forests in a close to natural conditions as possible, they can make immense diverse, productive, valuable, and intangible contributions to all life, including humans and elephants, on a long term basis. Present and future protected areas of natural or near natural tropical forests in national parks, wildlife sanctuaries, and elephant ranges may well be the only feasible and permanent way of saving some of the remaining tropical forests and their rich biodiversity, including elephants. Many protected areas, however, are currently undergoing severe degradation and poaching to the extent that their ecological integrity may be in serious jeopardy. These destructive activities would certainly preclude having adequate habitat for the Asian wild elephant.

The major problem for tropical forest destruction appears to be overpopulation of humans with current populations over 6 billion and a predicted increase to over l2 billion people by 2050. This problem is particularly severe in tropical forest countries where populations double every 25 years. This will greatly increase exploitation for the remaining tropical forests, including those in protected areas. The third Buddhist precept is: "I undertake the training to refrain from sexual misconduct." The third precept would reasonably include birth control measures to limit the size of families.

Worldwide, recognition is growing that, in addition to conservation and protection efforts for tropical forest countries, tropical forest destruction is an urgent global problem that requires international action and assistance. In addition, greater awareness of values of tropical forests is required by the public, thought leaders, spiritual leaders, and political/administrative decision-makers. It is vital to address not only the destruction of tropical forests, but the values and reasons why the oldest, richest, most complex, and productive ecosystems of the world should not be destroyed. Many of these values pertain directly and indirectly to Buddhism and Deep Ecology.

Values are individual and collective concepts with emotional, judgmental, and symbolic components that we use to determine what is important, worthwhile, and desirable. Thus, values contain, and at the same time evolve from judgments and beliefs about what is "good" or "bad" and "right" or "wrong." Values, therefore, can significantly influence human behavior regarding the protection or destruction of tropical forests and their elephant populations.

By their very nature, values are complex in both interpretation and influence. This is particularly true in regard to tropical forests that involve both anthropocentric (human centered) and ecocentric (ecology centered) values. The tangible and, especially, the intangible values of tropical forests are difficult and sometimes too impossible to define and formulate, let alone to quantify.

Some of these values may include biological diversity, genetic diversity, species diversity, agricultural (genetic materials), medicinal, industrial, tropical forest people, maintenance of the web of life, climatic, water conservation, wildlife conservation, soil protection, outdoor recreation, education, ecotourism, creativity, spirituality, cultural, and future generations. There

are numerous high-value interrelationships within intact and natural tropical forests that are as yet minimally undisturbed by development and other encroachments. This is particularly true of intangible values associated with spiritual aspects of Buddhism and Deep Ecology in terms of the protection of the Asian wild elephant.

With its settings of stunning natural beauty, free from the pressures of civilization, tropical forests provide undisturbed solitude and tranquility where Buddhist monks, nuns, and lay people can feel closer to Dhamma or nature and its many dynamic aspects of spirituality. These experiences, particularly through Buddhism meditation, provide the realization of one's role, niche, or place in the natural scheme of the forest, the planet, and the universe. Besides monastic lives in forest pagodas, many Buddhist monks, nuns, and lay people go on extended walks alone or in groups to fully experience tropical forests and the forests' rich relationship to Buddhism.

In their lives in tropical forests, Buddhist are exposed to and educated by the surrounding nature or Dhamma. For example, a Buddhist monk from Thailand, Phra Prachak, said that he could observe impermanence or constant change, as well as other laws of nature of Dhamma in the forest, by observing young trees, middle aged trees, dying trees, and dead trees. He could also observe Dhamma through young, middle aged, and dying leaves on a single tree, with the leaves rising and falling away.

With the interacting of tropical forests and Dhamma principles of nature, many Buddhists find that they are able to find a sense of "Oneness" with surrounding nature and to recognize their interrelationships and interdependencies with everything they encounter. Much of this comes by simply living in the forests and meditating so that one loses their sense of separation and self and gain a sense of "Oneness" and interconnectedness that is transforming on a spiritual as well as on a physical and mental basis. This transforming provides a spiritual philosophy of the environment or Deep Ecology, which recognizes the sacredness of the tropical forests and the humble role of human beings in them as well as the need to reverse the harm that is being done to them and the wildlife, including elephants, that they contain.

Wherever Buddhism has been influential in a country or culture, there has usually been some direct or indirect benefits for nature, wildlife, and tropical forests. In Buddhist literature, there are 21 tree species under which 25 Buddhas attained enlightenment with veneration and protection of these species as a natural consequence of this belief. In Sri Lanka, Buddhism has had the largest single impact on the protection of flora and fauna, with conservation measures beginning in the third century. Sacred forest groves have traditionally surrounded temples or shrines in this country as far back as 200 A.D. These temple forests are, in many areas, also the last refuges of biodiversity.

However, formal government measures for nature and tropical forest protection require acceptance by the people based on their deep value convictions. Without this support, many government programs cannot be successful. Reports on protected areas in tropical forest countries reveal large amounts of illegal logging and poaching. In Thailand, Buddhist forest monks, with their strong concerns for nature, are the strongest voices for protection of tropical forests and their wildlife, including elephants.

There are approximately 700 Buddhist forest monasteries in Thailand. These Monasteries are often located in the last remaining forested lands in their areas where they have a strong and mutual sense of concern and interrelatedness with local populations. Some are located in close proximity to national parks and wildlife sanctuaries. Without the influences of these wats or pagodas over the past century, there would be little forest remaining in many of these areas, not to mention the needed support for the nearby protected areas of tropical forests and wildlife.

In the Rukkha Sutta, the Buddha admired those who sat at the foot of the trees, who desired seclusion, and who had few needs. These teachings encourage his disciples to lead a forest life and prevented them destroying the forest. The Buddhist communities were primarily comprised of forest-dwellers, so these members had to be mindful for protection of the forest, which was basically their abode. Community members had to respect each tree with which they came into contact. The Buddha chose to live in the forest in order to imitate what he saw. He emphasized the value of living in the forest to his disciples and called on newly ordained monks to sit at the foot of a tree.

A famous Buddhist story tells how a monk, while making repairs on his hut, cut down a tree that was the abode of a Davida (god). Although the Davida urged him not to cut down the tree, " to make an abode for yourself," the monk went ahead anyway. In so doing, he struck off the arm of the Davida's son. When the Buddha learned of this incident, he laid down a rule that forbade community members to destroy any tree or plant growth. The story of the Davida portrays cutting down a tree as a selfish act. It disturbs the peace of others and deprives the wildlife such as elephants of their habitat. It is also considered an ungrateful act since the monks depend on the trees in their forest dwelling.

As a royal ruler of a Buddhist country-Thailand, H.H. King Bhumibol Adulyade made the following pronouncement on forest protection: "In order to make the forest flourish, it is not necessary to plant one more tree. What is more important is to let the trees that are there grow of themselves and not to interfere with them. Just to protect them and not to harm them is enough." Buddhist monks have pledged to ordain numerous trees and to create an awareness of forests and their needs for protection. The ordination ceremonies involve placing orange robes on tree as part of their ordinations so that they could be perceived as "Ordained Monks," a practice that is followed through much of Thailand by Buddhist Monks and communities in efforts to protect tropical forests. And a practice which is now starting to spread to other Asian countries.

In and around protected areas, it is not uncommon to see occasional Buddhist monks who have located themselves in simple camps. These monks, along with those from nearby wats or pagodas, generally have a good influence for protection over these areas with the nearby villages as well as with government officials. The monks often counsel and advise officials and villagers on spiritual matters that might affect the protected areas and wildlife.

It is a custom among some protected area staff to practice Buddhist meditation in the early mornings before proceeding with the business of the day. Superintendents have noted that this practice clears the minds of protected area staff and encourages them to make greater moral efforts for protection of the forest and wildlife. Buddhism is also incorporated into training

programs for protected area staff and there is usually a small temple and/or Buddha image available at the headquarters.

Buddhism provides the foundation of the philosophy and religion for the cultures of Asian countries as well as a strong basis for reverence for all forms of life and protection of tropical forests and wildlife. Buddhist temples or pagodas can provide environmental education to local populations near protected areas as well as serve as a bridge for public participation with government agencies. Buddhist monks, nuns, and lay people can provide leadership and inspiration for bringing spiritually based ecological and biodiversity values of natural tropical forests to the public for their active participation.

In this sense, Buddhism can serve as an environmental educator for tropical forests as well as a spiritual mechanism for influencing the values and behavior of the public, government, and private institutions toward protection measures for the tropical forest and wildlife. It has the potential and ways, particularly with Deep Ecology, to provide spiritual paradigms and solutions to problems and issues that involve moral and value considerations for tropical forest protection. For, example, the third precept of Buddhism forbids stealing. This would certain apply to illegal logging practices which basically involve stealing logs from the forest.

Tropical forests are intimately related to the cultures of tropical people through diverse influences on the entire range of knowledge, traditions, and values of the cultures and nations involved. Asian Buddhism is very much related to the unique interface between people, tropical forests, and wildlife found in countries like Myanmar, Thailand, Laos, Cambodia, Vietnam, and Sri Lanka. The institution of Buddhist monasteries or pagodas are especially a part of this unique interface with the need for the proximity of natural tropical forests which need protection from continuous development and destruction.

Damage to and loss of natural tropical forests also results in a loss of significant cultural values and institutions, including life styles associated with Buddhism, forests, and wildlife. The impacts of deforestation extend a rippling effect throughout entire cultures, removing and eroding authentic and traditional characteristics, values, and life styles. The natural heritage of native plants and animals, the undisturbed landscape, and the cultural identity associated with natural tropical forests disappears forever. No reforestation, tree planting, agroforestry, or sustainable forestry projects can replace these natural tropical forests and their values for a given culture.

Tropical Asian countries and people lose much of their cultural and natural identity without their tropical forests. This would certainly include the wild Asian elephant as well as many of the tangible and intangible values associated with Buddhism. The protection of tropical forests through Buddhism and Deep Ecology, consequently, also extends to the protection of the unique and traditional Buddhism associated with a given tropical forest country and its culture. The values of tropical forests are the very essence of life itself.

Concerns and responsibilities for natural tropical forests must extend to the future as well as for present generations because these threatened ecosystems are highly susceptible to irreversible removal or very serious and damaging reductions with resulting loss of spiritual, cultural,

biodiversity, and other values and options for survival and quality of all life, including the Asian elephant.

Buddhism and Deep Ecology recognize the moral and value obligation and responsibility to protect tropical forests for future generations of all species, plant and animal, known and unknown. They are concerned with the essential protection of natural tropical forests for their own sake for the future on an ecocentric rather than an anthropocentric basis.

Future generations of all forms of life, especially Asian elephants, require that tropical forests be protected in an intact and natural state, Humankind, including the Buddhist communities, need tropical forests for their tangible and intangible values. Tropical forests could survive quite well without human presence and impacts. Yet it is only within intact, natural tropical forests environments that diverse and interdependent forest species, such as the Asian elephant, can carry on their struggle for survival.

Hence the need to protect the ecological integrity of current protected areas of tropical forests, including elephant ranges, and to establish and maintain new ones in Asia. It is essential that present and future generations of all life have natural tropical forests for their survival and quality. Buddhism, particularly under Deep Ecology orientations, has very important roles to play in the protection process for the remaining natural tropical forests in Asia before it is too late for tropical forests or the Asian wild elephant which depends upon these forests for its very life and future.

III. DHAMMA/ECOLOGY GLOSSARY

ACCULTURATION: The processes and results of external change imposed on a human population with loss, or degrees of loss, of traditional social and cultural->VALUES and institutions.

adhitthana: Pali = strong determination (->parami).

AEROBIC: Life or process that depend on the presence of oxygen. (->ANAEROBIC)

AESTHETICS: Considerations, values, and judgements pertaining to the quality of the human perceptual experience (including sight, sound, smell, touch, taste and movement) evoked by phenomena or components of the environment (Buddhist->ayatana).

ahimsa: nonviolence, peaceful attitude towards all beings, part of first precept of not-killing (->pancha sila;->sila).

ANAEROBIC: Life or processes that occur without free oxygen or in absence of air (->AEROBIC).

anapanasati: mindfulness of breath, meditation teaching from satipatthana sutta.

anatta: Pali, no-self, teaching that all manifestation of mind and matter is void of any permanent self or soul, one of the three characteristics of existence (->anicca,->dukkha)

anicca: Pali, impermanence, one of the three characteristics of existence, (->anatta,->dukkha)

ANTHROPOCENTRIC: A view conceiving of everything in the environment/ universe in terms of human values, ends, or aims without recognition or consideration of other forms (plant or animal) of life or responsibilities thereof. Interpreting reality (environment) exclusively in terms of human values, interests, and experiences (->ECOCENTRIC).

ANTIBIOSIS: The process during which the growth of one species of organism inhibits another (->SYMBIOSIS).

AQUATIC LIFE: Growing or living in or frequenting water (plants and animals.

arahat: lit. “worthy one”, one who has realized the highest truth and destroyed all his mental impurities.

ASSOCIATION: All organisms occupying a given habitat (->COMMUNITY).
AUTOPOIETIC: self-creating or self-generating, i.e. something which brings itself into existence.

avijja: Pali = ignorance, delusion, being the cause of the chain of dependent origination (->paticca samuppada), one of three principal mental defilements (->dosa,->raga)

ayatana: Pali, 'sphere'. The six spheres of perception and their corresponding objects: (1) eye and visible form; (2) ear and sound; (3) nose and odor; (4) tongue and taste; (5) body and tangible things; (6) mind and mind objects (->AESTHETICS).

BASIC NEEDS: Necessities required for satisfactory human existence, such as food, shelter, clothing, good health, education and creative employment (->QUALITY OF LIFE).

bhavana: Pali, mental development, meditation (bhavana-maya panna: wisdom as a result from direct experience)(->samadhi).

bhikkhu: Pali, Buddhist monk (bhikkhuni: nun)(->sangha).

BIOCENOSIS: A loosely defined group of interacting organisms occupying the same habitat and utilizing the same resources.

BIODIVERSITY: The biological complexity of species of organisms of an->ECOSYSTEM, the numbers of species in a community or region. In many instances, the ecosystem becomes more stable as diversity increases.

BIOMASS: The amount of living matter in the->ENVIRONMENT. It is usually expressed as the weight per unit area.

BIOME: The complex of communities maintained by the climate of the region and characterized by a distinctive type of vegetation. A major biotic community composed of all the plants and animals and smaller biotic communities, including the successive stages of the area (->BIOREGION).

BIOREGION: a particular area of natural environment with its characteristic plant, animal or human life, i.e. forests, lakes, mountains etc. (->BIOME).

BIOSPHERE: The portion of the earth and its atmosphere capable of supporting life. The thin covering of the planet that contains and sustains, extending from up to 6,000 m above to 10,000 m below sea level.

BIOSPHERE RESERVES: Protected land, water, and/or coastal environments that, together, constitute a world-wide network of scientific information and include significant examples of natural->BIOMES and/or unique, representative biological areas throughout the world.

BIOTA: All living organisms, both plant and animal, that exist within a given area or period.

BIOTIC POTENTIAL: The inherent capacity of an organism to reproduce and survive, which is pitted against limiting influences of the environment.

BIOTOPE: The smallest geographical unit of a habitat, characterized by a high degree of uniformity in the environment and its plant and animal life; e.g., a decaying stump.

BIOTYPE: A small geographical unit occupied by a community of plants and/or animals and characterized by a high degree of uniformity.

bodhi: Pali = enlightenment (->bodhisatta). 'Ficus religiosa', the Bodhi Tree, a tropical tree under which Buddha reached enlightenment.

bodhisatta: one who has tasted the spirit of enlightenment but has vowed not to leave the cycle of rebirth before with his help all other beings have reached enlightenment as well.

Buddha: Pali., the awakened one; title given to a person who has found the path of enlightenment, has practices accordingly and realized the highest goal through his own efforts.

BUFFER ZONE: A designated land or water area along the edge of some land (often nature or other reserves) use, whose own use is regulated so as to absorb, or otherwise preclude unwanted development or other intrusions into areas beyond the buffer.

CARNIVORE: An animal that feeds chiefly on other animals (->HERBIVORE).

CARRYING CAPACITY: The maximum number of living things that can be supported indefinitely by a given->ECOSYSTEM or area without deterioration. The limit as to the number of individuals of any one species that can be maintained in a particular->ENVIRONMENT during the "pinch" period (dry, winter, etc.) of the year.

CASE STUDY: Deal with a problem or situation that has existed or that now exists in an organizational context. The problem or situation typically involves a decision that needs to be made or has been made. Case studies require analysis and offer opportunities and participation for learning from another's experiences as well as developing generalizations and understandings for other situations/problems.

CASUAL SPECIES: Species that occur rarely or without regularity in a given community.

CHLOROPHYLL: Green pigment found in algae and higher plants, located in chloroplasts, which capture light->ENERGY and enable plants to maintain->PHOTOSYNTHESIS.

CITES: Convention on International Trade in->ENDANGERED Species of wild plants and animals. Composed of various nations and has a regulatory network to control trade of endangered species on a worldwide basis.

citta: Pali, mind.

CLASSIFICATION: Biological classification is based mainly on structural criteria and arranges organisms in a hierarchy of groups; species; genus, family, order, class, subphylum, phylum, subkingdom, kingdom.

CLIMATE: Long-term weather conditions and factors peculiar to a given environmental segment/area due to its geographical situation. One of the major factors that determines the distribution of plant and animal species on the earth.

CLIMATIC STRESS: At the level of exchange between the organism and the—>ENVIRONMENT a geographic boundary will establish at which the stress cannot be overcome by an organism.

COMMUNITY: All the plants and animals in a particular habitat that are bound together by food chains and other interactions that are self-perpetuating.

COMMUNITY/CLIMAX: A relatively stable, biotic community that appears to perpetuate itself in the absence of disturbance. The final, culminating stage of ecological succession for a given environment.

COMPETITION: An interaction involving two or more organisms trying to gain control of a limited resource/factor. Potentially may have negative impact on the less effective organism in the rivalry. Competition may be interspecific (exist between different species) or intraspecific (exist between individuals of the same species).

CONSERVATION: Management of the->BIOSPHERE so that it may yield the greatest sustainable benefits to present generations while maintaining its potential to meet the needs and aspirations of future generations.

CONSERVATION/LIVING RESOURCES: Processes to: (a) maintain essential ecological processes and life support systems, (b) preserve genetic diversity (range of genetic material found in world's species), and (c) to ensure the sustainable utilization of species and->ECOSYSTEMS.

CONSERVATION OF MATTER: The principle that matter is neither created nor destroyed during any physical or chemical change (->CONSERVATION).

CONSUMERISM: One of the major factors for exploitation of natural resources and environmental pollution. Industries produce cheap mass products of poor quality or limited use to encourage future purchases of these throw away products.

CONSUMERS: Organisms of a food chain that feed upon other organisms. Usually classified as primary consumers
(->HERBIVORES—plant eating), secondary consumers
(->CARNIVORES—animal eating) and micro consumers (microorganisms—decomposers).

COORDINATED APPROACH: Effective communications and "working together" of various organizations, groups, individuals, and disciplines on a cross sectional basis toward environmental goals and problems. A coordinated approach (and arrangements) bridges the gap, deals with neglected areas, reduces conflicts, and avoids duplications.

COSMOS: The universe considered as a harmonious and orderly system.

COUNCIL OF BEINGS: Creative and imaginative environmental education exercise, where the participants associate with a particular non-human being and speak out for its rights, aiming at raising people's consciousness towards the interconnectedness with all beings and the latter's inherent right for their own struggle for survival without human interference (->DEEP ECOLOGY,->interbeing).

COVER: Plants and/or other objects used by animals for feeding, raising of young, and protection from->PREDATORS and adverse environmental conditions.

CULTURE: The complex whole of knowledge, achievements, technology, traditions, perceptions, customs, values, habits, and other capabilities of society and human inherited traditions and patterns. Culture influences societal/individual behavior and its environmental relationships.

CULTURAL ECOLOGY: Study of human relationship to the->ENVIRONMENT, including the adaptation of culture to the habitat.

CULTURAL RESOURCE: Any building, site, district, structure, or object significant in history, architecture, archeology, culture, or science.

dana: Pali = charity, generosity, donation

DECIDUOUS: Falling off at an end of a growing period (season) or at maturity, as some leaves, antlers, insect wings etc. Commonly used term to distinguish trees that shed their leaves as opposed to evergreens that retain their leaves.

DECOMPOSERS: Organisms, usually fungi or bacteria, which use dead plants/animals as sources of food by breaking them down and releasing minerals and nutrients.

DEEP ECOLOGY: Ecological approach which correlates with a deep spiritual and value(s) understanding of nature, endowing equal rights to all living beings;->ECOCENTRIC (as opposed to->ANTHROPOCENTRIC) view, which relates to the Buddhist concept of ->interbeing.

DEFAUNATION: Destruction of animals in terrestrial->ECOSYSTEMS; elimination of life in aquatic systems.

DEFORESTATION: Permanent removal of forest and its undergrowth to transfer area into other uses.

DENSITY: (1) Number of a given species per unit area and time, (2) The ratio of the weight of an object to its volume, e.g. density of wood.

DESERTIFICATION: The gradual destruction or reduction of the capacity of drylands (low rainfall with high evaporations) for plant and animal production due to the inherent vulnerability of the land and to the pressure of human activities, e.g., overgrazing, deforestation, poor soil management, etc.

DESPAIRWORK: Developed by Joanna Macy, based on the experience, that facing the environmental crisis leaves many concerned people in feelings of apathy, hopelessness and despair. Despairwork aims at confronting, accepting and transforming such emotions into hope and active care in the field of environmental protection (->DEEP ECOLOGY,->COUNCIL OF BEINGS,->EVOLUTIONARY REMEMBERING).

DEVELOPMENT: The modification of the->BIOSPHERE through the application of human, financial, living, and non-living resources to satisfy human needs and to improve the quality of life.

DEVELOPMENT/SUSTAINABLE: Integrates->DEVELOPMENT and conservation of living resources. Sustainable development comprehensively takes into consideration social, ecological, and economic factors, the living and non-living resource base as well as short and long term advantages and disadvantages of alternative actions.

dhamma: Pali, nature, the law of nature, the truth, the teaching of the Buddha.(Sanskrit: *dharma*)

dhatu: Pali, element, the four elements are: earth (weight), water (cohesion), fire (temperature), air (motion).

DIVERSITY: The number of species per unit area or volume. Areas of high diversity are characterized by high numbers of species, e.g.,->TROPICAL FOREST.

DIURNAL: Occurring every day, generally in daylight. Diurnal animals are generally active only during the daylight hours.

dosa: Pali, aversion, one of three principal mental defilements (->avijja,->raga).

dukkha: Pali, unsatisfactoriness, suffering, one of the three characteristics of existence (->anicca,->anatta).

ECOCENTRIC: Understanding that puts nature as a whole into the center of our experience (>ANTHROPOCENTRIC;->DEEP ECOLOGY)

ECOCIDE: Used in the destruction of the->ENVIRONMENT,->ECOSYSTEMS, etc. by pollutants or defoliants; e.g., in Vietnam.

ECOLOGICAL BACKLASH: Unexpected and often undesirable, side effects of human actions and changes on an->ECOSYSTEM.

ECOLOGICAL BALANCE: The state of dynamic equilibrium of an

->ECOSYSTEM of biotic community whereby the species/populations comprising it tend to fluctuate or maintain their numbers within limits and without extinction.

ECOLOGICAL FACTOR: An environmental factor that under some definite conditions, can exert appreciable influence on organisms or their communities, causing the increase or decrease in the number of organisms and/or changes in the communities.

ECOLOGICAL IMPACT: The total effect of an environmental change, either natural or human caused on the ecology of an area.

ECOLOGICAL INDICATORS: Factors, organisms, species, and communities with specific characteristics that can be used for the determination of certain environmental conditions.

ECOLOGICAL NICHE: The role, status, and position of a species in the->ENVIRONMENT, its activities and relationships to the biotic and abiotic environment. Also refers to specific places and functions where individual organisms can live.

ECOLOGICAL SUCCESSION: The gradual and progressive sequence of communities and organisms that replace each other in a given place. The changes, over time, in the structure and function of an->ECOSYSTEM with the replacement of one kind of->COMMUNITY of organisms with a different one. Primary succession occurs on sites with no previous vegetation while secondary succession occurs on sites that supported vegetation previously.

ECOLOGY: The branch of biological science that studies the relationships of living organisms with each other and with their environment (->DEEP ECOLOGY).

ECONOMICS: The study of how humans allocate scarce, productive resources in the production of different commodities over time and how these commodities are distributed for consumption between time periods and among members of a society.

ECOSPHERE: The layer of earth and surface air inhabited by or suitable for the existence of living organisms. Also, the conception characterizing the earth's->BIOSPHERE as a unified and global->ECOSPHERE.

ECOSYSTEM: A natural complex or functional unit of living organisms and the abiotic environment interacting to form a stable and self-sustaining system with the exchange of materials and energy.

ECOTONE: A boundary and/or transition area (zone) between two or more communities. Commonly contains some of the organisms of overlapping communities besides those organisms characteristic of the ecotone.

ECOTYPE: A genetically specified subpopulation that is restricted to a certain habitat.

EDAPHIC: The chemical, physical, or biological characteristics of a given water and soil environment that influence organisms.

ENDANGERED: Generally taken to mean any species or subspecies of an organism whose immediate survival is threatened with->EXTINCTION if the casual factors (threats) continue.

ENDEMIC: A species restricted to a given geographical location. Native species to a given locate.

ENERGY: The capacity to do work or transfer heat. Energy may take a number of forms, among them mechanical, chemical, and radiant, and can be transferred from one form to another.

ENERGY FLOW: The one way passage (transfer) of->ENERGY through an->ECOSYSTEM, including the way in which energy is converted and used at each trophic (food) level on an ecosystem.

ENERGY PYRAMID: Because so much->ENERGY is lost as heat (80 to 90 percent) in each transfer at each trophic level of an->ECOSYSTEM, the shape of the energy flow is in pyramid form. The conventional distribution of the biomass of an ecosystem tends to conform to the energy pyramid.

Engaged Buddhism: The application of Buddhist philosophy in environmental, social, political and cultural issues.

ENVIRONMENT: The aggregate of surrounding things (biotic and abiotic) and conditions that influence the life of an individual organism or population, including humans. The sum of all external things (living and non-living), conditions, and influences that affect the development and, ultimately, the survival of an organism.(->BIODIVERSITY)

ENVIRONMENTAL ADMINISTRATION: The process of directing and managing public policies and activities in environmental affairs under broad, governmental guidelines which protect and promote the public interest. It is basically concerned with the management of the relationships of people, society, and development to living resources/environment on a holistic basis and involves->VALUES and->VALUE JUDGMENTS in the policy/decision-making processes under comprehensive and interdisciplinary orientations.

ENVIRONMENTAL ATTITUDE: A state of mind or feeling that represents a behavioral predisposition toward a given environmental object. Attitudes are produced by groups of beliefs that collectively cluster around given objects/environments, e.g., attitudes of concern, apathy, etc.

ENVIRONMENTAL AWARENESS: The growth and development of awareness, understanding, and consciousness toward the biophysical environment and its problems, including human interactions and effects. Thinking "ecologically" or in terms of an ecological consciousness.

ENVIRONMENTAL DEGRADATION: Any action that makes the environment less fit for human, plant or animal life. Also associated with the lowering and reduction of environmental quality.

ENVIRONMENTAL EDUCATION: The educational process that deals with human interrelationships with the->ENVIRONMENT and that utilizes an interdisciplinary, problem-solving approach with->VALUE CLARIFICATION. Concerned with education progress of knowledge, understanding, attitudes, skills, and commitment for environmental problems and considerations. The need for environmental education is continuous because each new generation needs to learn->CONSERVATION for itself.

ENVIRONMENTAL EDUCATION, GOALS: Directed at developing a world population that is aware of, and concerned about, the total environment, and its associated problems, and which has the knowledge, understanding, attitudes, skills and commitment to work individually and collectively toward the solution of current problems and prevention of new ones.

ENVIRONMENTAL ETHIC: An ecological conscience or moral that reflects a commitment and responsibility toward the->ENVIRONMENT, including plants and animals as well as present and future generations of people. Oriented toward human societies living in harmony with the natural world on which they depend for survival and well being.

ENVIRONMENTAL IMPACT ASSESSMENT: An activity designed to identify, predict, interpret and communicate information about the effects of an action and to ensure ecological and sociological information is included with physical and economic information as the basis for making decisions.

ENVIRONMENTAL INDICATORS: Characteristics and factors for determining present and future conditions of the environment.

ENVIRONMENTAL PERCEPTION: Consciousness, understanding, and awareness of elements, interrelationships, and problems of the->ENVIRONMENT through sensory knowledge and judgment (for Buddhist concept of perception and the elements see->khandha;->dhatu;->kalapa).

ENVIRONMENTAL PROBLEMS: Largely result from the interaction between humanity, culture, technology, and the biophysical environment (e.g., ->POLLUTION, land abuse, etc.) and are caused by a complex set of biological, physical, and social factors which affect the total->ENVIRONMENT, including the survival and quality of life.

ENVIRONMENTAL PROTECTION: Measures and controls to prevent damage and degradation of the->ENVIRONMENT, including the sustainability of its living resources. To protect the environment from negative or destructive effects, influences, and consequences.

ENVIRONMENTAL QUALITY: The degree or quality related to the condition of the—>ENVIRONMENT that allows humans to physically utilize resources and obtain amenity values from their surroundings. The sum total, harmony, and evaluations of environmental factors and forces that influence human work, living conditions, communities, and leisure. Absence of negative or destructive effects and influences in a given environment.

ERODE: To wear away or remove the land surface by wind, water, or other agents.

EROSION: The wearing away of the land surface/soil by water or wind. Erosion occurs naturally from weather or runoff, but is often intensified by land clearing or disruption.

ESTHETICS: Pertains to the beautiful or pleasing. Is generally an emotional judgment of that perceived.

EVERGREEN: A tree or shrub that has green leaves throughout the year.

EVOLUTION: The biological theory or process whereby species of plants and animals change with the passage of time so that their descendants differ from their ancestors, i.e., development from earlier forms by hereditary transmission of slight variations in successive generations.

EVOLUTIONARY REMEMBERING: Common contemplative exercise (created by John Seed & Pat Fleming) used in environmental education, aiming at replacing the perception of a separate self with the notion of ecological, all-encompassing self. Experiential recognition of the evolutionary development of all life on earth, starting with the first cell, through amphibians, mammals, apes to human beings
(->DEEP ECOLOGY,->interbeing).

EXOTICS: Plants, animals, or microorganisms that are introduced by humans into areas where they are not native. Exotics are often associated with negative ecological consequences for native species and the->ECOSYSTEM.

EXTINCTION: The process by which a species ceases to exist.

EXTIRPATE: To eliminate or cause to be eliminated.

FACIATION: In ecology, a subdivision of an association determined by species composition.

FAUNA: All animal life associated with a given habitat, area, country, or period.

FEEDBACK: The informational response to a cause that tends to inhibit further repetition of the cause.

FERAL: An animal or population of animals that has escaped from cultivation or domestication and exists in the wild.

FLORA: All plant life associated with a given habitat, area, country, or period. Bacteria are considered flora.

FOOD CHAIN: A sequence of transfers of food energy from organisms in one trophic (food) level to those in another.

FOOD PYRAMID: The concept of diminishing->BIOMASS when considering trophic levels along the->FOOD CHAINS from producers to consumers.

FOOD WEB: The complex and interlocking series of food chains. A given organism may obtain nourishment from many types of organisms in a food web. The->BIOMASS and energy flow of the food web are in pyramid form (bottom to top).

FOREST: Generally, an->ECOSYSTEM characterized by a more or less dense and extensive tree cover. Specifically, a plant->COMMUNITY composed mainly of trees and other woody vegetation that grow, more or less, closely together. Coniferous forests (evergreen) retain their leaves throughout the seasons while deciduous forests shed their leaves at the end of the growing period or season.

FORESTER: A professional individual who has the responsibility for planning and execution of activities that allow the full values of forest resources to be perpetually obtained for human benefit and that recognize the forest as a living biological->COMMUNITY with interrelationships.

FOREST INFLUENCES: Total effect of forests on soil, water supply, climate and an—>ENVIRONMENT in general.

FORESTRY: Management of forest lands for the provision of the various goods and services that forests can continuously supply with attention that such yields are sustainable and that the resource base (essential ecological processes and->GENETIC DIVERSITY) is secured.

GAIA: ancient Greek name for the Goddess of the Earth; term used in->DEEP ECOLOGY to refer to the Earth as a holistic sentient being with intelligence and life of its own.

GENE POOL: Total genetic material possessed by a given reproducing population or species. As the basis of continuing->EVOLUTION, wild gene pools are the common heritage of mankind.

GENETIC DIVERSITY: The genetic materials associated with a variety and number of species of organisms. Protection of genetic diversity is essential to sustain and improve agriculture, -> FORESTRY, and fisheries, to keep open future options, to provide for a buffer against harmful change, and to have raw materials for scientific investigation as well as a moral principle to prevent species->EXTINCTION.

GENETIC EROSION: Term applied when many varieties of species are allowed to die out so that they are no longer available for breeding. (->GENE POOL)

GENOTYPE: The fundamental constitution of an organism in terms of its inherited characteristics (->PHENOTYPE).

GRASSROOTS MOVEMENT: A formal or informal environmental action group that develops from local activism on environmental problems. "Think globally—act locally."

HABITAT: The sum of environmental conditions in a specific place that is occupied by an organism,->POPULATION, or->COMMUNITY and where it naturally lives and grows.

HERBIVORE: An animal that feeds chiefly on plants (->CARNIVORE).

hinayana: lit. 'lesser vehicle'. Belittling term used for->Theravada Buddhism by later Buddhist schools of thought.

HOLISTIC APPROACH: Thorough and comprehensive analysis of interrelations between the natural->ENVIRONMENT, social, cultural, technological, and other factors, i.e., that the environment can only be understood by viewing it as a general complex of its parts.

HOMEOSTASIS: The abilities and mechanisms of organisms and->ECOSYSTEMS for self-regulation which enable them to constantly adjust themselves to the changing conditions of their environments and to maintain a stable state of dynamic equilibrium.

HOST: An organism which supplies benefits to another organism, generally a->PREDATOR.

HUMUS: Complex organic matter resulting from decomposition of plant and animal tissue in the soil, which gives to the surface layer of soil its characteristically dark color. It is of great importance for plant growth through retention of nutrients and moisture.

HYBRID: An organism resulting from a cross breeding between parents of different—>GENOTYPES.

INDICATOR: An organism, species, or->COMMUNITY which indicates the presence of certain environmental conditions.

INDIGENOUS: Refers to plant or animal species which is restricted to and characteristic of a certain area or location. A native species (not introduced).

IN SITU: In its original position or place.

INSTINCT: Unlearned behavior based on elaborate system of reflexes which when activated produce a fixed pattern of action.

interbeing: Buddhist teaching, derives from->dependent origination, all things are interdependent and interconnected, nothing can exist by itself (->DEEP ECOLOGY).

INTERDISCIPLINARY APPROACH: The utilization, combination, and coordination of (two or more) appropriate disciplines/specialists from the natural sciences, social sciences, applied sciences/technologies, and humanities in an integrated approach toward environmental problems. It generally includes frequent interactions/contacts between the disciplines/specialists under an ecological orientation.

INTERSPECIFIC: Relations between species.

INTERSPECIFIC COMPETITION:->COMPETITION between single members of different species.(->INTRASPECIFIC COMPETITION).

INTRASPECIFIC COMPETITION:->COMPETITION between single members of the same species.(->INTERSPECIFIC COMPETITION).

INVERTEBRATA: One of the two great divisions (sub-kingdom) of animals including those without a backbone, or spinal column.

ISSUE: A conflict (real or apparent) between the ends and/or interests of different individuals, groups or organizations.

jataka: Collection of 550 stories of the Buddha's previous lives, many of which are in non-human form.

JUNGLE: Land covered with dense growth of trees, tall interwoven vegetation. Sometimes applied to secondary vegetation types in the tropics (->TROPICAL FOREST;->RAINFOREST).

JUVENILE: Young of a species.

kalapa: Pali, subatomic particle, smallest unit of matter composed of the four elements (->dhatu)

kamma: Pali, (Sanskrit: karma) action, law of cause and its inevitable effect. (->paticca samuppada;->sankhara)

karuna: Pali, compassion, sympathetic suffering with other beings (->mudita,->metta).

katannu-katavedi: Pali, gratitude, thankfulness.

kaya: Pali, body.

khandha: Pali, aggregate. The five aggregates that a human consists of: (1) matter (->rupa), (2) consciousness (->vinnana), (3) perception (->sanna), (4) feeling (->vedana), (5) reaction (->sankhara)

kilesa: Pali, defilements, passions, impurities.

LAND CAPABILITY: Suitability and feasibility of an area of land for use(s) on a sustained basis. Possibilities of degradation and depletion should be taken into account when assessing land capability (suitability).

LIFE CYCLE: The phases, changes, or stages through which an organism passes throughout its lifetime.

LIFE EXPECTANCY: The average time an animal is expected to live after reaching a certain age.

LIFE FORM: The characteristic form of a plant or animal species at maturity.

LIFE SPAN: The length of time between the inception and death of an individual.

LIFE STYLE: A characteristically different way and pattern (style) of living for a given culture is often referred to as "mainstream" life styles while those which are uncommon are considered to be "alternate" life styles. Life styles vary in their interactions and effects on the->ENVIRONMENT, i.e., harmonious, exploitive, etc.

LIFE ZONE: Any of a series of biogeographical zones into which a continent, region, etc. is divided by both latitude and altitude on the basis of characteristic animal and plant life.

LIMITING FACTOR: A condition or factor whose absence, short supply, or excessive concentration exerts some restraining or negative influence upon a population which is incompatible with a given species requirements or tolerance.

LIMNOLOGY: The study of the physical, chemical and biological processes and features of fresh waters, especially lakes and ponds.

LITTER: The surface layer of loose organic debris in forests consisting of freshly fallen or slightly decomposed organic materials (->HUMUS).

magga: Pali, *Ariya atthangika magga*: Noble Eightfold Path, the Fourth Noble Truth (->sacca) leading to cessation of all suffering. Divided in three parts: (1)->sila/morality: right speech, right actions, right livelihood; (2)->samadhi/mental discipline: right effort, right awareness, right concentration; (3)->panna/wisdom: right thought, right understanding.

mahayana: lit. Great Vehicle, school of Buddhism, established around the third century after Buddha, introduced the bodhisattva ideal, focusing on compassion and liberation of all beings.

MAMMAL: A large class of vertebrates, which are warm-blooded, usually hairy and whose offspring are fed with milk secreted by the female mammary glands.

mara: Pali, evil force, personified worldly temptation.

metta: Pali, loving kindness, selfless love and good will, subject of meditation to develop friendliness and nonviolence towards all beings.

MICRO-CLIMATE: The climate of a particular->ENVIRONMENT resulting from the modification of the general climatic conditions by local differences, e.g., underground nest of ants.

MIGRATION: Movement of organisms generally determined by seasonality (birds), population pressure and/or environmental change.

MIMICRY: Protective similarity in appearance and imitation of one species of animal or plant by another.

MONOCULTURE: The raising of a single crop or product over large areas, often over long periods, destroying biodiversity in the given area.

MONSOON FOREST: Forest of monsoon regions, where seasons of heavy rainfall alternate with dry periods; both evergreen and deciduous (->TROPICAL FOREST;->RAINFOREST).

mudita: Pali, sympathetic joy, joy for other's well-being, success or happiness (->karuna).

MULTI DISCIPLINARY APPROACH: The combined utilization of selected disciplines/specialists wherein each is assigned a portion or segment of a given environmental problem; their partial recommendations are linked together at the end to form the final solution.

MUTUALISM: Association between organisms with mutual advantage to both or all organisms involved.

NATIONAL PARK: Relatively large land or water areas which contain representative samples and sites of major natural regions, features, scenery, and/or plant and animal species of national or international significance and are of special scientific, educational, and recreational interest. They contain one or several entire->ECOSYSTEMS that are not materially altered by human exploitation or occupation. National Parks are protected and managed by the government in a natural or near natural state. Visitors enter under special conditions for inspirational, educational, cultural, and recreational purposes.

NATIVE (of Species): Belonging to a locality as a part of the original->FLORA or->FAUNA.

NATURAL AREA: A physical and biological unit in as near a natural condition as possible which exemplifies typical or unique vegetation and associated biological, geological, and/or aquatic features.

NATURAL RESOURCES: A feature or component of the natural environment that is of value in serving human needs, e.g., soil, water, plant life, wildlife, etc. Some natural resources have an economic value (e.g., timber) while others have a "non-economic" value (e.g., scenic beauty).

NATURAL RESOURCES MANAGEMENT: The integrated and harmonious management of natural resources through utilization, protection, manipulation (change) and conflict reduction measures and activities. The management of human use of natural resources on a sustained use basis for present and future generations of human, animal, and plant life.

NATURAL SELECTION (Evolutionary concept): The process by which, in a specific—>ENVIRONMENT, those organisms well adapted to it are more likely to transmit their characteristics to descendants than those not so well adapted, e.g., survival of those individuals adapted to prevailing patterns of food,->COMPETITION, etc.

NATURE TRAIL: A route or trail designed so that students/visitors may observe and learn about the natural features, plants, and animal life. Ecological and conservation concepts and themes can be integrated into nature trails.

NEGATIVE FEEDBACK: Inclination of a system to counteract external influences and return to its own state of stability.

NICHE: The specific part or smallest unit of->HABITAT occupied by an organism. (->ECOLOGICAL NICHE)

nibbana: Pali, 'blowing out' (Sanskrit: nirvana), liberation from cycle of rebirth, cessation of suffering, enlightenment.

nivarana: Pali, hindrance, obstacle on the path of purification: (1) craving, (2) aversion, (3) torpor or languor, (4) restlessness, (5) doubt.

nivata: Pali, humility, non-greed.

OMNIVORE: An animal that feeds upon both plant and animal life (->CARNIVORE,->HERBIVORE).

OUTDOOR RECREATION: Leisure time activities which utilize an outdoor area or facility. A self-rewarding experience occurring in outdoor settings during non-obligated time, which results from free personal choice and commitment by the individual.

OVERPOPULATION: Vast multiplication of a species in a given area, which accordingly puts pressure onto the->ENVIRONMENT. (overpopulation of human beings one major factor of exploitation and destruction of ecological systems).

OVERSTORY: The layer of foliage in a forest canopy (->UNDERSTORY).

pali: language in North India during time of the Buddha. (->pali canon)

pali canon: Oldest collection of Buddhist scriptures, known as Tripitaka, or the Three Baskets. Consists of (1) *Vinaya-Pitaka*, Basket of Discipline; (2) *Sutta-Pitaka*, Basket of Discourses; and (3) *Abhidhamma-Pitaka*, Basket of Further Teachings.

pancha sila: the basic five Buddhist precepts of morality: (1) not to kill; (2) not to steal; (3) not to indulge in sexual misconduct; (4) not to lie; (5) not to use intoxicants. (->sila)

panna: Pali, wisdom, insight into the ultimate truth, result of practice of->sila and->samadhi, third of the three stages of the Noble Eightfold Path (->magga;->bhavana-maya panna)

parami: Pali, virtue, ten mental qualities that help attaining liberation: (1) charity (->dana), (2) morality (->sila), (3) renunciation (nekkhamma), (4) wisdom (->panna), (5) effort (->viriya), (6) tolerance (->khanti), (7) truth (->sacca), (8) strong determination (->adhitthana), (9) loving kindness
(->metta), (10) equanimity (->upekkha)

PARASITE: An organism living in or on another organism at the expense of the latter. (->HOST)

paticca samuppada: Pali, 'dependent origination' of phenomena, profound teaching of the arising and cessation of kamma-formations, or chain of cause and effect, all manifestations of mind and matter are codependent and interrelated
(->interbeing,->ECOLOGICAL BALANCE).

PESTICIDE: Any chemical substance used to kill plant and animal (and insect) pests. Some pesticides can contaminate water, air, or soil and can accumulate in humans, plants, animals, and the->ENVIRONMENT with negative effects.

PHENOLOGY: A study of natural phenomena that occur periodically such as migration of birds and how these events are influenced by environmental factors.

PHENOMENOLOGY: The study of all manifestation of mind and matter.

PHENOTYPE: The manifest characteristics of an organism, the appearance of an individual as opposed to->GENOTYPE.

PHOTOSYNTHESIS: The process by which plants form the sugar glucose from carbon dioxide of air and water by utilizing->CHLOROPHYLL and light.

PLANNING, ENVIRONMENTAL: Concerned with the consequences of human activities on the->ENVIRONMENT in terms of forecasting, anticipating, evaluating, and reconciling the demands for and impacts upon the environmental resources/amenities and->ECOLOGY with reference to the present and future->VALUES and options at stake.

PLANKTON: Microscopic floating aquatic plants and animals (->AQUATIC LIFE).

POLICY, ENVIRONMENTAL: Official statements of principles, intentions, values, and objectives which are based on legislation and the governing authority of a state and which serve as a guide for the operations of governmental and private activities in environmental affairs.

POLICY, ANTICIPATORY: Policies that attempt to anticipate significant economic, social, and ecological events rather than simply react to them. Involves actions to ensure that ->CONSERVATION and other environmental requirements are taken fully into account at the earliest possible stage of any major decision likely to affect the->ENVIRONMENT. A policy/planning process which attempts to foresee potential problems and to develop solutions to them before they become real and current problems.

POLITICS: The conflicts between competing->VALUES and interest through human interaction in the struggle for power to attain a governmental decision/policy/solution. The activity by which an issue or problem is agitated or settled. All efforts/pursuits by involved interest to resolve conflicts by getting government to impost decisions/solutions.

POLLUTANT: Any extraneous material or form of->ENERGY whose rate of transfer between two components/factors of the->ENVIRONMENT is changed so that the well-being of organisms/ECOSYSTEMS is negatively affected. Any introduced gas, liquid, or solid that makes a resource unfit for a specific purpose or that adversely affects human, plant, or animal life.

POLLUTION: The presence of matter or energy whose nature, location, or quantity produces undesirable environmental effects. The contamination or alteration of the quality of some portion or aspect of the->ENVIRONMENT and its living organisms by the addition of harmful impurities.

POPULATION: An interbreeding group of plants or animals. The entire group of organisms of one species.

POPULATION CONTROL: All methods utilized for conception/birth control in order to control population growth, including natural or deliberate changes in economic, political, and social conditions. All factors that regulate the size of a population.

POPULATION DENSITY: Number of organisms in a particular population in a given area at a given time.

POPULATION CYCLE: Regular patterns of changes in a population over a period of time. The cycle is affected by food supply, physical conditions, disease and->COMPETITION.

POPULATION PRESSURE: The force exerted by a growing population upon its->ENVIRONMENT.

(->OVERPOPULATION).

PREDATOR: An interaction in which one organism (predator) kills and eats another organism (prey).

PREY: An animal hunted or killed and used as a food source by another animal.

PRIMARY PRODUCTIVITY: The productivity of green plants.

PRIMARY SUCCESSION: Progression of communities into a newly exposed habitat devoid of life.

PRODUCERS: Mainly green plants that synthesize their own organic compounds from inorganic substances. Self nourishing and the first group in the food chain.

PRODUCTIVITY: The ability of a population to recruit new members by reproduction.

PUBLIC INTEREST: An abstract and symbolic concept which refers to the ends,->VALUES, benefits, or costs for the general or common interests of all of the public. The public interest is often subject to various justifications and interpretations, but implies the overall interest of the general public of the whole society over short and long term considerations as contrasted to the private interests of given individuals, groups, and organizations which make up part of society over short term/immediate considerations.

PUBLIC PARTICIPATION: The involvement, informing, and consultation of the public in planning, decision-making, and management activities in environmental affairs. The public actively sharing in the decisions that government makes in environmental affairs by having individual and group views taken into account through various participation measures which involve the public. Public participation requires adequate non-technical information for inputs as well as adequate encouragement and opportunities.

puja: religious ceremony, ritual, worship.

PYRAMID (of->BIOMASS): The biomass measured at producer/consumer levels (->FOOD PYRAMID).

QUALITY OF LIFE: A subjective concept which characterizes the measure of the degree to which a given society offers effective opportunity to a combination of physical, social, and cultural components in the total->ENVIRONMENT. A broad and all-encompassing concept which refers to the quality characteristics of all aspects of one's environment and life.

raga: Pali, craving, one of three principal mental defilements (->avijja,->dosa).

RAINFOREST: A dense, close vegetation type containing a large number of species per unit area. Associated with high rainfall and humidity (->TROPICAL FOREST, ->MONSOON FOREST).

RANGE: The geographical distribution of biological forms.

RED DATA BOOK: A book listing threatened and ->ENDANGERED species and subspecies of vertebrae (animals with backbones) animals, including information on their status and measure for protection. Red Data books are published through the Survival Commission of the International Union for Conservation of Nature and Natural Resources as well as by other nations.

RESERVES: Natural or near natural areas of land and/or genetic resources (threatened or—>ENDANGERED species) interest, including representative or unique ecological communities. Economic and human activity is usually controlled, compatible, or prohibited in terms of the natural state of the reserve and its category, e.g., strict nature reserve, managed nature reserve,->WILDLIFE sanctuary, etc.

rupa: Pali, matter, form (->khanda)

sacca: Pali, truth; *Ariya-sacca* The Four Noble Truths: (1) truth of suffering, (2) truth of origin of suffering, (3) truth of cessation of suffering, (4) truth of path leading to cessation of suffering. (->magga)

samadhi: Pali = concentration, mental discipline, collectedness of mind to gain the wisdom (->panna) of insight into ultimate truth; one of three stages of the Noble Eightfold Path (->magga,->sila).

samsara: Pali, continuity of existence, cycle of rebirth.

SANCTUARY: An area, usually in natural condition, which is reserved (set aside) by a governmental or private agency for the protection of particular species of animals during part or all of the year.

sangha: Pali, orig. community of Buddhist monks and nuns, later including lay-devotees (->bhikkhu).

sanna: Pali, perception, is conditioned by past mental formations (->kamma)

sankhara: Pali, conditioned things and states, mental formation that leads to certain reactions and new conditionings (->kamma). Part of->paticca samuppada and one of five ->khandhas.

sanskrit: classical language of Hindu India.

sati: Pali, mindfulness, careful attention, alertness.

SERE: A series of stages of community change in a particular area leading towards a stable state (->ECOLOGICAL SUCCESSION).

sila: Pali, morality, ethical conduct, preparatory refinement of attitude and action for progress towards enlightenment; one of three stages of Noble Eightfold Path (->magga,->samadhi, ->panna).

SOIL: A natural body, synthesized in profile from a variable mixture of broken and weathered materials and decaying organic matter, which covers the earth in a thin layer and which serves as a natural medium for the growth of land plants. Soil usually takes long periods of time to form through the natural processes. Soil types include sand, clay, silt, loam and peat or any mixture of these.

SOIL EROSION: The detachment and movement of->SOIL from the land surface by wind or water.

SOIL FERTILITY: The quality of->SOIL that enables it to provide nutrients in adequate amounts and in proper balance for the growth of plants.

SOIL HORIZONS: Characteristic strata below the surface distinguishable as (1) topsoil, (2) subsoil and (3) parent material.

SPACESHIP EARTH: A concept/philosophy for understanding the earth as a spaceship with a limited life supporting system or as a finite, complex->ECOSYSTEM in which survival requires wise management of limited resources and harmonious human and environmental relationships.

SPECIES: Natural population or group of populations of plants or animals that transmit specific characteristics from parent to offspring. They are reproductively isolated from other populations (species).

SPECIES, DIVERSITY: The number of different species occurring in a given location or under some condition. The ratio between the number of species in a biotic community and number of individuals in a given species. Diversity is generally correlated with ecological stability.(->BIODIVERSITY)

SPECIES, ENDANGERED: In danger of->EXTINCTION; survival unlikely if the causal factors (threats) continue to operate. It is recognized that numerous->ENDANGERED species (as well as other threatened categories of species) may not have been formally “discovered” or officially classified at this point, particularly those in->TROPICAL FORESTS which contain the greatest abundance and diversity of species.

SPECIES, INDICATOR: A species whose presence, absence, distribution, or abundance can be used to measure the effect of some influence, action, or factor on the biotic community, e.g.,->POLLUTION, development, etc.

SPECIES, RARE: World population is small and "at risk" but not yet->ENDANGERED or vulnerable. However, it would be possible to endanger them, or even make them extinct, with sudden or anticipated changes. This is particularly true of rare species that have a restricted world range.

SPECIES, VULNERABLE: A species not yet->ENDANGERED, but likely to be if the casual factors (threats) continue to operate.

SPORADIC: Widely scattered biological form.

STENOTOPIC: Organisms that display a very narrow range of tolerance.

STEWARDSHIP: The wise use and management of the->ENVIRONMENT and its resources in terms of the recognition of living relationships and responsibilities for the environment and for future generations of all forms of life. Stewardship implies that humankind respect, oversee, and conserve the environment for present and future considerations for all life through individual and collective efforts and responsibilities.

stupa: usually dome-shaped building as a memorial or reliquary to the Buddha or other important teachers of Dhamma.

SUBCLIMAX: A stage of succession prevented from progressing to the climatic climax by fire, soil deficiencies, grazing, and similar factors.

SUBSOIL: The layer of soil beneath the surface soil, in which the roots normally grow.

SUBSPECIES: A division of a species based most often on geographical distribution and/or taxonomic characteristics. Subspecies have interbreeding potential.

SUCCESSION:->ECOLOGICAL SUCCESSION.

SURVIVAL OF THE FITTEST: Popular term for->NATURAL SELECTION.

SUSTAINABLE: The concept of maintaining continues productivity; application of systems and measures which will maintain the capacity of production without decline.

sutta: Pali, lit. 'thread', Buddhist scriptures.

SYMBIOSIS: An association of two or more organisms of different species in which one or more may benefit and none are harmed (->ANTIBIOSIS).

SYMPATRIC: Pertaining to two or more substances being greater than the action of each individual substance.

SYNECOLOGY: The study of a group of organisms associated with another as a composite unit; organized at community level (e.g.->POPULATIONS).

tathagata: Pali, lit. 'truth-arrived', a term used by the Buddha referring to himself or other Buddhas.

TELEOLOGY: View that developments in nature occur because of the purpose that is served by them. Attributing use(s) or parts of plants and animals, often in terms of projected utilization, e.g. a pattern of eyes on a butterfly to scare away birds (->ANTHROPOCENTRIC,->ECOCENTRIC,->DEEP ECOLOGY).

TERRESTRIAL: Of the land, not the water.

TERRITORY: An area over which an animal or group of animals establishes jurisdiction. Activity associated with an organism claiming an area and defending it against members of its own (or similar) species. Area within the home range of an organism that is actively defended against other organisms.

theravada: lit. teaching of the elders; school of Buddhism found mainly in Southeast Asia (->mahayana,->vajrayana).

THRESHOLD: The maximum or minimum duration of intensity of a stimulus that is required to produce a response in an organism. Also called the critical level.

TOLERANCE: The ability of an organism to adjust to or endure changes in its—>ENVIRONMENT. A species is confined by the extremes of environmental adversities that it can withstand. Also the safe level of any chemical applied to crops.

TOPOGRAPHY: The relief of an area of land, e.g., mountains, flat, hills, meadows, swamp, etc. The physical shape of the ground surface.

TRAINING, ENVIRONMENTAL: Instructional programs, courses and workshops on environmental affairs/topics for governmental personnel relative to their organizational responsibilities and activities. Training increases and enhances the knowledge, skills, and attitudes needed by personnel to work toward the prevention and solutions of environmental problems. A major constraint on the implementation of conservation measures is the lack of trained personnel.

TRAINING, ENVIRONMENTAL IN-SERVICE: Centered upon the participant (personnel) within governmental settings and responsibilities. Provides one of the most effective, economical, and practical ways for reaching large numbers of personnel with environmental training through short courses, seminars, and workshops, and through integrative/infusion approaches

in regular training programs. It is particularly advantageous for training personnel at the regional and field locations of their organizational settings.

TRANSIENT SPECIES: A species that migrates through a locality without breeding or over-wintering.

TREE: A wooden perennial plant with one main stem or trunk and a definite crown shape, usually at least five meters tall when mature.

TREE LIMIT (Line): The altitude in mountains, or in the southern or northern latitude, at which only isolated trees grow and beyond which only stunted forms occur.

TROPHIC LEVEL: The level at which food energy is transferred from one organism to another. The place of an animal in the food chain.

TROPHIC STRUCTURE: Organization of the->COMMUNITY based on feeding relationships of->POPULATIONS.

TROPHIC WEB: A descriptive network, showing the feeding relationship of an—>ECOSYSTEM.

TROPICAL FORESTS: Forest communities that are maintained by the rain/moist climates of tropical regions. Contain the greatest abundance and diversity of plant and animal species and are identified as a conservation priority by the World Conservation Strategy due to their rapid rate of exploitation and disappearance. Two types of tropical forest: (1) dry forest with seasonal rain and (2) wet forest with rain over extended periods.

TROPISM: The tendency of a plant, animal or part to grow or turn in response to an external stimulus either by attraction or repulsion, e.g., a sunflower turns toward light.

UBIQUITOUS: A plant or animal species that is capable of thriving under varying environmental conditions. Present or giving the impression of being present everywhere.

UNDERGROWTH: Collectively, the shrubs, sprouts, seedling and sapling trees, and all herbaceous plants in a forest.

UNDERSTORY: A layer of foliage below the level of the main tree canopy (->OVERSTORY).

upekkha: Pali. equanimity, evenmindedness, (->parami).

upadana: Pali, grasping, clinging, attachment.

vajrayana: Diamond Vehicle, school of Buddhism derived from ->mahayana, manifest in Tibetan Buddhism.

VALUES: Formed by groups of attitudes that cluster. Values produce behavior as contrasted to attitudes that represent a behavioral disposition, potential, or tendency. Values are an individual or collective conception (emotional, judgmental and symbolic components) of that which is of worth, importance, or desirable.

VALUES CHANGE: Occurs when values held by individuals, groups, or society are no longer satisfying to those who hold them. Environmental education and training implies change toward the development and encompassment of values that are more responsive and attuned to human/environmental ends and interrelationships, including toward harmony with the environment.

VALUES CLARIFICATION: An approach which helps individuals to become more aware of their personal->VALUES, attitudes, beliefs, and behavior toward the->ENVIRONMENT as well as to develop their own set of values and commitments in issues/problem-solving activities. It involves considering alternatives, the consequences of alternatives, and personal feelings (values and attitudes) toward each alternative before deciding or acting.

VALUES, ENVIRONMENTAL: An individual or collective conception of objects/factors which are worthwhile or desirable in the->ENVIRONMENT. Usually associated with emotional, judgmental, and symbolic components toward the environment.

VALUES, INTANGIBLE: Values that are difficult or impossible to define, formulate, or quantify. Pertain to resources, aspects, and factors of the environment that are not directly quantifiable, describable, or assigned market/ monetary values. They often include psychic and indirect benefits and are associated with aesthetic, scientific, historical, and recreational considerations and aspects of the natural environment. Intangible values greatly contribute to humanity and the human spirit through contact with nature/environment.

VALUES JUDGMENT: An estimate and/or more or less subjective opinion about the worth, good, desirability, negativity, harm, etc., of a thing, action, proposal, or entity. Value judgments influence the selection and evaluation of the ends and means of action criteria and underlie developmental and environmental decisions.

VARIATION: Divergences in the characteristics of organisms caused by the—>ENVIRONMENT or by differences in genetic constitution (->GENOTYPE;->PHENOTYPE).

VARIETY: A group of organisms that differ from others within the same species.

vedana: Pali, sensation, feeling. (->khandha)

VEGETATION: All plants in general in a given area. Total plant cover on the Earth (->FLORA).

VERTEBRATA (CRANIATA): Animals that have an internal skeletal system. Contains the fish, amphibians, reptiles, birds and mammals. (->MAMMALS).

VIABLE: Living, reproducing systems.

vinaya: Pali, discipline, first part of the tripitaka (three baskets) of the->pali canon, the oldest Buddhist scriptures.

vinnana: Pali, consciousness, cognition (->khandha)

vipassana: Pali, insight, meditation based on satipatthana sutta, contemplative investigation into the nature of all phenomena, leading to wisdom (->panna).

viriya: Pali, effort, (->parami).

viveka: Pali, detachment.

WATERSHED: An area of land from which all precipitation drains to a specific watercourse or outlet. The boundary line of a watershed is the natural ridge that divides one drainage area from another. The area drained by a stream.

WETLAND: An area that is regularly wet or flooded, and where the water table (the upper level of the groundwater) stands at or above the land surface for at least part of the year.

WILDERNESS: A large, wildland area where the earth and its of undeveloped land which retains its primeval character and influence community of life are untrampled by people and where people are visitors who do not remain. An area without permanent improvements or permanent human habitation and which is protected and managed so as to preserve and protect its natural conditions and life. Many->ENDANGERED and threatened species need wilderness type areas to carry on their struggle for survival.

WILDLIFE: All non-domesticated (wild) mammals, birds, reptiles, and amphibians living in a natural environment.

ZONATION: Distribution of organisms and communities into well-marked bands, zones.

ZONING: System of land use planning based on boundaries inside which areas can be used only for specific purposes, e.g., agriculture, dwellings, etc.

IV. APPENDIX: DHAMMA/DEEP ECOLOGY EXPERIENTIAL EXERCISES

He or she who wants to attain peace should practice being upright, humble, and capable of using loving speech. He or she will know how to live simply and happily, with sense calmed, without being covetous and carried away by the emotions of the majority. Let him or her not do anything that will be disapproved of by the wise ones.

(And this is what he or she contemplates):

May everyone be happy and safe, and may their hearts be filled with joy.

May all living beings live in Security and in Peace—beings who are frail or strong, tall or short, big or small, visible or not visible, near or far away, already born or yet to be born. May all of them dwell in perfect tranquility.

Let no one do harm to anyone. Let no one put the life of anyone in danger. Let no one, out of anger and or ill will, wish anyone any harm.

Just as a mother loves and protects her only child at the risk of her own life, we should cultivate Boundless Love to offer to all living beings in the entire cosmos. We should let our boundless love pervade the whole universe, above, below and across. Our love will know no obstacles, our hearts will be absolutely free from hatred and enmity. Whether standing or walking, sitting or lying, as long as we are awake, we should maintain this mindfulness of love in our own heart. This is the noblest way of living.

Free from wrong views, greed, and sensual desires, living in the beauty and realizing Perfect Understanding, those who practice Boundless Love will certainly transcend Birth and Death.

UNIVERSE AND COMPASSION BY ALBERT EINSTEIN

A human being is part of a whole, called by us, Universe, a part limited in time and space. He experiences himself, his thoughts and his feelings as something separated from the rest; a kind of optical illusion of his B consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and affections for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole nature in its beauty.

BUDDHIST SPIRITUAL FOOD REFLECTION FROM THAILAND

The following food reflection was found at Suan Mokkh Buddhist Forest Monastery at Chaiya, Thailand. Now deceased Ajahn Buddhadassa tranlated this food reflection from Pali, the original language of Buddhism in India, into Thai and Ajahn Santikaro and Ajahn Dhammabalo translated it from Thai to English.

With wise reflection I eat this food
Not for play, nor for intoxication
Not for fattening, nor for beautification
Only to maintain this body-
To stay alive and healthy
To support the spiritual life.

Thus I let go of unpleasant feelings
And do not stir up new ones
Thereby the process of life goes on
Blameless, at ease, and in peace.

A fundamental aspect of meditative and spiritual life is a mindful and wise use of the necessities of life-clothing, food, shelter, and medicine. Of these, the Lord Buddha gave special emphasis on food and to the practice of moderation in eating.

This food reflection is not a prayer of grace. A wise reflection is a means of working toward right understanding and right intention, the first links of the middle way. We begin by considering what food is not for-some silly, frivolous, and dangerous reasons for eating: games, entertainment, culinary, competition, sensual indulgence, and vain shaping of the body. Then we consider what food is for: to maintain physical health for the Brahma Cariya—the highest most exalted spiritual life.

To let go of unpleasant feelings or to get rid of them, refers to the mental dissatisfaction or disliking that we know as hunger. To not cause new ones to arise means not to cause new Dukkha (problems or troubles), feeling bloated, cramped, lazy, sleepy-by overeating or eating too quickly or ravenously. Thus when practiced wisely, eating helps to clean up old Dukkha without causing any new Dukkha. In this way, life continues with fewer difficulties, in purity and peace and in physical/spiritual health.

A DOVE IN THE FOREST (old Jataka Tale)

A long time ago, there was a thick forest. Trees were fresh and deep. The air was crystal clear; it was sending the echoes of birds singing a beautiful melody, enchanting comfortable life there. The sky was so blue and open. The forest was full of grace, hope and peace. In this forest, there were thousands and thousands of creatures living together as one in harmony with nature.

One day, a dove flew over the forest to look for food for its babies. When she returned, the dove saw a big fire rising up in the forest! All the living creatures, including birds, animals, plants, and flowers were trying to escape, desperately crying for help in this terrible disaster.

The dove was astonished to see this happening, yet had no time to think. She immediately flew off to a lake far away. When the dove arrived at the lake, she jumped into the water and had its body completely soaked. The dove flew up again and hurried into the burning forest. Flying back to where the fire was blazing briskly, the dove shook its body and dropped a few

portions of water. Then she took off to a long flight to get to the lake again. In this way, the dove made many trips between the lake and the forest.

The Heaven above, upon watching what was happening in the forest on the earth, asked the dove,

"Do you think that you, of humble body, can stop the fire with those few shakes of water?"

The dove answered,

"The fire must be stopped as soon as possible. There are children. There are my fellows. And there is the very forest who nurtures all of our lives. Everything is caught is a big fire now. I have something to do. I will continue making trips this way, until I die."

Eventually, the earnest wish and the prayer of this one little dove was taken to the Heaven. A heavy rain was brought to the forest and the fire ceased. The forest returned to a peaceful, beautiful place that it once was.

BUDDHISM AND DEEP ECOLOGY WORKSHOP

This workshop will deal with Buddhism and Deep Ecology (considered the spiritual dimension of environmentalism), on an interdisciplinary, value, and holistic basis with attention to the needs and interests of the participants. The presentations will consider some of the basic ideas of Buddhism (*Dhamma*) and Deep Ecology as they relate to each other and to protecting natural forests and the environment. The workshop will include ecological experiential exercises such as the Council of All Beings, the burning of ecological defilements, guided tree, evolution, and oneness meditations, vision quest, ecology walks, etc. Shorter versions of the workshop, including talks and lectures on the subject, are also available.

The instructor, Daniel H. Henning, Ph.D., is Professor Emeritus of Political Science and Environmental Affairs, Montana State University, Billings. He has served as a park ranger naturalist at Glacier, Yellowstone, and Rocky Mountain National Parks and a protected area consultant/trainer for the United Nations and IUCN in Asia. A past Senior Fulbright Research Scholar with numerous books and articles, he has had over ten years of experience in working with Buddhism, Deep Ecology, and tropical forests in Southeast Asia while residing in Thailand, often living in Buddhist Forest Monasteries. Dr. Henning has completed a United Nations study on the ecological and environmental teachings of Buddha and is the author of BUDDHISM AND DEEP ECOLOGY.

First Day:
Introduction
Buddhism and Deep Ecology Talk (l)
Oneness Guided Meditation

Buddhism and Deep Ecology Talk (2)
Ecological Grieving
Evolution Guided Meditation
Burning of defilements

Second Day:
Forest Talk
Deep Ecology Walk
Tree Meditation

Vision Quest
Council Preparation
Council of All Beings
Ecology Stories

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DHAMMA/DEEP ECOLOGY EXPERIENTIAL EXERCISES

"Reading Plato or listening to a lecture on T.S. Eliot doesn't educate the whole human being; like courses in physics or chemistry, it merely educates the symbol manipulator and leaves the rest of the living mind-body in its pristine state of ignorance and ineptitude." (Huxley, 1962)

A variety of exercises and approaches lend themselves to reconnecting people with nature on an ecological, experiential basis. The best emphasize experience over intellectual knowledge. Some of these methods, exercises, and approaches are presented in this chapter. The nature and mechanics of these exercises are as follows:

Buddhism and Deep Ecology Trip

Susan Offrer recalled her experience under the tutelage of renowned forest monk, Phra Prachak:

> It was called a Buddhism and Deep Ecology Trip. I knew we would be walking in Dong Yai forest for one week with Phra Prachak, the forest monk well known for his conservation efforts and tree ordination ceremonies, but I didn't really understand what "deep ecology" meant.
>
> *Thinking like a Mountain*, a book by John Seed on Deep Ecology, told me. But our weeklong experience taught me what it really means.
>
> Our 30-strong group included Luang Phra Prachak with several monks and nuns, eight villagers who have lived in and near the forest all their lives, and 13 international participants of the International Conference of Engaged Buddhists. We carried with us not only our sleeping bags and camping gear, but our diverse cultural, religious, and personal baggage that would shape our experiences and color our observations.
>
> Laung Phra Prachak embodied two objectives. The first would teach us to meditate, clear our minds, watch our breath, and focus on our inner selves. Luang Poh urged us to reach a deeper level of meditation and to free ourselves of worry and fear and desire by looking inside. He instructed us in walking meditation to feel the earth with our feet, enabling us to remain steady and surefooted.
>
> Phra Prachak would show us the destruction of the forest, and outline his campaign to preserve it.
>
> At some point, however, the two lines of thought converged.
>
> Luang Phra Prachak stressed opening ourselves to experience the forest with all whole beings. He illustrated the connection between our inner selves and the environment:
>
> "If you have a tiger inside you, you will meet a tiger outside as well. First, get rid of the tiger inside you," he said.
>
> Then, this serenity will help us perceive in new ways any threats from outside "tigers", and if we do by chance discover a tiger near us, we will know better how to respond.

Luang Poh used the forest—the trees, leaves and rocks—as object lessons in his frequent Dhamma talks. These were short teachings by analogy and implication.

"I am a leaf," he said. "We are all leaves. We share life needs and life processes. We become alive, grow. wither, and die. We are dependent on each other in one interconnected ecosystem."

Asked how he managed to continue his struggle to save the forest with so much positive energy in the face of government pressure and military threats, he replied:

"Is that rock over there heavy? Not if you don't lift it. Remember that now in your life: if you don't lift it, it isn't heavy."

At every rest along the trail Luang Poh shared spiritual philosophy and practical wisdom. He taught us we have a responsibility to promote social justice for all creation, not just humanity.

We did not enter the forest alone. Villagers carrying enormous food packs, monks and nuns with food bowls and glots, and backpacks, illustrated our attachment to material comforts and convenience.

We trudged through cassava fields into the forest, dense undergrowth, thorn and vines impeded every step, tangling our hair and raking our skin. Luang Phra Prachak disciplined us through walking meditation.

After meditation and chanting and hot drinks, we began our trek, around 10 a.m. for the day's lone meal.

We walked several hours, pausing to mourn at huge, felled trees blocking our path. Two logging gangs we met reminded us these trees are lumbers that support their families. Clearly, forest conservation is not a black-and-white issue.

Each night we camped amid dense jungle. No cleared, level campsites. Lots of nocturnal forest life joined us as we slept; we heard scamperings, hummings, and rustlings.

Our drinking water dissipated quickly despite the numerous tanks the villagers carried for us. Water became a key concern.

We found water in slow trickles, muddy puddles, or in the dark soup of decaying leaves. Hot chocolate or sweet coffee disguised the taste and color of water we would not have wanted to bathe in before.

Droppings at water's edge showed elephants bathed and drank there. So why couldn't we?

Our days were variegated by changes in terrain, talks by environmentalists in the group, and regular gatherings by candlelight among the trees.

After the silent walking, we shared painful experiences of nature's destruction and joyful experiences of nature's wonder.

Luang Phra Prachak told us of his struggle for this forest—protests, arrests, and ongoing conservation efforts.

In one of our rituals, we each imagined ourselves as one part of nature, and spoke out about its life and experiences. We heard the "voice" of leaf, hornbill, otter, air, eucalyptus, and water buffalo.

Then, the eldest villager roared: "I AM AN ELEPHANT!" When he had finished his story, we knew further logging of this forest would be the death sentence for the elephants roaming there.

Mid-trip, we scattered to split up and spend 24 hours alone, contemplating and observing the forest. Luang Phra Prachak coached us how to deal with fear in the darkness of the wild.

Our solitude became a waking dream filled with the roar of elephants nearby; flashes of intense fear or an unseen animal lying down to sleep beside an umbrella tent.

We gathered at our next noon meal, feeling a part of forest life, yearning to coexist without endangering nature, realizing that to do so would endanger ourselves.

We walked through kilometre after kilometre of eucalyptus plantation that had supplanted the rich diversity of the forest.

Charged by our powerful experience, we separated after committing ourselves to concrete action to preserve the environment, in particular this forest in Buri Ram.

Each of us understood Deep Ecology in ways shaped by our personal belief systems. Though our experiences differed, we shared a spiritual philosophy of the environment.

To me, Deep Ecology recognizes the sacredness of creation, our humble role in it, and our responsibility, now, to reverse the damage we have so carelessly done through neglect, over-consumption, and greed.

It also emphasizes the interdependence of all beings and parts of nature, the need for us to identify with these parts, and join with them in their cry for survival. If we destroy them, we destroy the balance that guarantees our own survival.

We are leaves. They neither possess, nor control, nor take more than they require. We must learn to be leaves."(Offrer, 1993)

HOW TO LEAD ECOLOGY WALKS

Begin with background reading on ecology. Otherwise, a group may be exposed to a random bunch of plant and animal names with little ecological understanding or insight.

Ecology, the study of interrelationships between plants, animals, and their environment, provides a central focus for the walks. It also offers a means for illustrating the inter-dependencies of people and nature. A basic understanding of simple ecological concepts is essential. Some of these concepts were discussed in the previous chapter. Literature on the

subject can be obtained at almost every library and there are now large numbers of paperbacks on ecology available.

Elementary ideas and principles of ecology can be understood by anyone. Human relationships with nature should be based on an understanding of ecology principles. All living things, including human beings, are related and interdependent with one another in some manner. What affects or influences one form of life will, directly or indirectly, affect others. Ecological concepts to be studied on walks include: habitats, food chains or pyramids, biodiversity, territoriality, succession, competition, ecotones, niches, biomes, adaptations and energy flows.

With a little imagination, these concepts can be reduced to simple ideas. For example, biodiversity can be illustrated by simply counting the large number of species of plants, trees, insects and other life forms in a given area. Ecotones can be identified as boundary areas, for example, between forest and grassland communities.

In a tropical forest, competition for sunlight is a very important concept in tree and plant distribution. The tops of the tallest dominant trees make up the canopy layer that receives full sunlight. Thus it produces more food than does any other layer and many birds, animals, fungi, and insects live there. Shorter trees grow beneath the canopy and form the understory. These understory trees receive less sunlight than canopy trees and consequently produce less food. Some understory trees may eventually join the canopy layer. The shrub layer beneath the understory consists of many shrubs or woody plants that have more than one stem, while the herb layer beneath the shrub layer is made of soft-stemmed plants.(Camp, l984)

Look for special survival strategies. Some plants have developed reflective blue cells to use the light of the forest's dim understory. Berry bushes offer birds fruit in exchange for spreading their seeds. Berries contain a mild laxative that ensures the seeds are deposited rather than digested. Owls hunt at night when most small mammals are active. The bright coloring of warblers ensures the purity of their genetic line in a woods shared by a dozen closely related cousins.

The forest floor consists of the soil, small living organisms, and droppings. Almost all the nutrients of the forest are contained in the leaves associated with the forest floor layer.

Some trees shed their leaves all at once, enabling them to grow a new crop while recycling the old crop at their feet. Some trees even kill others to feast on the falling leaves. Many species linger as shrubs or seeds in the dim light of the under story. A storm rages and a giant tree falls, tearing an opening in the canopy that permits sunlight to reach the forest floor. A race to claim the new opening ensues. The winner flourishes as a new monarch of the forest. Losers wither and wait.

In a tropical forest, the majority of life thrives in the canopy. Wildlife is often difficult to observe during the day. Most animals feed at night. Overnight trips present more opportunities for observing nocturnal wildlife. During the day, bird and insect life, including butterflies, add much to ecology walks.

Every area offers something to illustrate ecology concepts. Ask someone familiar with ecology to take you for a short nature walk. Your guide will note several examples in a short

time and distance. You will be amazed at how much you understand of the how's, why's, and wonders of the area and its life have increased. Too often, without ecological observation, we walk cut off from this rich and essential understanding.

Planning ecology walks requires familiarity with the area and its life. A wealth of information and literature is usually available for most general localities through libraries, natural history museums and government agencies. A knowledge of some of the common names of the plants, birds, insects and other animals in the area can be learned from field guides before and during the walk or by a pre-trip with a local individual. The best field guides have pictures and simple identifications so that everyone can get involved in looking up the name of that "new" wild flower, tree, bird or animal.

Conducting the walk

With the emphasis on ecology, it is helpful to formulate and define the general objectives of the walk before departing. People usually see only what they are looking for. Objectives build a sound environmental attitude. These objectives should relate to the interdependence and interrelations of living things as well as the role and responsibility of people. If several walks are planned for one area, each walk might stress a particular or general aspect of life, e.g. water, insects, soil. Other aspects then can be related: the relationship of water to plant life, the relationship of water to wildlife, and so forth.

It would be interesting, for example, to have a walk with the objective centering strictly upon the influences and history of people on a given area in terms of environmental quality. But objectives should not be rigid. Flexibility, fun, interest, and the "unexpected" should also be guiding principles in this experience.

It is perfectly proper to say, "I don't know," when necessary. An effort should, however, be made to find out. Attention should be directed to what the leader does know as well as leading the group in possible explanations. It is essential to keep one's objectives in mind throughout the walk in reference to: (a) showing the interrelationship of different forms of life, (b) stressing the interdependence of life, (c) introducing ecological ideas, and (d) pointing out the role and responsibilities of people on the basis of the above.

The names of plants and animals need not be over-emphasized. One should not "lose sight of the forest for the trees." Nevertheless learning exercises such as counting the different plant species to illustrate biological diversity, observing the canopy and other forest layers, or searching for obvious signs of competition and ecotones, can be very helpful in illustrating ecological ideas and relationships.

A good learning situation should be created. A leader should be enthusiastic in helping other members of the group enjoy these natural wonders. Questions and humor should be encouraged. Informal conversation on the walk should be directed toward ecology and environmental responsibility, with special reference to involvement and participation. The leader should walk

at the head of the group, keeping the members together at all times. When stopping to make explanations, eye contact with all members of the group is important.

The group should experience the various forms of life encountered through all senses, e.g., listening for sounds of wildlife, feeling soil texture, touching, tasting, and smelling plant and tree life as well as seeing. It is often interesting, particularly for the children, to tell a brief story about a plant or animal from the previous sources mentioned. It is often meaningful, however, to have the members walk in silence for some time, preferably with a considerable space of about 100 meters between them. Continuous conversation and communication of any kind may sometimes result in "small talk" and distract from the natural experience and awareness in nature. Contemplation and reflection on nature through silent periods should be incorporated into the walk so that the participants can "absorb" the total experience.

After The Walk

At the conclusion of the ecology walk, the leader summarizes the group's observations and members share their experiences and ideas. Most facts and details are easily forgotten, but people will usually remember major ideas about ecology and their personal involvement.

AWARENESS EXERCISES IN NATURE

Exercises in nature should be simple, easy to explain and to carry out, while addressing adults and children alike. Long explanations and details may distract the general outlook and/or inhibit the participants in their free expression and participation. Some of the following exercises could be applied to indoor as well as outdoor experiences.

Awareness of the six sense-doors:

The six sense-doors as described in the Buddhist teachings are: Ears, eyes, nose, tongue, body, and mind.

Close your eyes, close your nose with one hand and gently breathe through the mouth and listen. Try to put the whole consciousness into the sense of hearing. What are the sounds you encounter? Sounds near you or in the distance, sounds from the wind and animals such as birds and insects.

Close your ears with your hands and open your eyes, note everything that your eyes encounter, the colors, shapes and forms, the light, the dark, the shadows and movements.

Close your eyes again and see what your nose will experience. Take a few deep breaths and smell . . . Then breathe through your mouth and try to distinguish between different tastes of the air, the air that enters your body and the air that leaves your body when breathing out.

Walk around and touch the trees, leaves, berries, flowers, grass or water; whatever is there, touch it gently and examine the different surfaces of form.

Let your mind wander for a while. What does the surrounding environment remind you of? Recall pictures from the past and see how they affect your present mind.

Looking for signs of impermanence:

Find signs of impermanence in your present environment. Look for natural indications of dying or death such as dried leaves or fallen trees, dead insects, rotting fruit, etc. Also look for signs of "arising" such as buds, new young leaves, seedling trees, etc. And, finally, look for indications of "existing" with regular trees, flowers blooming, insects crawling, etc. It may be possible to find all of these signs of impermanence on the same tree.

Outside a natural area, observe artificial indications such as roads, electric overland cables, logging sites, dams, and other changes brought about by humankind. What impacts have these changes had on the land? Inside the natural area, observe signs or impacts of human beings such as trees that might have been illegally cut, littering, pithed or burned out trees. Discuss in the group how these different signs or indications of impermanence affect your emotions and thoughts.

Observing Nature:

Observation of nature is a tool of acceptance. To observe is to think, feel, taste, smell, hear and see without attachment or judgement. Observe whatever information your senses offer. If your mind judges or evaluates, observe that. Don't get involved with the thoughts or try to change them. Just observe them. We understand by doing. After fifteen or so minutes of observation, you may begin to notice the part of you that's observing. Give yourself time in which you will not be disturbed. Decide for that time to do nothing but observe. Sit or lie comfortably. Be still and be.

The mind will present some good ideas to do something else. Do nothing with these ideas—simply observe them. Emotions will want something more exciting. Do not fulfill them. Observe them. The body will demand attention. Do not attend to it. Observe its demands. Notice how ideas, feelings, and body demands are impermanent and changing in form and intensity-just as nature is always changing.

If you ache to change positions, do not. Just observe the desire to change positions. If you itch, do not scratch. Observe the itch. Your mind, body, and emotions may become agitated. Observe the agitation. You gain authority over them by doing nothing, by simply observing.

You can extend sitting observation to moving or walking observation. As you move through nature, observe everything. Observe your reactions to everything. Observation is a basic tool of awareness. The more you observe what you are normally unconscious of, the more conscious

you become. (Roger and McWilliams, l990). Thus, you will notice the small, dead leaf on the trail, the orange brown butterfly on the tree trunk, the different colors of green in tree leaves, the small bird flitting through a distant canopy, and other of nature's phenomena and impermanence by really observing and becoming aware and conscious of nature.

Looking for the elements:

Acknowledge in your surrounding environment the different manifestations of the four basic elements with their corresponding qualities: earth (solidity), water (fluidity/coercion), fire (temperature), and air (motion).

I see a thing . . .

This game can be carried out while walking or sitting while outdoors. One of the participants chooses one object in the surrounding environment and says: "I see a thing and it is. . . .(e.g., green, round, long, making a sound, etc.) Now the other participants can ask for more characteristics which are answered only with yes or no. The participants have to guess what the object is and the one who guesses can select the next object.

GUIDED MEDITATIONS TO TRACE OUR ECOLOGICAL/HISTORICAL ROOTS

There is an "observer" in all of us. We will use this observer in this exercise to connect us to the universe and to "all of our relations," as the Native Americans expressed it, so that we can better experience and understand our ecological history and roots from a Deep Ecology perspective.

Close your eyes. Take ten deep breaths, mindfully breathing in and out. Keep your body relaxed and let your observer go back slowly through your personal history, not just your own actions and big events in your life, but also the story of your whole being, how your body has changed, how your character and personality have developed and evolved in your personal history.

Observe your history, yesterday, last week, last year, back to your childhood.
Remember your birth—and then the time in your mother's womb.

Now meditate on your history as it was told in the lives of your parents and grandparents—and all the great great grandparents. Consider how many grandparents have contributed to your genetic history. With your observer, pick out what characteristics you see in yourself. Choose one of your grandparents as a guide if you wish. Speak to them.

Going back 15 generations, about 400 years, your direct ancestors number about 32,000. Go back another 15 generations to the Middle Ages and your lineage expands to relate to the entire population of Asia, or Europe, if that's where your roots are. These people are survivors. They have come through plagues, wars, invasions, earthquakes, great floods and fires.

Now zoom back several thousand years to about 8000 B.C. at the beginning of agriculture and sedentary village and city life. Join your family as they learn to plant seeds, domesticate animals, and trade. Consider and regard the night sky through their eyes.

Continue your journey back through the thousands of years humanity lived peacefully as hunter-gatherers, and again consider the night sky and the powerful earth forces that shaped your dreams and the way you relate to the world.

Now go back to the dawn of our species when we were emerging as tool making, communicating, loving creatures.

And even before when our history fades into the millions of years of evolution from single-celled life to complex, beautiful forms such as dinosaurs, giant tigers, and dolphins.

And still go back even before life began on earth, when the atoms that compose our bodies were being transformed by the earth's physical processes.

We were present at the birth of the earth as our sun and the solar system were formed from stardust as it exploded and whirled through the cosmos.

We were present at the beginning when the cosmos was a point of energy responding to the "I Am" of the Creator. Rest here at the point of the beginning let the story find its source at the center of your being.

Now begin at the beginning and dream your history forward to the present. Remember, the stars and galaxies that formed the building blocks of your; body the supernova that gave birth to our sun and solar system; the earth that gathered stardust and processed it into living matter; the air, fire, water, and earth that transforms all things and are the basic elements for all things. Your story is shared by myriad animals, the two-legged ones that represent your species, the birds, the fishes, the creeping and crawling creatures, all living things that have been in your ecological and historical roots.

Come back and slowly gather your ancestors, thanking them for their contribution to the unique manifestation of the cosmic story that is yourself. Place this history at the center of your being as a sacred treasure.

Come back now to the present and those who are gathered around you. Become more aware of your breathing as you mindfully take ten deep breaths and then open your eyes. When you are ready, you can get up. (adapted from Kirsch, n.d.)

RITUALISTIC EXPERIENCES:

> *The sacredness of the earth not only calls us to ecological consciousness, it calls us to perform rituals that honor that sacredness. Through such rituals we place ourselves within*

The earth community and, at the same time, bring to it the unique gift which we as humans have to offer, self-reflective celebration. The creation ritual is a response to the affection nature bestows on us. (Kirsch, 1988)

THE TEN-STEP DEEP EVOLUTION METHOD

1. Begin with yourself today. Examine the many non-self elements that have combined to make you what you are today. Contemplate the many people, the places, and the events that have shaped your life and brought you here to this meditation tonight.

2. Go back to your birth, the day that convention says your life began. However, you were already a fully formed human infant at birth. You had existed in your mother's womb for seven to nine months before your birth. Go back to the moment that a sperm from your father entered an egg from your mother to create your unique genetic constitution, the information that makes you what you are today: your sex, your eye color, your height and weight, and many of your behaviors. Contemplate the conditions existing when you were conceived and when you were born. Consider the lives of your parents. Who were they? Where did they live? How did they live? What were their greatest joys? What were their greatest sorrows?

3. If we look a little deeper, we can see the egg and sperm that joined to create your genetic constitution had already existed for a long time before they joined together. We know from biology that the egg your mother contributed had already divide to determine which genes she would pass on to you while your mother was still a fetus inside her mother. Consider the time of the birth of your parents. Contemplate their parents, your four grandparents. Who were they? Where did they live? How did they live? What were their greatest joys? What were their greatest sorrows?

4. Continue looking deeper into your origins. Go back in time 1,000 years, approximately thirty to forty generations. One thousand years ago you had millions of ancestors. The genes present in every cell of your body tonight were then shared among those millions of ancestors; they were spread out around the world, in Europe, Asia, North America, Africa. Who were they? Where did they live? How did they live? What were their greatest joys? What were their greatest sorrows?

5. Go back to 100,000 years ago. You then had uncounted ancestors. They were humans physically similar to us today, but separated by evolutionary change over many generations. Your many ancestors then lived in Africa, Europe, and Asia. Who were they? Where did they live? How did they live? What were their greatest joys? What were their greatest sorrows?

6. A million years ago. All your ancestors were in Africa. They were primitive humans who possessed the first awakenings of human awareness. Look out over the African savanna; you

were there, in the form of your ancestors. Who were they? Where did they live? How did they live? What were their greatest joys? What were their greatest sorrows?

7. Ten million years ago, before the time of humans. Our ancestral stream has now been joined by the ancestors of our closest relatives: chimps, gorillas, and orangs. Our journey backwards through our ancestral stream has brought us back to a primitive ape in central Africa. It is more and more difficult to see ourselves in our distant ancestors, but continue. Who were they? Where did they live? How did they live? What were their greatest joys? What were their greatest sorrows?

8. One hundred million years ago. The world is a very different place. We would not even recognize the continents if we could look at the earth of 100,000,000 years ago from outer space. Dinosaurs were common in Montana and around the world at that time. Our ancestors were a small species of primitive mammal. They had hair, our five digits, and our breasts. We have now been joined by all living mammals in our journey in our ancestral stream. Who were they? Where did they live? How did they live? What were their greatest joys? What were their greatest sorrows?

9. One billion years ago. We have now been joined by all the living species that we recognize in our daily lives in our ancestral journey. We are the wolf, the bear, the whale, the salmon, the pine tree, the flowers on the altar. Our ancestors are simple one-cell organisms living in the warm waters of the primitive earth. Who were they? Where did they live? How did they live? What were their greatest joys? What were their greatest sorrows?

10. The last step in our journey: 3.8 billion years ago. There are no signs of living organisms here. The stream of ancestors that we have been following has ended in a series of complex chemical reactions in which non-living elements are becoming the simplest of possible living organisms. Our ancestors: Who were they? Where did they live? How did they live? What were their greatest joys? What were their greatest sorrows? (Allendorf, 1997)

> When we want to understand something, we cannot just stand outside and observe it. We have to enter deeply into it and be one with it in order to really understand. If we want to understand a person, we have to feel his feelings, suffer his sufferings, and enjoy his joy. The word comprehend is made up of the Latin roots cum, which means with, and prehendere, which means to grasp it or to pick it up. To comprehend something means to pick it up and be one with it. There is no other way to understand something. In Buddhism, we call this kind of understanding "non-duality." Not two.
> (Thich Nhat Hanh, 1992)

Rituals

One of the prices that modern civilization is presently paying is alienation from the wonders of nature and its laws. Civilization seems to go hand in hand with a continuous process of separating the individual from the whole. While aiming at promoting and satisfying people's personal desires, science isolates us from nature. Most research focuses upon exploitation of natural resources. Nature is judged by its usefulness in gaining power, wealth or fame. Little thought is given to how we might *give back* to nature.

Many people express a deep feeling of loneliness and loss within, a kind of loss that cannot be satisfied with more materialistic gain. The high suicide rates and violence in developing and developed societies may be an indication of this loneliness and loss of universal identity.

The playful character of the following rituals and games, some of which are adaptations from native rites, have proven a powerful way of helping people to actually feel what otherwise would have been intellectual understanding only. The latter generally provides little to awaken people's awareness to their habitual separation from their environment.

THE COUNCIL OF ALL BEINGS (Note: much of the following discussion is adapted from John Seed, *Thinking Like a Mountain*, [New Society Publishing, 1988] with permission of the author).

"The shaman speaks for wild animals, the spirits of plants, the spirits of mountains, of watersheds. He or she sings for them. They sing through her. . . . " (Snyder, 1977)

The first Council of All Beings workshop occurred in March, 1985, just outside of Sydney, Australia. Forty people participated in this workshop, led by Buddhists John Seed, Joanna Macy and Pat Fleming. Inspired by the writings of Arne Naess, Professor Emeritus of Philosophy at Oslo University, the three initiators had long tried to create an experience that would incorporate the inevitable feelings of sadness, regret, or remorse when facing the environmental crisis, with a deep ecological and spiritual connection with all life. The Council of All Beings was created to help people establish a sense of responsibility for the earth on the basis of understanding and compassion. Seed says: "It is a form which permits us to experience consciously both pain and the power of our interconnectedness with all life." (Seed, 1988)

Seed continues,

> In the Council of All Beings, we channel the energies released by despair and empowerment and other rituals into facilitating a profound change to deeply ecological awareness. In our experience, "affective education" learning from the heart and body, and the Council of All Beings is just one example-goes much deeper than the exchange of ideas because it is based on the premise that we already possess within us the knowledge we need, and what is necessary is to bring it to conscious awareness.
>
> The knowledge we require is embedded within us and needs to be awakened. In our mother's womb, our embryonic bodies recapitulate the evolution of cellular

> life on Earth. We can begin to feel the inner body-sense of amphibian, reptilian, and lower mammal because these earlier stages of our life are literally part of the ontogenetic development of our neurological system . . . if we wish to reunite with nature, the first requirement is that we have the intention to establish this contact. (Seed, l988)

The Council of All Beings, the way it is adapted here, is based on the book *Thinking like a Mountain*, which was written by the above initiators of the workshops. They have led and now lead workshops for a growing number of followers from all over the world where numerous Councils of All Beings have been established.

Conducting a Council of All Beings can be a spontaneous outdoor or indoor activity or it can be planned and conducted in detail in advance. Educators who would like to organize such a council for the first time are advised to plan some time in advance. Information on council workshops can be obtained by contacting Dr. John Seed, Director, Rainforest Information Centre, P.O. Box 368, Lismore, New South Wales, 2480, Australia. Tel. 066-2l8505.

Seed introduces: "In the Council of All Beings workshops, we participate in a series of processes that weave together three important themes: mourning, remembering and speaking from the perspective of other life-forms." (Seed, 1988)

The Councils are held in three phases:

1. Preliminary exercise of acknowledging negativity, emotions, mourning, despair, care and love for the environment and remembering the evolutionary roots of all human existence.

2. Council of Beings meeting, where all participants have the opportunity to speak out for a particular non-human being, such as a mountain, tree, fish, bear, endangered species, grass, lake, soil, rock, etc.

3. Evaluation of the experience and commitment to active personal care in some area of environmental protection.

1. Acknowledging/Mourning/Remembering

Looking at the speed at which whole species on earth are disappearing raises a lot of sadness, rage, feelings of helplessness and weakness in many people. These feelings are often suppressed for "fear of experiencing the despair that such information provokes." (Seed, 1988).

The Council of All Beings aims at providing safe surroundings in order for people to confront these feelings of despair, grief, anger or helplessness. Through finding ways of expressing and sharing their emotions, many people feel refreshed and reconfirmed in their care for the Earth and wish to participate in programs to solve global problems. Seed says: " Often after such experiences, people come together to form ongoing support groups or join existing groups to take action on peace and/or environmental issues." (Seed, 1988)

" The first step in despair work is to disabuse ourselves of the notion that grief for our world is morbid. To experience anguish and anxiety in the face of the perils that threaten us is a healthy reaction. Far from being crazy, this pain is a testimony to the unity of life, the deep interconnections that relate us to all beings." (Macy, 1991)

There might be some preliminary sharing of emotions, impressions, and perceptions about nature before the actual council starts. They may consist of exercises like:

Sharing Sadness:

The whole group sits together in a circle. Every participant has the chance to talk for a few minutes about a certain sad experience of nature's destruction. No comments are made by listening participants. The meaning of this exercise is to recognize those feelings, that some people have never allowed themselves to express, listening, and to becoming aware that others have similar feelings.

Sharing Joy:

The group sits in a circle. Every participant can talk for a few minutes about joyful moments of interconnectedness with nature. No comments are made by those who listen.

Remembering:

The group sits in a circle. Through guided of all life on earth. visualizing themselves as algae, then slowly climbing up the ladder of evolutionary development, the participants are led through existence as snails, worms, insects to fish, amphibians, mammals, apes to human beings.

These exercises serve as an example and are unlimited in design or structure. Yet at this stage the participants should have enough emotional space for grief, anger or sadness to be expressed, as underlying these emotions they will discover their deep sense of caring: "One by one, people bring forward a stone or twig or flower and, laying it in the center, name what it represents for them—something disappearing from their lives, the meadow becoming a shopping mall, a paved-over creek, safe food . . . And in the ritual naming of these losses, we retrieve our capacity to care." (Macy, 1991)

2. Council of All Beings: Speaking for another Life Form Ritual

For the ritual of the Council, a quiet pleasant environment should be chosen, preferably in a forest, near a lake, or in the mountains. The evening hours by a campfire or in candlelight may help create an intimate atmosphere of mutual trust and openness.

To support imagination, a simple mask may be worn by the speaker. The participants can easily make them beforehand out of forest materials like leaves, twigs and dead tree bark or cardboard and colored paper with a stick to hold it in front of the face or a rubber band to fasten

it around the head. The leader may begin the ritual through playing a drum, introducing and explaining the general structure. Trays with the four elements may be passed around the circle to remind the participants of the basic elements of which all life on earth consists:

-soil or certain minerals representing 'solidity'.
-water representing 'fluidity'.
-a burning candle representing 'heat'.
-incense representing 'motion'.

The four directions may be addressed by the leader while the participants turn their bodies to the directions accordingly: East, South, West and North.

The Council culminates in shedding of one's human dignity and speaking from the perspective of another life form. Before the Council meeting, one takes time alone to be chosen by a plant, animal, or landscape feature that one will represent at the Council. Seed suggests, "Find a place that feels special to you and simply be there, still and waiting. Let another life form occur to you, one for whom you will speak at this afternoon's Council of All Beings. No need to try to make this happen. Just relax and let yourself be chosen by the life form that wishes to speak through you. It could be a form of plant or animal life, or an ecological feature like a piece of land or a body of water. Often the first that occurs to you is what is right for you at this gathering." (Seed, l988).

Spontaneous expression flows through the structure created for the ritual councils and creative suggestions for human action may emerge. Invocation of powers and knowledge of these other life forms also empowers us.

The participants then put on their masks (if appropriate) and following the circle everybody introduces the being they are going to speak out for:

"I am a mountain, I am speaking for all the peaks of the world."
"I am an elephant, I speak for all elephants in the jungles."
"I am a leaf, I speak for all leaves of the forests."
"I am a squirrel, I speak for all squirrels in the world."

Then, starting the circle again, the beings have the chance to tell their story. For example:

> "I am an elephant. I am a strong animal; I am tall and full of strength. I live with my herd in the jungle and we travel from water hole to waterhole to drink and bathe to take the insects out of our skins. We have lived in this area for ages and no other being has ever encroached upon the lands we inhabit. But lately the forest is getting smaller and we often hear from our hiding places the chain saws and the screams of the old trees falling which grew from the bones of our ancestors. Streets have been cut through our habitat and we cannot reach water holes in the far distance when closer ones dried out. Our home is this shrinking forest, there is nowhere else we can go. . . . "

The group acknowledges: “We hear you, elephant.”

> “I am a Redwood tree. I am as older than the history of Buddhism as the first council took place when I already spread my leaves. Generations of humans and animals sought shelter in my shade and I exhaled my oxygen for Jesus Christ, Columbus, Napoleon, Martin Luther King and Marie Curie. I withstood storms and rains over the centuries, but I cannot withstand the machines people use to cut my trunk to make paper bags and chopsticks out of my wood. I ask myself what went wrong with the humans that they have so little reverence for our old age and for all we contribute to their well-being.”

The group acknowledges: “We hear you, redwood tree.”

After some non-human beings have spoken, they turn back into human beings to listen to what the other non-human beings have to say. In similar fashion, everyone in the circle speaks out for a non-human being and then later listens as a human being for some time. The humans may sit in the center of the circle for their listening.

The council may be continued by the humans addressing the non-human beings, expressing their impressions about what they had to listen to. For example, “We hear you, fellow beings. It has been very painful to hear, but we thank you for your honesty. We see what were destroying, we’re in trouble and we’re scared. What we’ve let loose upon the world has such momentum, we feel overwhelmed. Don’t leave us alone—we need your help, and for your own survival too. Are there powers and strengths you can share with us in this hard time?”

Thus the humans may ask the non-human beings to share their strength with the humans in order to find ways to overcome the weaknesses, guilt, and shortcomings the humans felt. The non-humans take up their masks again:

“I, the eagle, offer you my far-seeing eyes to understand what effects your present actions may yield.”

“I, the weed, offer you our power as weeds-that of tenacity. We keep on growing wherever we are. This is what we share with you-our persistence.”

“I, rainforest, offer you my powers in creating balance and harmony that enable many life-forms to live together. Out of this balance and symbiosis new, diverse life can spring. This I can offer you.” (Seed, 1988)

Every non-human being who has offered its gift, joins the human beings again in the center of the circle.

“While the opening of the ritual is preplanned, the nature of its ending can never be foreseen. How it concludes depends on the mood of the group and the dynamics unleashed.”(Seed, 1988)

Accordingly, the Council may end in silence or with chanting or singing. Later on, the group may wish to release the non-human beings that they had spoken for through burning the masks in a fire. As the participants, one by one, step to the center of the circle, they may thank the non-human being they had embodied while placing the mask on the pyre or in the fire.

BURNING RITUAL FOR HANG-UPS, SHORTCOMINGS, AND ECOLOGICAL DEFILEMENTS:

As water is associated with purifying properties, fire is associated with the transformation from one aggregate to another. Fire is commonly used to address the spiritual world by all religions of the world. The Catholic church's burning of frankincense, Chinese ancestor-worshipers burning paper money for their deceased and, again, the burning of incense in Hinduism, Taoism, and Buddhism, as an offering to the spiritual world, are but a few examples. Most societies cremate their dead. In many parts of the world where strong seasonal changes occur in nature, ritualistic fires are lighted in spring as a symbol for the burning of the old year. There is something refreshing, invigorating, and transforming in watching a fire eating away the old, the outworn.

In the Burning of shortcomings and hang-ups ritual, this transforming property is addressed to convert the feelings of negativity, helplessness, depression, sadness, of one's own ignorance and exploitative behavior, into awareness, compassion and active care for the environment and all living beings. In short, it is a rite to remove one's egocentric attitudes and problems that interfere with one's environmental work and to change them to ecocentric attitudes and approaches through confession and the flames of purification.

For Buddhists the concepts and images of ignorance, defilements, or delusions might be evoked and burned. They can be replaced by awareness, ethical behavior, and wisdom for a better life and environmental work.

Again, the group of participants may sit in a circle around a fire. (It is interesting that American Indians always form circles during important ceremonies or rituals; a circle is believed to contain spirit and power and to be interconnected and non-ending.) If space or ground does not permit a fire, a large candle safely placed on a big plate or tray may serve the purpose.

Every participant now takes out a sheet of paper and, in silence, all participants write down aspects of their character, patterns of behavior, negative feelings, short-comings and hang-ups that they would like to change in terms of their lives and in terms of their environmental work, i.e., things or problems that are interfering or reducing their effectiveness in life and environment.

Each one may then individually read aloud what they have written and then burn the paper to ashes, committing themselves to work towards letting go defilement, hang-ups, and shortcomings and toward working on higher goals for themselves and the environment. However, if participants would like to keep the contents of their paper to themselves, they may burn it in silence.

This ritual may be followed by a silent meditation, a prayer, or some chanting.

TREE TALES OF BUDDHA FROM ASIA

While studying Buddhism in Asia over the past dozen years, I noticed that there were a number of stories about Buddha and his relationship to trees and forests. I was impressed with how many Buddhist monks, nuns, and lay people were very concerned about the forest; they would often relate stories about Buddha, trees, and the forest to me. This was particularly true at the various Buddhist Forest Monasteries where I would sometimes stay on meditation retreats, including Wat Suan Mokkh in Thailand. Some of these stories relate to Deep Ecology and change and are presented here.

The following are tales are adapted from the above experiences, the Jataka Tales and from Professor Chaetsumarm Kabilsvak who is the chairman of the Education Committee of the World Fellowship of Buddhism, Bangkok, Thailand.

(1) "A DOVE IN THE FOREST," (ADAPTED FROM THE JATAKA TALES IN WHICH BUDDHA WOULD OFTEN TAKE THE FORM OF AN ANIMAL IN HIS PAST LIVES):

A long time ago, there was a thick forest. Trees were fresh and deep. The air was crystal clear. It was sending echoes of birds singing a beautiful melody, enchanting comfortable life there. The sky was so blue and open. The forest was full of grace, hope and peace. In this forest, there were thousands and thousands of creatures living together as one in harmony with nature.

One day, a dove flew out of the forest to look for food for its babies. When she returned, the dove saw a big fire rising up in the forest! All the living creatures, including birds, animals, plants, and flowers were trying to escape, desperately crying for help in this terrible disaster.

The dove was astonished to see this happening, yet had no time to think. She immediately flew off to a lake far away. When the dove arrived at the lake, she jumped into the water and had its body completely soaked. The dove flew up again and hurried to the burning forest. Flying back to where the fire was blazing briskly, the dove shook its body and dropped a few portions of water. Then she took off on a long flight to get to the lake again. In this way, the dove made many trips between the lake and the forest.

The Heaven, upon watching what was happening in the forest on the earth, asked the dove,

"Do you think that you of humble little body can cease the fire with those few shakes of water?"

The dove answered,

"The fire must be ceased as soon as possible. There are my children. There are my fellow creatures. And there is the very forest that nurtures all our lives. Everything is caught in a big fire now. I have to do something. I will continue making trips this way, until I die."

Eventually, the earnest wish and the prayer of this one little dove was taken to the Heaven. A heavy rain was brought to the forest and the fire was ceased. The forest returned to the peaceful, beautiful place that it once was.

(2) "THE BUDDHIST COMMUNITY AND FOREST DWELLING:"

The early Buddhist community was primarily comprised of forest dwellers so the members had to be mindful of the protection of the forest that was their basic abode. In every aspect, a community member had to respect each tree with which they came into contact.

A famous story tells how a Buddhist monk, while making repairs on his place, cut down a tree that was the abode of a deva. Although the deva urged him not to cut the tree, "to make an abode for yourself," the monk went ahead anyway. In doing so, he struck and cut off the arm of the deva's son, who was part of the tree.

When the deva reported this incident to the Buddha, he laid down a rule that forbade community members to destroy any living plant or tree. The story of the deva serves to help people understand that cutting down a tree is a selfish act. It disturbs the peace of others and deprives birds and wildlife of their natural habitat. It is also considered an ungrateful act since monks depend upon trees in their forest dwelling.

(3) "THE FIRST PRECEPT"

Most Buddhists know that the first precept forbids the taking of life. But very few of them may understand that the fundamental concept underlying this concept. This precept, taken literally at its face value, requires the negation of a specific action, namely killing.

However, to really observe this precept naturally and sincerely, one must not only refrain from a particular negative action, but also with intentions. One must be positive in his or her conduct as well. In this sense, the positive action is to protect and preserve living beings, including trees, which involves metta or loving-kindness.

Loving-kindness is based on denial of the ego that is the heart of Buddhism. When a person stops differentiating between themselves and other living beings and recognizes the Oneness of all living being, the practice of loving-kindness will flow without boundaries or limits. This is the true meaning of the First Precept or "Thou shalt not kill."

When loving-kindness is generated, people will extend their field of action to others. This brings about peaceful co-existence, not only to human beings, but also to all living beings, including trees.

(4) "CONSERVATION OF LIVES"

Buddha and Buddhism respect and cherish life in all living forms. Among many of the Buddha's teachings, one of his teachings is:

"He is one who abstains from injury to seed-life and plant-life. . . . Abandoning the taint of ill-will; with heart free from ill-will he abides having regard for the welfare and feeling compassion for every living thing; he cleanses his heart of the taint of ill-will."

(5) "BUDDHIST MONKS AND CONSERVATION"

The Buddha's disciples who were ordained as monks to follow the way to salvation are fully responsible for the protection of nature as witnessed by a system of forest monasteries in Theravada Buddhist countries in general and in Thailand in particular. Trees of all kinds enjoy protection in such monasteries along with birds and wildlife.

In many areas of deforested and degraded lands, forest monasteries provide an oasis of trees and nature. The monks often teach forest and wildlife protection to villagers as part of their efforts for the surrounding forests and protected areas. In numerous instances, Buddhist monks have actually ordained trees as monks so that they might be protected. This ordination ceremony includes placing an orange robe around the tree.

(6) "THE BUDDHIST COMMUNITY AND THE FOREST"

The Buddha emphasized to his disciples the value of living in the forest for newly ordained monks. He called on them to sit at the foot of a tree. The Buddha said he chose to live in the forest in order to imitate what he saw (including impermanence of rising and falling away) and be helpful to those who came to him.

In the Rukka Suttra, the Buddha admired those who sat at the foot of trees, who desired seclusion, and who had few needs. These teachings encouraged his disciples to lead a forest life and prevent them from destroying the forest. The appreciation of nature by a Buddhist may signify his attempts to find a place of solitude, meditation, and seclusion to help with his/her practice and to attain liberation (Nibbana). It also constitutes one of the best methods for forest protection that has been offered to the world to bring out the sacredness and spirituality of the forest.

END

ABOUT THE AUTHOR

Daniel H. Henning, Ph.D. is Professor Emeritus of Political Science and Environmental Affairs and Distinguished Scholar Professor, Montana State University, Billings and Visiting Professor, Flathead Lake Biological Research Station, University of Montana. A past Senior Fulbright Research Scholar for South East Asia (tropical forests), he has presented a number of environmental papers at international conferences and meetings in Asia and Europe and has written numerous books and articles in the environmental field, including MANAGING THE ENVIRONMENTAL CRISIS (Duke University Press, 1999), BUDDHISM AND DEEP ECOLOGY (2001) and TREE TALK AND TALES.

He is the recipient of numerous honors and travel awards from the Smithsonian Institution (India); National Science Foundation (Malaysia and India); National Academy of Science Inter-Academy Exchange For Visiting Scientist (Czechoslovakia); Albert Einstein World Science Award Interdisciplinary Committee; Resources For the Future Fellowship; Ernest Swift Memorial Fellowship, National Wildlife Federation; Norwegian Marshall Fund Fellowship; World Who's Who in the World Environment; Outstanding Educators of America; Vice Chancellor's Faculty Award, Chinese University of Hong Kong; etc.

He has served on the World Conservation Union (IUCN) Commission on Education and Training and on their International Council of Environmental Law. Dr. Henning has chaired environmental training sessions for the American Society for Public Administration and is a member of the International Society of Tropical Foresters, the International Society for Tropical Ecology (India), the Sierra Club, Audubon Society, Natural Resources Defense Council, Alliance for the Wild Rockies, Friends of the Wild Swan, Native Forest Network, Earth Island Institute, and Natural Resources Defense Council.

Professor Henning has served as a park ranger naturalist in Glacier, Yellowstone, and Rocky Mountain National Parks and as a wilderness ranger in western national forests. Over the past twelve years, he has worked as a protected area/biodiversity consultant and trainer for the United Nations in Asia, including Cambodia, Thailand, and Myanmar (Burma), and also Norwegian and Australian National Parks. This experience included studying and working with Buddhism, Deep Ecology, and tropical forests in Asia and often living in Buddhist Forest Monasteries, including his being an ordained Buddhist Monk in Myanmar (Burma). He has completed a UNEP study on the ecological, forest, and environmental teachings of Buddha and was invited by H.H. The Dalai Lama to participate in the Ecological Responsibility Conference in India.

In his travels, Dr. Henning has conducted numerous presentations and workshops about forests, biodiversity, Buddhism, Deep Ecology, and environmental affairs. They included the World Fellowship of Buddhism, the World Wilderness Congress, the University of Oslo, the University of Montana, the American Center of United States Embassy, Myanmar, the University of Forestry, Myanmar, etc. He is currently consulting, conducting workshops and seminars, and doing volunteer work to help bring Buddhism and Deep Ecology into tropical forest protection in Asia during the winters and to protect old growth temperate forests of Montana and the West during his summers in that part of the world, through his life dedication to trees and forests.