

climbing, a sport which has been gaining vastly in popularity, especially since the mid-1980s. There is, understandably, controversy — even violent argument — over the impact which rock-climbing can have on birds of prey, a type of fauna that is already seriously at risk from the presence of pollutants in the food-chains in which they are the last in line. The problem is a comparatively recent one, and only since the 1980s has there been any general awareness of it.

Many raptors nest only on rock faces and have reached the point where it is touch and go if they survive; the Golden Eagle (*Aquila chrysaetos*) and the Peregrine Falcon (*Falco peregrinus*) are two species whose situation in the Alps is particularly precarious.

For six months of the year at least, the raptors frequent the rock-faces only intermittently, but from February to mid-July their habits change: this is the delicate period of reproduction, which begins with mating and the choice of a nesting site, after which the eggs are laid and hatched and the young reared and taught to fly. In summer the birds gradually abandon the rock ledge, although the adults remain in the area while the juveniles move away and select their own breeding areas in the following winter. In the breeding season, any interference can be disastrous; the climber's intrusion has a number of consequences. At first it may prompt the raptor simply to leave the site in question; later the climber's presence may cause it to desert the nest for hours at a stretch or even for good, leaving the egg-clutch unattended and annulling the year's breeding performance. If a human being comes too close while the young are being reared, the mother leaves the nest she was protecting, and periods of prolonged heat or cold can be fatal to the fledglings. If the young are disturbed during the subsequent stage of their development, they become frightened and leave the nest before they have learnt to fly properly, running the risk of falling into a ravine or of being unable to find the nest again. Birds of prey are far from numerous, and occurrences such as these are therefore serious; the main victims in the Alps are the Peregrine Falcon, the Buzzard (*Buteo buteo*), and the Golden Eagle.

It is not easy to post signs on rock faces to forbid access, although some local authorities in areas frequently visited by birds of prey do display their by-laws in this way; but

there is a risk here of providing egg thieves with valuable clues, especially in the case of falcons for which collectors and falconry enthusiasts are willing to pay high prices. The only effective means of protection — outside the protected areas where rock-climbing is strictly forbidden — is to appeal to the climbers' sense of responsibility: it has to be said that in recent years climbers have been willing to show some degree of restraint, and this should increase as the environmental conservation movement grows stronger with more and more pertinent education.

While the adverse effects of rock-climbing are mainly of concern to birds of prey, it must not be forgotten that the integrity of the Alpine environment is also jeopardized by the habit of hammering pegs into cracks in the rock. Where there are several climbing routes of different standards of difficulty on a single rock-face, the rock ends up riddled with holes. This certainly does no good to the natural environment, if only because the wear and tear due to natural erosion is bound to be worsened. A further point to bear in mind is that rock-climbing may also have harmful effects on the homogeneity of ecosystems, on colonies of endangered plant species, and on plant communities.

One variant of the sport which is particularly harmful to the environment is rock-climbing on the glacially-transported boulders that are known as erratics. Very often these blocks still harbour relict Alpine vegetation that originated in the area from which the boulder was carried by the advance of a glacier; this is an important matter at once from a historical and documentary point of view and in terms of plant conservation.

In our endeavour to achieve a society where development and conservation are compatible, scientific studies and research programmes must therefore be launched that will provide a firm foundation on which to base precise rules for the practice of sport in natural surroundings, so as to ensure that the environment does not suffer and that its natural evolution is not jeopardized.

WALTER GIULIANO
ALP
Via Invornio 24/a
I-10146 Turin
Italy.

An Alpine Convention — Solution for an Avalanche of Problems

A seven-nations' treaty to protect the Alps environmentally, economically, and culturally, is expected to enter into force in January 1995.

'The enormous pressure of all-year-round tourism, a rapid increase in trans-alpine road transport of merchandise, the decline of mountain farming, rural exodus, and disappearing or diseased forests, have transformed the Alps into an endangered [superecosystem],' says Dr Marilies Flemming, former Austrian Minister of the Environment. 'We badly need a treaty for the 11 million people who live in the Alps of France, Switzerland, Germany, Austria, Italy, Liechtenstein, and Slovenia, and for the estimated 100–150 million tourists who vacation there every year.'

Three of the seven Alpine states — Austria, Liechtenstein, and Germany — ratified the 'Convention on the Protection of the Alps' earlier this year, France and Slovenia are expected to follow suit within three or four months, while Switzerland and Italy are proceeding more slowly. But in any case, as only three Parliaments need to

ratify the treaty for it to become binding international law, the entry into force is a matter of a few months or perhaps only weeks. The European Union has been active in treaty negotiations and is a signatory to the international agreement.

Usually, a framework convention such as this Alpine treaty requires protocols to put teeth into it, which can take years. But this will not be the case with the Alpine Convention, as five protocols on tourism, traffic, regional planning, the protection of Nature and mountain landscapes, and mountain farming and forestry, are currently being drawn up by Alpine experts from the seven countries.

Convening of 'Conference of the Alps'

On Thursday 22 December this year in Chambéry, France, the Environment Ministers of all seven Alpine countries will convene a 'Conference of the Alps' to consider the above first five protocols and, if all goes well, to sign them. In the manner of the framework treaty, the

protocols will require ratification by three countries to enter into force. It is difficult to predict how long this may take.*

It goes without saying that the treaty and its protocols are binding only for those countries which ratify them. This is why the Alps can be protected from environmental degradation and unsustainable, unaesthetic development only when all seven Alpine countries have ratified the international accords.

Facts and statistics about the Alps — an area that stretches from the French Alps along the Mediterranean Sea for 1,200 kilometres through the prosperous heart of Europe — are apt to be staggering. To begin with, around 90 million tons of merchandise are transported annually over the Alps — mostly in trucks — and by AD 2010 this commercial traffic is predicted to grow by up to 100%.

'Alpine experts strongly favour shifting a high proportion of lorry transport of goods to rail transportation', says Josef Biedermann, the Liechtensteiner President of the International Commission for the Protection of the Alps (CIPRA), 'and the Alpine Convention already makes this point.' CIPRA may legitimately claim credit for a decades-long effort to persuade Alpine governments that they need such a treaty and a united policy for the preservation and sensible development of Europe's largest terrestrial supercomplex.

Importance of Tourism

Alpine tourism (for skiing, mountain climbing, hiking, or just relaxing in the mountain air) is a \$52 thousand million business — estimated to represent one-fourth of the annual turnover of global tourism. It is hardly surprising to learn that more than 50% of the 11 million people who live in the Alps depend directly or indirectly on tourism.

Excluding day-trippers, who are virtually impossible to count, or people just passing through the Alps, very approximately 100 million tourists spend vacations in the Alps annually. Of these, some 75% arrive by car, 60% are overnight or weekend visitors, and 40% are longer-term holidaymakers.

Every year between 150 and 200 million people drive north or south across Alpine passes. This already substantial traffic is expected to increase by 50 to 70% by the year 2010 — only about 15 years off. 'For the first time, the Alpine Convention links the economy, culture, and the environment', says Dr Flemming. 'This calls for a common awareness of the Alps by all people living in this unique region. Overcoming regional, national, linguistic, and cultural, barriers throughout the Alpine arc is of vital importance for the Alpine population.'

The Alps are practically synonymous with skiing. How many kilometres of ski slopes are there in the seven Alpine countries? The answer depends on who you ask: lift operators say 18,000 km, but Nature protection groups estimate it as 40,000.

In 1990 CIPRA counted about 100 golf courses in the

Alps, but in 1992 there were already around 150, and by the end of 1998 the number will probably double to around 300. In spite of the ecological abuses that arise from such activities, the huge number of tourists enjoying the Alps represent an enormous potential of defenders and protectors of the region. 'Up to now, the Alps have not been able to exploit this potential', says Jacques Morier-Genoud, former head of the Swiss League for the Protection of Nature.

Many Controls Needed

In considering how to cope with rapidly-rising numbers of tourists, the increase in commercial transport, and other problems, as well as with the different levels of development of various Alpine regions, the drafters of the treaty and protocols have come up with two overall strategies:

On one hand, they intend to set limits to certain abuses of Nature in order to avoid further damage to the environment and the landscape, and to reduce pollution. Thus they have taken a strong stand against heliskiing, motor sleighs, moto-cross machines, engine-driven cross-country vehicles, and ultra-light planes, and they advocate controls over construction of new roads and tourist infrastructure.

On the other hand these Alpine experts offer guidelines for sensible development, particularly for those regions that are not yet suffering from overdevelopment. But they need a strategy to secure their economic and cultural future, e.g. better public transport facilities, a focus on 'green' and quality tourism, incentives for long-term vacations instead of day visits, the regeneration of water systems, and encouragement of energy-saving technologies.

Revive Alpine Way of Life

The Alps are not 'the playground of Europe', but a civilization and a way of life that has been fashioned over many centuries. The successful implementation of the treaty requires the cooperation of 11 million people living in 5,800 hamlets and villages, towns, and cities, in 43 regions, in taking care of their living environment.

Until recently when developers arrived, mountain farmers were the landscape architects of the Alps. If farming, forestry, and the social tissue of mountain communities, are all to be revitalized, incentives have to be offered to mountain farmers — not just government subsidies, however justified they may be, but practical assistance in developing diversified, original, and economically viable, farming schemes. Through this assistance, the treaty may encourage Alpine farmers to meet the rising demand for all-natural products, such as high-quality cheeses and other dairy products, honey, fruit, and herbs.

ANDREA DALLINGER
Alpenforschungsinstitut CIPRA
Adelgundenstrasse 18
80538 Munich
Germany.

Short Courses on Life-zone Ecology and Tropical Dendrology Offered in English and Spanish

The classification of the Earth's ecosystems and eco-complexes affects almost all ecological and geographical science. Additionally, the identification of plants is closely related to the classification of ecosystems which on land are largely characterized by their plant components. From an academic perspective both subjects are crucial, as

they form the basis for sustainable resource management and biodiversity preservation.

L.R. Holdridge's Life-zone Ecology classification system and Tropical Dendrology (a system to identify forest trees) have been used by scientists and other professionals in the tropics for more than 30 years. Furthermore, based on the Life-zone Ecology system, several sound practical applications have been developed by the Tropical Science Center to be used in rural development, sustainable resource management, watershed management, land-use

(Continued on page 285)

* On the returned corrected proof the Author wrote 'Please note that Austria is presently not willing to sign the 2 protocols 'tourism' and 'transport', as they consider it not restrictive enough! — Ed.