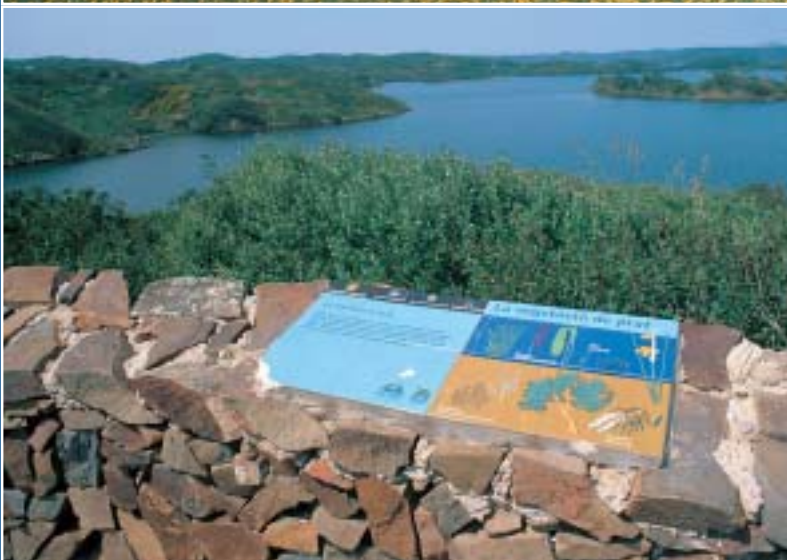


European Models of Good Practice in Protected Areas

Hugh Synge



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Cover photos: (clockwise, from top left) The spectacular landscape of the Hohe Tauern National Park (Austria); chamois atop a crag in the Abruzzo National Park (Italy); the verdant woodland in high summer of the Bialowieza National Park (Poland); and a protected wetland in the Minorca Biosphere Reserve (Spain).
Photos by Hugh Synge except bottom right by Bialowieza National Park

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Preface



The author of this report, Hugh Synge, encourages readers to learn by doing. He has done an excellent job by summarizing best practice in four key areas of the management in four of Europe's high profile protected areas so that all who are involved in management of protected areas in Europe and elsewhere are better informed. Learning from best practice and from how approaches would have been done better in hindsight is always important.

The report focuses on four aspects of management:

- a) **Zoning:** within larger protected areas it is possible to pursue various management objectives in different parts of the area and reconcile potential conflicts through the use of zones. Ensuring that the management of individual zones is compatible with the aims of the protected area as a whole is crucial. Abruzzo National Park in the Apennine Mountains of Italy illustrates how zoning of the area can achieve benefits to all interests.
- b) **Monitoring:** establishing and maintaining monitoring systems of the key features of protected areas is an intrinsic part of management. Without monitoring it is difficult to know whether the aims of the protected area are being achieved in practice. In the Bialowieza National Park in north-east Poland monitoring of the area has been in place for half a century. The system is strongly based on scientific knowledge and is undertaken in a collaborative way with all of the interests.
- c) **Collaborative management:** an important challenge for protected area management is to ensure that local communities and other local interests are fully engaged. As a result, there should be benefits to the protected area and to the social well-being and economic development of the communities. The establishment of the Biosphere Reserve on the whole of the island of Minorca in the Spanish Balearic Islands of the Mediterranean is a good example of best practice in collaborative management.

- d) **Visitor management:** protected areas are important visitor attractions. The challenge for management is to ensure that the natural and cultural qualities of the area are safeguarded and that the enjoyment of visitors is achieved. The Hohe Tauern National Park in the Austrian Alps is an excellent example of how the balance has been achieved and as a result many difficult issues resolved.

I commend this report to all colleagues involved in protected areas in Europe. Hopefully, it will also be of value for those working in other parts of the world. I hope that it will stimulate new approaches and result in improvements in protected area management.

The project was guided by a Steering Committee, consisting of Marija Zupančič-Vičar (former WCPA Vice Chair for Europe), Andrej Sovinc (Slovenia and IUCN), Viktoria Hasler (Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management) and Robert Brunner (Director of the Thayatal National Park, Austria). The Committee developed the criteria on which sites were selected, established contacts with the chosen sites, and commented on drafts of the report.

Thanks to Hugh Synge for his work in bringing the experience on these four topics to a wider audience. Thanks to Grazia Borrini-Feyerabend for her input to the Minorca case study and to Marija Zupančič-Vičar for her contribution to the Hohe Tauern case study.

Thanks to the managers of the protected areas, especially Franco Tassi, Abruzzi, Czesław Okolów, Białowieża, Juan Rita Larrucea, Minorca, and Peter Rupitsch, Hohe Tauern for their support and advice, and for making the opportunity for the project leader to visit their sites.

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*Roger Crofts
IUCN WCPA Regional Vice-Chair Europe*



Introduction

Every protected area, at any given time, has something valuable to offer to others. We can take a snapshot of where each is at and learn from it. Lessons may be about a specific management activity, such as monitoring or zoning, or about an encompassing approach such as co-management. This booklet presents four such snapshots, which will be described and analyzed in some depth in the pages that follow. The four sites selected below were chosen by the WCPA Project Steering Committee to illustrate four particular themes of management practice but there are certainly others that would be equally valid.

The reports on the four sites are presented below as case studies, wherever possible attempting to show their relevance to the wider European context. But of course,

every protected area has to define its own practices that are adapted to the local context. Management practices have to adapt to changing times and circumstances (“adaptive management”). Most protected areas managers will be familiar with the phrase “Learn by doing” and will prefer to develop their management approaches by practical experience rather than reading books and pamphlets. Nevertheless there is value in documenting the experience of protected areas that could be considered seminal on certain topics as a stimulus to debate and thought.

The broad lesson is that there is only one overall recommendation: take on an adaptive management attitude, be responsive and flexible, and learn by doing.

Zoning in the National Park of Abruzzo, Latium and Molise, Italy

Looking across Zone A, the most strictly protected zone, to the valley that runs through the Park.

Zoning is at the heart of the management of many national parks. Indeed, in most parts of the crowded European continent, it is arguable that a large protected area which includes strict protection is only possible through the use of zoning.

This is certainly true in the 50,000-ha Abruzzo National Park, in the Apennine Mountains east of Rome, Italy (its full title today is the National Park of Abruzzo, Latium and Molise). The Park consists of a valley running south-east, with wooded slopes up to high mountain pastures on either side. A main road runs down the valley, with three villages along the road, Pescasseroli, Villetta Barrea and Barrea, and others on nearby bluffs. The area has the highest concentration of endangered species in Italy, and in particular is in the unique position of having viable populations of Apennine wolf, lynx, Marsican brown bear and Abruzzo chamois, as well as a rich alpine flora of some 2,000 species.

The Park was created in the 1920s from a small protected site of 500 ha, and has steadily expanded over the years to its present size. But in the 1960s it had fallen on hard times and was under threat from numerous speculative development projects. An IUCN inspection in 1964 raised the alarm. A team of young people, including Franco Tassi (Park Director from 1969 to 2002) and Fulco Pratesi, came in at this low point of the crisis, and through Italia Nostra prepared the first master plan in 1968. By the end of the 1960s, the idea of

zoning was being considered; by the early 1970s this had crystallized in their wish to stimulate what would now be called ecodevelopment, by making the villages a vital part of the planning process and ensuring the Park would be fruitful for them. This would reverse the decades-old cycle of decline and depopulation.

Franco Tassi argued that the concept of zoning arose simply from the logic of the situation. It would not be practical to close the main road through the valley nor to remove the villages. (Nor would doing so help nature: the brown bears in particular benefit from grazed meadows – without the open areas it would be almost impossible to see them – and the flora is much enriched by traditional non-intensive forms of agriculture and forestry.) Of course, the concept of zoning existed in urban planning, but was much more complicated, and designed for planners rather than public use. The park team wanted a simple system that visitors and residents could easily understand, with clear aims and rules for each zone – free of the impenetrable jargon of the professional planner.

The overall park plan had the aim of reconciling local village plans with conservation of nature. In principle the Park had a higher legal authority, being established by the nation, and so could override the local plans, but it chose not to do so, instead working by consensus. The zoning was therefore done by agreement with the local authorities. Zoning first became effective in 1986 and in the next year the Board of

Part of Zone B,
the General Reserve that
covers most of the Park.



▲ Abruzzo has a rich fauna including chamois (above), wolf, lynx and bear.



◀ The Park has large areas of grassland, as well as forests on the valley sides.

Directors of the Park officially approved the agreements with the villages that had been made, an agreement that was later approved by the relevant ministries in Rome. However, the Park retains the right to override the agreed zonation with stricter limitations where needed. It can also increase the level of protection by indirect means, notably the closing of public roads in sensitive areas.

Rather misleadingly, the diagram on the zoning of Abruzzo reproduced in *Parks for Life* (p. 67) implies the zonation is altitudinal. This is not so: the strictly protected zone is roughly a large transect running perpendicular to the line of the valley, and so includes ecosystems at all altitudes of the Park. Indeed, Tassi is adamant that altitudinal zonation does not work, at least in alpine national parks: the impacts on the higher areas, such as grazing and skiing, have their origins in the villages. If the higher areas alone are protected, the Park finds itself always saying no to requests from the villages, leading to loss of local credibility and political support. It is essential that the villages are part of the whole enterprise, so that park managers can influence village activities and developments so that these are a positive force for conservation.

Abruzzo has four clear and simple zones

Zone A. Integral (meaning Strict) Reserve (presently 6.9% by area). The Park aims to increase this to 14–15%, mainly from Zone B. All of the zone is

owned or leased by the Park, which itself only owns 600ha. Leasing from the village communities has the advantage that the villages then become allies in encouraging central government to fund the Park. At present the rent paid to local villages is ca. € 500,000 per year. In Zone A, access is only permitted by a permit, and then mainly for scientific research. Tourists have to go with a guide, are confined to tracks, and numbers are limited.

Zone B. General Reserve (83.8%). This consists mainly of forests, principally of beech (*Fagus sylvatica*) and meadows. These have been used for centuries, probably millennia, as is apparent from the forest structure. In this zone, the Park permits continuation of traditional activities, such as collecting wood for fuel and crafts, collecting truffles and other fungi for the pot. But park managers specify where the collecting may be done and the levels in each case.

Zone C. Protected Landscape (8.5%). Around the main park village of Pescasseroli is farmland on the flat alluvial area of the valley. This is managed in traditional ways.

Zone D. Development Zone. (0.8%) This is the area of the seven villages in the Park. This is discussed in more detail below.

In effect, the Park completely controls Zone A, is the major player in B and C, but has a minority role in D.



Zone D contains the villages, including Civitella Alfedena and Opi, above.

The buffer zone should also be included here. Abruzzo National Park has grown up over many years and its boundaries are the result of history and opportunity, rather than ecology. A large buffer zone of 60,000 ha was added in 1970, which has a much more ecological outer boundary. The park authority hope that eventually all the buffer zone will be in the Park proper, so making corridors into the wider countryside not just for nature but also for culture and ideas. Since 1988, the Park has legal rights to regulate hunting in the existing buffer zone – vital for a Park in which large mammals are the main attraction.

(It is interesting to note that the zones above do not match the IUCN Protected Area categories, but show a similar gradation in the level of protection. Zone A is intermediate between IUCN Category I and II, Zone B is partly Category IV (managed nature reserve) and partly Category VI (sustainable use reserve). Zone C obviously equates with Category V (Protected Landscape) though the latter are usually much larger. And Zone D is not found in the IUCN system at all.)

Abruzzo National Park is perhaps best known in park circles for its figures on inward investment and for its position as a mechanism for development. In the 1960s the villages were dying, except for Pescasseroli, which was indulging in speculation that proved disastrous for the villagers as house prices rose. Once the houses were built, the new jobs disappeared. There are seven villages inside the Park (with a total of

6000–7000 residents) and another 17 in the buffer zone. Government projects for the Park give employment to nearly 600 local people, a sizeable number in a remote mountain region, again generating local support for the Park, funded by € 15 million of government funds. These include restoring old buildings, improving paths, and providing access for handicapped people. Indeed, some of the first works of the park authority were to convert one building in each village into a museum, most of them dedicated to a single animal. The wolf museum is in Civitella Alfedena, the bear museum in Villavallelonga, and so on. This not only brought benefits to the villages but helped to establish the park authority as the major governmental player in the area. Tassi sees the challenge for parks as how to generate benefits for local communities, not for the urban elites who usually take the lion's share of income from park concessions such as tourist lodges and restaurants.

In Abruzzo, the pressure has come less from ski developments, which in this area are not profitable and bring little benefits to the villages, but from holiday homes – Abruzzo is only two hours' drive from Rome – usually funded from outside the region. The Park has worked hard to prevent building of holiday homes, even destroying one set of illegally built houses. Instead, it has encouraged small-scale indigenous developments for tourism in the villages, through the growth of small hotels, bed and breakfast hostels, local restaurants and the like. The aim is for the villages to



◀ Dense woods, mainly of beech, clothe the valley sides.



▲ Zone C is a small part of the park, containing land farmed in traditional ways.

◀ Inside the traditional village of Opi.

▶ Abruzzo has some of the oldest trees in Italy, some like this one pollarded for centuries.



see the Park as their opportunity for the future; if so the villagers will then be willing to accept controls in other zones. Thus Tassi believes it is essential for the Park to have the so-called development zone, not only the more conventional conservation zones.

Today Abruzzo is seen as a success story, especially in how national parks can reverse the decline in upland village communities. In fact Civitella Alfedena has the highest inward investment rate of any village in Italy, and the largest new building is the bank, where villagers deposit their newly found wealth. Other villages are eager to be included in the Park. Indeed, several other large parks have been created in the Apennines, hoping to repeat the success of Abruzzo, but so far they have not had the strong legislative base or commitment to conservation of nature characterized by Abruzzo.

Lessons

Some clear lessons emerge from the Abruzzo experience:

- Zoning is essential to manage this Park. Without zoning, the Park would today be a few thousand hectares of strictly protected forest, without the dynamic links with the surrounding area. As parks around the world come under more pressure, then zoning becomes even more important as a way to manage them, striking a balance between conser-

vation of nature and meeting local needs and aspirations.

- Zoning gives flexibility. It is much easier to alter the regulation in one part of one zone, or even to alter the zoning map so as to address the grievances of one sector of the population, than to change the park law or protected area boundary. It also makes it possible to gently ratchet up conservation over time without complex legislative change: as the mountain economy shifts from exploitation of natural resources to nature tourism, so it becomes in everyone's interests to increase the level of protection. The intended growth of Zone A from 7 to 15% of the Park is part of this process.
- The inclusion of the village and the road in the Park gives the park authority influence over the whole valley, which is vital for control of the more natural areas.
- Zoning helps the park management to steer visitors away from the most sensitive areas. Tassi found that if they created facilities in 1% of the Park, 90% of the visitors will stay in that 1%. This is a powerful means of protecting the most sensitive areas without forbidding regulations that may be unpopular.
- However, zonation and the encouragement of local ecologically sensitive development do not make for an easy life! The park authority constantly has to



▲ A blue-flowered species of *Eryngium* delights the visitor in spring.



◀ Beech (*Fagus sylvatica*) is one of the characteristic species of the Park.



▶ Well-made signs keep the visitor informed, in this case of a local botanic garden at Villavallelonga.

make difficult and sensitive judgements. Allowing development in one place encourages many more applications from elsewhere. During his time as Director Tassi received over 1000 writs against him and/or the Park, all defended successfully but understandably a great drain on management time and energy.

■ The park authority has to start from a position of strength, not of weakness, if it is to be successful in encouraging and permitting good development and preventing unwise and unsuitable development. This means a strong legislative basis, ideally a national commitment as expressed through national park legislation; this is essential to give independence from local pressures. It also needs a strong management team, and sufficient funds from government. It calls for a skilled and committed leader, who will fight vigorously as the champion for nature but will recognize also the valid needs and aspirations of the people affected by the Park. (The Abruzzo model is clearly very similar to that of the biosphere reserve, but differs from most biosphere reserves in that Abruzzo has a single authority, with a strong government mandate, over the whole area; nor does the zoning correspond with the UNESCO model.)

■ Success also requires a strong commitment to interpretation with a powerful public image, so as to build a constituency for the Park. Abruzzo is particularly impressive in this respect, with a mass of well-designed, colourful leaflets in a range of languages,

for visitors and experts alike, constantly pressing home a consistent message of conservation. The large animals act as ambassadors for the Park and receive the lion's share of the interpretative effort. The Park also has a large team of uniformed rangers and other staff, making its presence felt at all levels.

In conclusion, Abruzzo is a useful model for crowded Europe, especially for other areas of the Alps suffering depopulation (sometimes called desertification). It might also be suitable on Mediterranean islands and in other isolated places where the present way of life is marginal in economic terms. It works to reverse the trend of depopulation, bringing an influx of visitors and money from rich to poor areas. This also has cultural benefits, bringing in new ideas as well as new resources. Zoning is intrinsic to its success.

This report is based on a visit to the Park in August 2001, was written soon afterwards, and reflects the situation at that time. It describes how the Park evolved a zoning system on the ground and some possible lessons from the experience to that point. This was felt to be particularly important for park managers in Europe, where the tradition is more to protect small areas strictly or large areas weakly than to combine both approaches in zoning large areas based on forms of conservation management. The directorship of the Park changed in 2002; the author has not attempted to update the text nor review the position on the ground since then in the light of this change.

Monitoring in the Bialowieza National Park, Poland

Inside the Bialowieza National Park.

Many park experts consider that monitoring inside national parks should be principally to answer management needs, but the experience at Bialowieza National Park points in another direction. A major programme of scientific research and monitoring, some of it dating back 50 years or more, is providing useful insights to basic science and to park management. Perhaps most important, it is an important justification for the Park in the eyes of scientists and policy-makers.

“Europe’s Primeval Forest”

Bialowieza is Poland’s first national park, begun like Abruzzo in the 1920s. Now 10,502 ha in size with a strictly protected core zone of 4,747 ha, it is best known for what is believed to be Europe’s last lowland stand of “primeval forest”. The Park is almost entirely made up of forest of broadleaved and coniferous trees that are both diverse in species and with a wide range of size classes – characteristics of a natural rather than a planted forest. It is home to the last population of European bison, which the park staff saved from extinction, as well as famous predators such as lynx and wolf. Protected first as a Royal and Tsarist hunting ground, spared widespread logging in the 1st World War, and strictly protected since 1921, Bialowieza is the closest Europe may have to a untouched forest with a forest structure and complement of plants and animals almost undisturbed by human activity. It is not surprising that the core zone

is a World Heritage site and the whole Park a biosphere reserve.

The Park was set up because of the scientific importance of the Bialowieza Forest and is run very much on scientific lines. Only a tiny part of the core area is open to tourists, and then only with guides. In fact no more than 20% of the 125,000 visitors to the Park each year actually go into the Forest, crossing a delightful flower meadow before entering through the famous wooden gate. Most of these go round the single rectangular trail by foot but a few enjoy the view from horse-drawn carts or bicycle. They cannot wander freely, partly because there are attractive trails outside the National Park in similar areas of mixed forest.

The Park is only a relatively small part of the Bialowieza forest, which stretches along the border of northern Poland and Belarus. The forest extends 62,500 ha in Poland, and 87,500 ha in Belarus, where it is connected by two spurs to the main mass of Eurasian coniferous forest. In Belarus 15,000 ha have been strictly protected since 1991 as the State National Park “Byelavezhskaya Pushcha”. But this Park in Belarus has to pay its own way. To do this it breeds a great deal of game, organizes commercial hunting and sells wood from the forest. The visitors tend to be rich hunters, mainly from Germany. There are plans to open the border for short (one day) tourist crossings in spring 2005; this will make cooperation between the two park administrations much easier.



▲ Few visitors come in winter, and on some days it is too cold even for staff to work in the forest. The author could take only these two pictures before his camera froze! Above, a sign to the forest.



▲ The historic gate into the strictly protected part of the forest.

Strenuous efforts to extend the National Park over all the Bialowieza forest in Poland have not yet borne fruit. The Polish Government contemplated a large expansion only a few years ago, and went so far as to invest in a massive new set of buildings for the Park, including a very large exhibition space, a lecture theatre and a new headquarters building, but at the last minute, in 2000, changed its mind and left the situation as it was. The forestry lobby is very strong in Poland, reflecting the economic importance of forestry to the country, and it was reported that local communities were not all in support of the park extension fearing loss of livelihoods. However some good has come out of this disappointing result: in 1994 the Ministry of Environment developed a system of forest management (called in English 'Forest Promotional Complex') that is more sustainable than other forms of forestry. State foresters are trying this out in the Bialowieza Forest outside the Park. This experience is being used as a laboratory for making forest management elsewhere in Poland more sustainable. In the year 2004 there are as many as 11 Forest Promotional Complexes scattered across the country.

Certainly the scientific research and monitoring makes it plain that the Park at present is not large enough to conserve viable populations of many of its species, especially the large animals. Polish scientists estimate that 10–15% of the forest outside the Park is natural, in the sense that the trees were never planted and that the trees are of local genotypes. If the Park is not expanded, these will be felled in the next 20 years or

so, adding urgency to the issue. Since the whole area is state property, only the State can decide.

In the area outside the Park, 21 small nature reserves have been created, amounting to c. 3,500 ha in all. In July 2003 the Polish Ministry of Environment established a new 8,500 ha reserve, "The natural forests of the Bialowieza Forest". It covers a large portion of the natural forests outside the Park. Thus there is now a system of nature protection for c. 12,000 ha independent of the Bialowieza National Park.

Research Institutes

Most of the scientific and monitoring work of the Park is carried out by independent research institutes, often of long standing. Bialowieza has interested scientists for over 150 years and the motivation to create the Park was scientific not touristic. Polish scientists consider the forest to be unique in Europe and so of great value for science.

Research in the Park is supervised by the Scientific Council of the Bialowieza National Park. All researchers, including the research institutes, have to apply for permits from the park authority to work there. In general the scientist has to satisfy the park authority that the research will not harm the protection of the forest, does not require a great deal of samples such as plant material to be removed from the forest, and could not be done elsewhere. The authority takes a very



A rich fern flora is characteristic of long-established forest.

conservative line about disturbance that could be caused to the forest; for example it recently forbade new meteorological instruments in the forest because of the need to install a cable. Everything has to be discussed first. At present some 65 research projects are authorized each year, of which 18 are long-term.

The work of three research institutes associated with the Park is outlined below:

Bialowieza Geobotanical Station of Warsaw University

Some 50 years old, the Geobotanical Station – geobotany is the study of plant communities in time and space – mainly studies “vegetation dynamics and plant population dynamics” in the words of its director, Professor J.B. Falinski. It works by studying processes in permanent plots in the forest over a long period and makes extensive use of photography to assess change in the plots. It has around 12 staff, including one post-doc and two PhD students and is responsible for editing the scientific journal *Phytocoenosis*. It has close links with similarly minded scientists across Europe, especially in Italy, France and Germany, giving it a European rather than just a Polish dimension. It is completely independent of the Park and developed simply because of the scientific interest of the forest, not because the Park needed it, but of course it collaborates closely with scientists in the Park.¹

The largest experiment dates back to 1936 and still continues today, an almost unique occurrence in experimental botany. This is the observation of the change in species composition and structure of stands of trees (called “woodstands”). The work is carried out by the Forest Faculty of Warsaw Agricultural University.

The Station has some 180 permanent plots in the forest, not just in the National Park, and 12 of them are monitored every five years. There are also long standing studies of phenology (the time when plants come into leaf, flower and fruit) and of forest colonization from those parts of the district where forest is taking over from grassland or reedbeds. Understanding the processes of the latter is important as in some cases, such as river valleys, it may be better to keep the area open for birds of prey than let succession proceed.

Because the area in the National Park has been protected for a very long time, with no direct human impact, change to it will be from other causes, such as from air pollution, climate change and change in groundwater. Studies of these changes will not only be relevant for understanding other altered ecosystems – the concept of a control plot in the experiment – but, in the opinion of Professor Falinski, may also lead to the development of a general hypothesis of theoretical ecology. He puts great emphasis on the value of what he calls “permanent research”. He argues that it would take 350 years for a forest to

¹ An account of the 40 years’ work by the Station may be found in ‘Vegetation dynamics in temperate lowland primeval forests’, by J.B. Falinski (Junk, 1986).



Fallen trees are allowed to remain in place and rot gradually, providing an important habitat for fungi and invertebrates.

regenerate to a similar stage to that of Białowieża today, and so monitoring is needed for that length of time to understand fully the processes involved. He argues that maintaining the scientific approaches and traditions unchanged is vital in ensuring the measurements are taken in a compatible way over time. But it is proving hard in modern times to continue the great experiments founded by the pioneering scientists many decades ago. Funding is difficult, with resources tending to go to research on animals rather than on plants.

Such a concentrated study of plant communities from a small place and over a very long time, and the immense data sets resulting, are probably unique in Europe. This long-term approach of so-called “permanent research” is sadly neither possible nor fashionable in western Europe, because of the way research grants are awarded, except when it is done by amateurs but they tend to be more interested in species records than in vegetation mapping. Also, botanists in other countries have tended to move away from descriptive studies of vegetation – the phytosociological approach – into other aspects of botany and ecology. So the work and traditions of the Geobotanical Station are truly unique.

Forest Research Institute, Białowieża

This institute was developed in the framework of the National Park, in the 1930s, when the Director of the Park also supervised the work of the institute. It car-

ries out a wide range of monitoring programmes, with emphasis on the chemical aspects of the environment, notably on pollution, changes in species population and in entomology. These studies are part of a national monitoring network and do not have much influence on local sources of pollution, nor on park management. But the work has led to a detailed knowledge of pollution loads within the forest and does feed into forestry management outside the Park.

Sulphur dioxide and nitrous oxides are measured each month at 25 points within the forest. An interesting finding is that the deposition of sulphur in the forest is around 15kg/ha/annum, well above the estimated limit of around 10kg at which damage starts to occur, at least in northeast European ecosystems (although this varies greatly with the soil type). The sulphur is declining very slowly, and a large part of the forest is still threatened by sulphur deposition, notably from space heating and the wood distillation industry in the nearby town of Hajnówka. In contrast the nitrogen deposition is relatively constant, at around 10kg/ha/annum, roughly double the amount at which fertilization effects occur. These high loads, especially of nitrogen, show that deposition occurs in remote areas far from the source of pollution and that man-made processes do influence the forest ecology. The Institute monitors bio-indicators of these loads in 30 different sites, using lichens, scots pine needles, *Vaccinium* leaves and *Sphagnum* moss.



Visitors have to stay on a well-worn track and may not wander off through the protected part of the forest.

The Institute also maintains records for the presence of plants in the forest on both sides of the border, not just in the two National Parks. It has recorded the occurrence of some 1,070 species of vascular plants in 1,066m squares, a study it plans to repeat every 20 years, and has published maps of the species occurrence on the Polish side.

As well as studying flora, the Institute monitors invertebrates. 2–3 plots have been set up in the strict reserve and a few more outside the Park. All invertebrates are caught in traps and all the species determined – new species are found each year! This shows the invertebrate species composition in different habitats and helps park managers to record changes in the fauna.

One key study has been on the controversial spruce bark beetle: foresters traditionally demand all infected trees be felled, even in protected areas, to safeguard forestry areas. However the researchers found equal numbers of beetles migrating in and out of the Park, but that the amount of parasites on the beetles migrating out of the Park was much greater than that migrating inwards. They also found that cutting down the infected trees does not change the speed of infection or the volume of wood attacked. This is providing a powerful argument with which to counter the prevailing wisdom that infected trees be felled; the research could only be done in the National Park because everywhere else the trees were felled first.

Mammal Research Institute, Bialowieza

The Mammal Research Institute, with a team of 15 scientists, is part of the Polish Academy of Sciences, which has a history of nearly 200 years of scientific activities, and has a long tradition of work on bison, small mammals, carnivores and birds of prey. Naturally the reintroduced bison has been a core element of its research, with a unique data series from the beginning. It sees Bialowieza as an ecological reference point for other forest ecosystems in northern Europe. Much of the research undertaken by the Institute has entered the mainstream zoological literature. For example, over 50 years of regular trapping have uncovered a spectacular pattern of rodent biodynamics, which is on a 6–9 year cycle depending on large mast years. The same pattern is then reflected in the population dynamics of their predators such as weasels. This stimulated a whole chain of research across Europe, which found that the seed crops of oaks were synchronized across the continent, from Oxford to Moscow. Similarly, it was found that the abundance of forest birds depended on the snow cover in winter and the caterpillars in summer. More recently they have started monitoring amphibians, finding no serious decline but huge variation in numbers related to the rainfall. All this adds greatly to basic understanding of these animals in natural ecosystems, as well as contributing to park management. The Institute is particularly interested in whether Bialowieza is an isolated genetic island or a pool which was repopulated from elsewhere and can repopulate other areas, a ques-



The forest shows trees in a range of age classes, a sign that it has not been felled.

tion to which genetic studies are contributing. There are also research programmes on wolves, lynxes, badgers, foxes, pine martens, polecats and bats.

A key conclusion from their work, of direct relevance to park planning and management, is that the existing National Park is too small to protect many of its animals. In fact the Institute started campaigning ten years ago to enlarge the Park. Their research points to the need for the whole Bialowieza Forest, in both Poland and Belarus, to be treated as one conservation unit, albeit with different management zones.

On the basis of its research, the Institute also helps lobby on forestry policy, especially on the importance of retaining dead wood in the forest for its associated fauna. The Institute contributes greatly to education – its book on the mammals of Bialowieza is used as a textbook in higher education throughout Poland – and hopes that this will influence future policy towards conservation.

Science and monitoring by the National Park authority

In addition, the Park carries out its own monitoring programmes, which are more directly related to management needs. A small team of three, the Department of Scientific Research, is available to solve particular problems and the Director can call on outside help if need be. Of these, one specializes in the

bison, one is a forester and the other, the leader, specializes in amphibians and reptiles. The team is also responsible for cooperation with outside scientists who wish to work in the Park.

Examples of the work of this team include:

- **Radio-tracking bison and counting them each year.** They then advise on how many to cull each year and other management of the herd.
- **Forestry plots.** Three years ago, the team started to develop a series of long-term plots in the forest to measure the diameter and other characteristics of trees, with the aim of recording events every five years. All trees are measured within a circle of 50m and photographs taken. Data is collected on dead wood and the stage of decomposition measured. The intention is to compare with similar studies from forests managed for tree production. The results will be used to influence management of the forest in the partially protected part of the forest.

The work on invertebrates is leading to a catalogue of fauna, with 11,564 species listed so far. This is highlighting which groups have been least studied. Some 20% of these species depend on dead wood, showing the importance of that element in the ecosystem. Many are very immobile and so may well have died out elsewhere, again justifying the policy of strict protection of the “Primeval Forest”.



Understanding the processes by which a forest maintains itself is at the heart of the scientific research in Bialowieza Forest.



Like other parks, the staff at Bialowieza monitor the visitors, in their case to their Natural History Museum and into the Bison Reserve. Eighty years of trampling is believed to have damaged the soil underneath irreparably, and so based on this research the Park is planning to build a boardwalk over the most frequently used trail.

Lessons

The emphasis on research and monitoring, as the prime rationale for Bialowieza and the main activity there, is in sharp contrast to the approach of most national parks in Europe, for whom balancing conservation with tourism and generating benefits for local people is the main thrust of their work, and for whom research and monitoring are second-order priorities. As "Parks for Life" noted, "monitoring is vital for protected area management, but has proved difficult and is often neglected". At times Bialowieza seems too science-dominated, with its emphasis on the long-accumulated data sets. Maybe tourism rather than research could be the secret to unlocking the park extension that all desire, but nevertheless the Bialowieza experience does teach the great value of involving a wide range of research scientists in the work of a national park.

One important lesson is surely the value of collaboration. A strong point about Bialowieza is that the Park has both its own scientific capacity and close links with the various research institutes, not only those that have placed themselves at its door but also others around the country. If the funding for all this scientific infrastructure can be maintained, this seems to be the best of both worlds. Certainly, delegating science and monitoring to outside bodies would be a mistake, if only because the park authority would not have the expertise to coordinate and evaluate the scientific programmes being undertaken in the Park.

In a sense the programme of scientific research and monitoring – it is hard to distinguish the two – defines Bialowieza as a national park. The little village at its gate is reputed to have eleven professors of various branches of natural history in more or less permanent residence, and some of the experiments go back 50 years or more. Bialowieza was in part first protected to provide a "control" for scientists against which change in other areas could be compared, and this function survives today. Conservation may now be the underlying goal but it is hard to think of Bialowieza without thinking of its myriad fixed plots in the forest, all marked with discrete labels in different ways, and its long history of research and monitoring.



Participatory management in the Minorca Biosphere Reserve, Spain

By Grazia Borrini-Feyerabend, Juan Rita Larrucea² and Hugh Syngé

Raptors soar above the deep gorges of Minorca.

The context

Minorca is one of the four Spanish islands of the Balearics in the western Mediterranean. Some 702km² (70,200ha) in size, it has a gentle undulating landscape with the highest point only 358m and forms a harmonious mixture of natural and man-made landscapes. In 1993, the whole island was designated as a biosphere reserve (BR) by UNESCO, recognizing its natural environment, unique cultural heritage and willingness to embrace sustainable development.

The farmed landscape is a mosaic of grazed meadows rich in wild flowers, enlaced by stone walls and stone-edged waterways. Fingers of grazed land stretch into the wooded hillsides. The relationship between people, landscape and biodiversity is profound. The farmers are, and have been for centuries, the managers of the land. They repair the paths, the waterways, and the stone walls that prevent erosion, they time the grazing of cattle, prevent destructive resource uses, control wild fires and restore degraded meadows. In so doing they maintain the habitat for their cattle, which, in turn, literally create the meadows by grazing out the slower-developing trees and shrubs. In their turn, the meadows allow the wild flora to prosper, maintaining a landscape attractive to tourists and promoting the wealth of the island as a whole. This landscape has remained essentially the same for hundreds of years though the crops grown and types of animals grazed have changed over time.

The natural vegetation that still covers much of the island is maquis and woodland dominated by wild olives (*Olea europaea* ssp. *sylvestris*), holm oak (*Quercus ilex*) and pines (*Pinus halepensis*). Deep gorges leading to the south coast harbour endemic plants on their cliffs and are home to spectacular birds of prey. On the north side the vegetation around the rocky coast is reduced by wind and grazing to garrigue, low spiny shrubs with occasional herbs, mainly endemic to the Balearic Islands. In the north there are also wetlands and salt marshes, notably in the Albufera Nature Park.

Wild flora, avifauna and agro-biodiversity are at the heart of the island's conservation values. Some 90 plant species – 7% of the flora – are endemic to these islands. Variants of fruit trees (apples and plums) are unique to the island. Minorca also has healthy populations of birds of prey, and many endemic beetles (*Coleoptera*) and snails (*Gastropoda*). Endemic lizards populate the off-shore islets. Valuable seabirds with rarities like Audouin's Gull (*Larus audouinii*) and *Puffinus mauretanicus* endemic to the Balearics live in the surrounding sea; their nesting sites are now protected in three Special Protection Areas (SPAs) under the EU Birds Directive. Adjoining and enclosing the SPAs is a large, recently declared marine reserve where fishing and anchorage are controlled by law. The onshore seas have extensive seagrass beds, mainly of *Posidonia oceanica*, whose leaves are washed up in abundance on the beaches – a sign of environmental quality.

² Coordinator of the Minorca Biosphere Reserve until 2004.



▲ The wild carrot (*Daucus carota*), part of the rich plant genetic resources of Minorca.



▲ Wild flowers delight the visitor in spring.



▶ A farmer with his herd of indigenous cows.

The people of Minorca (Menorquins) are hardworking, hospitable, strongly attached to their local history and traditions. During local festivities the whole island becomes alive with traditional music and a local race of horses (wonderful black-coated animals) is exhibited in races, parades, games and pure pleasure runs throughout the narrow streets of every town and village in the island. In all, the local society of about 70,000 residents, mainly in the traditional port and historic harbour of Maó (Mahón) on the east coast and the former island capital of Ciutadella in the west, is rather closely knit, but tourism is rapidly affecting its character.

Minorca is mostly dependent on tourism for its economy but differs from the other Balearic Islands in that the tourism is more restrained, with about 90,000 tourist beds compared with roughly half a million in Majorca. There are several modern tourist centres with hotels and apartments on the coast away from the cities, but most of the coast is still in natural condition. Remarkably, too, there is no coast road around the island.

The main issue facing the island is how far to restrain growth in the number of tourists and urbanization driven by tourism. Some espouse the vision of a diversified economy, dedicated to quality tourism linked to the heritage of the island, one part of which is its sustainable farming practices, but certainly not entirely dependent on tourism. Others believe that tourism needs to be fully developed, that the biosphere reserve label is valuable principally to encourage

tourism and that it should never be used to limit or reduce it. From this perspective, developments that enhance the island's receptivity to tourism, such as water desalination plants and the artificial re-creation of beaches, are welcome despite the possible environmental damage. Local people are well aware of the consequences of taking one or the other path, and activists do not shy from civil disobedience to get their concerns heard.

Also important is the question of agriculture. Between 1956 and 1995, the proportion of the island under extensive agriculture dropped from 61 to 42% of the island, and the extent of abandoned pastures increased from 2 to 16%, while the extent of natural vegetation (excluding the abandoned pastures) has remained at 35%. Both intensification of farming and abandonment of farmed land lead to loss of biodiversity as well as of landscape values, with its potential long-term impact on tourism.

The extent to which a management system is effectively participatory can be assessed by investigating at least three of its components: the process by which it was established and functions, the institutions it develops (organizations and rules of functioning) and the concrete results it achieves (agreements, initiatives, impacts). We will examine these components for the Minorca BR, keeping in mind that there is no universal standard on the matter, and that success is mostly gauged by the fitting to a specific context.



◀ The wild *Gladiolus* grows in corn fields.

▲ Botanist and conservationist Juan Rita Larrucea was Coordinator of the Biosphere Reserve until 2004.

The process

In 1989, the Institut Menorquí de Estudis (IME) invited the Spanish MAB Committee to the island and started discussing the possibility of seeking a BR nomination. The idea was born in a small intellectual milieu (local environmentalists from the university and NGOs, such as the well-known Grup d'Ornitologia Balear i de Defensa de la Naturalesa – GOB), alarmed by the deteriorating quality of the environment and the potential loss of local cultural and natural values. The time, however, was ripe for environmental concerns to spread rapidly to the rest of society. A profound crisis was becoming apparent in the tourism business in the Balearics and many thought that only a better, more environmentally sound approach could succeed in improving the character, quality and sustainability of the pivotal industry on the island.

The local media took on a major role in the process, providing a forum for public discussion with articles, letters and cartoons. For about three years the media regularly vented environmental issues and concerns and the matter of the BR designation was often mentioned. Perhaps not many had a crystal clear picture of what a BR was all about (nor, for that matter, may they have today), but the debates on environmental issues were frequent and spirited. If scepticism was high, so were hopes and expectations.

In 1991 the Parliament Balear approved a protection law, using zoning as a way to solve conflicts between environmentalists and developers. About 40% of Minorca's territory were given a limited form of protection; new construction and infrastructure are not permitted but the regulations do not extend to use issues such as hunting and agricultural practices. The zoning plan was prepared by expert consultants under the supervision of the political authority and was essential for the BR nomination. However, it did not involve the public as much as it could have done.

Importantly, numerous politicians became involved in the environmental debates. It was a period of relative political instability and the Consell Insular changed hands but all political parties basically supported the BR nomination. Whether they did so because they truly embraced the value of sustainability or because they appreciated the "green label" that the BR could bring about may be a matter of speculation. The important fact was that there was a broad and quite effective political consensus on the BR nomination. A number of studies were developed, including a plan to establish Minorca as a biosphere reserve. This was also essential in obtaining the official declaration from UNESCO, which came in 1993. This step both strengthened the environmental concerns of all the island's inhabitants and inaugurated "the environment" as a prominent political issue for the years to come.



◀ The typical landscape of Minorca, a mosaic of fields and wooded hillsides.



▶ Archaeological sites are protected as well as natural areas.

Obtaining the declaration may not have been too onerous, but the difficult part was to make it meaningful and effective. A BR Consortium, uniting all the stakeholder representatives interested in offering support and ideas, was created but was less successful than hoped. Its deliberations – supposed to be by consensus – were blocked by one of the farm-owner associations. In 1995 the Parliament Balear enhanced the biosphere reserve by establishing the Albufera Nature Park of some 1,947 ha, which protects a large lagoon and surrounding hillsides and farmland in the northeast.

In 1997 the Consell Insular commissioned a feasibility study for a Plan for Sustainable Development. This was intended as the main strategic document for the BR, but not many concrete activities started as a result.

In 2000, the Consell Insular established a BR office (Oficina de la Reserva de Biosfera) and appointed a BR Coordinator (Professor Juan Rita Larrucea). Because the geographic jurisdiction of the Consell Insular and the extent of the biosphere reserve coincide, most of the conservation and management functions for the biosphere reserve are carried out by the various departments of the Consell Insular, notably its Environment Department. The Co-ordinator of the Biosphere Reserve is mainly concerned with initiating conservation actions, building environmental awareness, scientific and technical assistance, relations with other biosphere reserves and with UNESCO-MAB, and acting as an environmental advocate.

Also in 2000 the Consell Insular established a Consultative Commission (Comissió Consultiva del Territori i la Reserva de Biosfera). This effectively replaces the earlier consortium and is a formal pluralist advisory body to the decision-makers, expected to meet every two months. Importantly, local society is also being asked to become involved in various informal ways. Workshops on future scenarios for the island, on progress indicators for the biosphere reserve, and on policy options (e.g. on water, agriculture and the harbour) have included citizens, politicians, technical professionals and representatives of local associations and the private sector. There are also innumerable ad-hoc meetings called to develop specific decisions, such as for the management of Albufera des Grau Nature Park. In 2002, management plans were approved for two of the zoned areas and are being prepared for the others. Citizen forums on a local Agenda 21 will soon take place in all municipalities of the island.

A very direct way of participating in managing the BR is for associations and individuals to propose and carry out initiatives that contribute to its objectives. The BR Coordinator is promoting this avenue by inviting the submission of such initiatives and some of those are currently being implemented. They include conserving local fruit tree varieties and local breeds, restoring cultural monuments, studying waste generation patterns and urban mobility, creating microhabitats, cleaning up portions of the seabed, and rebuilding ancient stone paths.

▶ The endangered fern *Marislea strigosa* grows in seasonal pools.



▲ Coastal maquis near Es Freus, north of Port Mahon (Maó).



▶ A seasonal pool above Sa Mesquida, home to rare plants.

Institutions

The institutional context of the Minorca BR is relatively young, lean and still fluid, we could even say experimental. Its main bodies, such as the Oficina and the Comissió Consultiva, are less than two years old. An independent institute in charge of setting up an information system and monitoring key indicators of the BR status and achievements (the Observatori Socioambiental de Menorca) had been created earlier but became operational only in 1999. A strong element of continuity, however, is provided by the Scientific Commission for the Biosphere Reserve, created within the Institut Menorquí de Estudis in the early days of the biosphere reserve. The Commission supervises the Observatori and is active in offering scientific advice. One of the strengths of the institutional system as a whole is the mix of formal and informal avenues of decision-making with a focus on the creation and maintenance of social consensus.

Under the decentralized system of administration in Spain, conservation in Minorca is mainly carried out by the Consell Insular de Menorca (Island Council). The Govern Balear (Government of the Balearics), which is one of the 16 regional governments in Spain, has responsibility for environmental issues but this may be delegated to the Consell Insular in the next few years. In 2002, the Govern Balear, for example, had before it for approval a draft law for the operation of the biosphere reserve. However the day-to-day adminis-

tration of the biosphere reserve is in the hands of the Consell Insular. In Spain the federal government in Madrid is responsible for national parks (none in Minorca), ports, airports and the coastline.

The main groups with distinct interests and concerns regarding the BR include:

- Local associations for environmental protection (usually represented by GOB) and for conservation of the cultural heritage of the island. They are very active and respected in society.
- The agricultural sector, represented by several organizations, not always in agreement among themselves. The organizations include both land-owners and agricultural workers, sharecropping being the main form of production on the island. The main productive activity is raising cattle and diversification of production is less easily accepted than intensification or overall abandonment – in effect production inertia is strong!
- The tourist sector, represented by associations of hotel-owners including multinational and local companies.
- The construction sector, including both local and non-local investors. They do not participate much in the BR discussions.



▲ Like many places in the Mediterranean, Minorca too has its ill-planned and unsightly hotels.

▲ The historic harbour of Port Mahon (Maó).

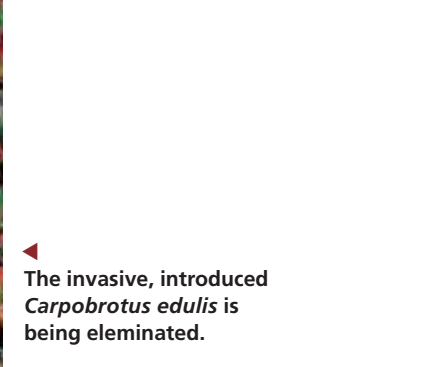
- The political parties with major followings in the island. Some individuals in parties of all leanings embraced the BR cause as key elements in their campaigns.
- The local municipalities represented by their elected mayors. They have important roles in land-use planning, waste and water management.
- Intellectuals and the media, including researchers, professors, journalists, who are generally strongly in favour of environmental initiatives.

Are there bodies and pluralist platforms through which these interest groups can influence decisions in the Minorca BR? Yes, there are, and they comprise both formal and informal organizations. Some formal ones have legal decision-making powers, such as the Junta Rectora of the Park of Albufera des Grau, the Comissió Insular d'Urbanisme or the Comissió de Patrimoni. Others are consultative bodies, such as the Comissió Consultiva or the many ad-hoc groups called to assist in developing solutions to particular issues (e.g. water policy, tourism, the port, etc.). The deliberations of these informal and consultative platforms do not carry legal authority but are important, as it is politically very difficult to go against social legitimacy.

Currently, the Comissió Consultiva is the most important structure allowing for pluralist debate and deliberation on the BR as a whole. It includes representatives of political parties, economic operators (entrepreneurs), workers' unions, the agricultural sector, the Institut Menorqui de Estudis, professional associations, neighbourhood associations, the tourist sector, local associations for the environment and the defence of historic patrimony as well as individuals of local renown and social stature. The secretary is the Coordinator of the BR, the agenda is set by the chair and deliberations are generally by consensus. The President of the Consell Insular selects 5 of the 22 members and chairs the Comissió. In this sense, the political administration of the island appears to consider the Comissió rather highly, while remaining interested in a degree of control over its deliberations.



◀ A path for visitors at the Albufera Natural Park.



◀ The invasive, introduced *Carpobrotus edulis* is being eliminated.



▲ Signing at Albufera Natural Park.

Results

So far, what has the BR achieved for Minorca? Has it promoted public awareness and care, and a desire to conserve the unique wealth of the island deeper than the pronouncement of this or that political administration? Has it fostered new policies and sound, concrete initiatives? Has it helped farmers to remain on the land and continue their extensive production patterns and techniques? Has it helped the island to attract quality-conscious tourists? Has it made more secure the conservation of unique habitats and species? How important in all of this has been the participation of society?

From the experience of its first nine years one is tempted to reply positively. The involvement of civil society since the early discussion about the BR nomination has led to a broad consensus on what are the key economic, environmental and social issues for the island. Out of that, both broad policy decisions and specific initiatives have emerged.

Policy decisions include:

- The establishment of a marine reserve north of Minorca. In fact this is a true example of participatory decision-making, as the GOB association was at the origin of the discussions and agreement among fishermen, scuba operators and other stakeholders

that led to the submission of a specific proposal to the Govern Balear.

- The approval of the land use plan for the whole island (Plan Territorial Insular) – an important juridical instrument for the biosphere reserve. Technical consultants prepared the plan and in 2002 the Comissió was about to start discussing it and proposing changes.
- The development of a specific law for the biosphere reserve, including its management objectives, and accepted environmental principles comprising 20 items. A draft has been drawn and in 2002 a participatory methodology to complete it was under discussion, likely to include a specific workshop.
- Priorities for allocation of the Minorcan share of the innovative ecotax that started in May 2002 of about € 1 per visitor per day; interestingly this will be in the hands of the Comissió Consultiva.

Specific initiatives include:

- Active management decisions for specific environments, such as opening or closing (and at what level) the connection between the wetland and the open sea in the Park of the Albufera del Grau. The Director of the Park calls for ad hoc meetings among the most directly interested individuals and offers a space to vent and

exchange ideas, develop sensible options and obtaining an informed, if not always enthusiastic, agreement on a course of action. These options and agreements are then presented to the Junta Rectora of the Park and usually accepted as they come with the strong recommendation of society.

- Resolutions of specific conflicts, such as about camping and boat anchoring off secluded beaches. The tradition of camping is high in Spain and in Minorca in particular. The BR banned camping in all the protected zones and this was very unpopular. Some ad hoc meetings, however, managed to develop camping regulations accepted by all. Similarly, ad hoc meetings with the participation of all main interested parties managed to draw up a self-regulation agreement, including prescribed ways of anchoring, top number of boats allowed in each beach, banning of loud music and local ceiling to the size and number of boats available for rent. Unfortunately, this example of self-regulation was frustrated by top-down regulations imposed by the Ministry of the Environment.
- Meaningful resolutions to problems, as in the case of the association of car mechanics requesting regulated solutions to the problem of used motor oil and the association of jewellers requesting studies and regulated solutions for the elimination of liquid and solid toxic waste.
- Collaboration among several institutions (municipalities, government departments, NGOs, etc.) to develop and maintain a monitoring and information system for the BR. This is done independently from the BR management body and facilitated by the Observatorio.

In conclusion, a wide range of individuals and organizations have contributed to the development of policies and have taken action themselves, wherever appropriate. This has not only taken forward the BR agenda and generated a variety of environmental gains, but has also benefited society as a whole. Local people are empowered to take on issues and activities much more often than in other parts of the country, and the Consell Insular is making excellent use of the capacities and skills of the whole civil society.

Lessons

The Minorca biosphere reserve is far from a conventional protected area. It covers an entire island, including an international airport, a commercial port and tourist centres as well as towns, villages, roads and other infrastructure. In all, it has more to do with adding sustainability to normal life than with managing a conventional protected area carved out of a wider landscape. In addition assessing the participatory approach for the BR becomes equivalent to assessing the extent to which the administrative setting involves participatory democracy (and not just delegated democracy³). This colours the lessons we can draw from this specific case:

- All governance issues, including governance of protected areas, deal with the interface between legality and legitimacy. What is legal, i.e. established in policies and laws, may or may not coincide with what is broadly accepted in society and thus considered proper and “legitimate”. A participatory management approach is the most powerful way for a protected area to bridge the gap between legality and legitimacy and to assure the sustainability of management decisions and practices.
- A participatory approach commits protected area managers to address wider issues of livelihood and sustainability not just conservation of nature and heritage.
- The larger and more complex the protected area, the more essential a participatory form of management.
- The participatory approach can be pursued by both formal and informal means. Both are valid and both are needed for success. In Minorca the experience with the formal mechanism is limited, but the experience with informal mechanisms is particularly rich.
- A key way of participation is allowing and encouraging people to take action directly. The protected area manager can delegate specific tasks to organizations in civil society, can encourage proposals from civil society through technical support and funding, and can be highly responsive to suggestions and proposals coming from civil society itself.

³ In delegated democracy the citizens are called at fixed intervals to elect some professional politicians to represent their broadly defined interests and concerns. The politicians are assisted by technical experts and only rarely call for the direct opinion of their constituencies on specific issues (e.g. by referendums). In participatory democracy the citizens are often called to influence decisions and actions in a direct way, expressing opinions on specific issues and helping to formulate and support rules, incentives, disincentives and initiatives. It is also rather frequent, and especially so in traditional societies, that participatory decision making is done by consensus, requiring rather long elaboration times but delivering decisions that are usually broadly owned and seen as legitimate. While the first mode is supposed to be more efficient and suited to national contexts and large-scale decisions, the second mode allows making full use of local knowledge, skills and resources and fosters compliance to the agreed rules. If the goal is to set up a sustainable management system for a protected area or a body of natural resources, protected from the vagaries of political change, participatory democracy offers the most promise. In general, however, a society ends up balancing this consideration with others of a economic, socio-cultural and political nature.



▶
**Juan Rita Larrucea,
 Grazia Borrini-
 Feyerabend and
 Hugh Synge
 (from left to right).**

- In Minorca, the decisions that affect the BR are taken by official bodies as an expression of delegated democracy, but as far as possible the options and the technical content of the decisions are developed with the direct input and advice of the relevant stakeholders.
- An independent body, academic or otherwise, that sits outside the decision-making process and provides a memory and overall vision is a valuable addition to the management institutions. In Minorca this role is played by the Scientific Commission for the Biosphere Reserve.
- Ad hoc meetings are a powerful way to explore the issues and give everyone a view of the overall interests and concerns at stake. Such meetings may be relatively informal but they need to be carefully prepared, facilitated and followed up, so as to make sure the time of the participants is not wasted.
- The pluralist bodies that formalize the participatory approach need to be constituted by a careful balance of stakeholder representatives. Each should have a clear constituency to represent and report to. The seeking of consensus is a powerful tool to sustain decisions in the long term.
- A decentralized system of governance embracing the principle of subsidiarity greatly favours a participatory approach in protected area management. This is clearly demonstrated by the case of Spain.
- There is no recipe for participatory management in terms of process, institutions or agreements. To be effective a participatory approach must be tailored to the unique challenges and opportunities of society. But there is accumulated expertise on participatory management and those working for protected areas can benefit from exposure to it and from ongoing exchange of experience with others in similar situations.
- Civil society can best contribute to protected area management when it is internally structured and organized. This is exemplified by the Minorcan society, which is rich in associations, organized groups and vibrant personal relationship. The efforts of individuals are also essential. 'Champions' in civil society and credible and approachable individuals in positions of power are both needed.

Visitor management in the Hohe Tauern National Park, Austria



The spectacular peak of Großglockner.

Tourism is at the heart of most national park strategies. But it brings perils as well as benefits. Visitor management is how the park manager seeks to maximize the benefits and minimize the harm.

Some might be inclined to argue that nature in national parks, especially those designed to be in IUCN Category I or II, would develop best if few visitors came. But this is a mistaken approach: most national parks have recreation as part of the reason why they were created, the word “national” implying they are for the benefit of all the nation. Many, like Abruzzo and Hohe Tauern, are in peripheral regions where life is hard and modern trends such as globalization have brought decline rather than prosperity. To justify their existence and to maintain their political credibility, the parks have to help local people improve their livelihoods. And tourism is nearly always the best way to do this with least damage to nature.

In the heart of the eastern Alps

Hohe Tauern is the largest park in the Alps. Based on initiatives starting in 1971 and with its last extension in 2001, it covers 1,815km², stretching some 100km east-west along the spine of the highest part of the eastern Alps. It is divided over three länder, the decentralized provinces of Austria – Salzburg (805km²), Tyrol (610km²) and Carinthia (400km²) – each of which is responsible for its section of the Park. Austria is possibly the most decentralized country in Europe,

with even national parks fully devolved to the provinces. Leadership of the Park is rotated among the directors of the three sections of the Park, rather like the way the presidency of the EU rotates among its member countries.

The Park covers the peaks and high alpine pastures, with only a small amount of forest. It is one of the great wildernesses of Europe, and noted for its spectacular glaciers. Areas with houses, roads and power lines are strictly excluded from the Park, as are the forested slopes, which in this part of the Alps have to be managed with old trees removed and young ones planted so as to prevent damage by avalanches and landslides into the inhabited villages below. Some 598km² are in an outer zone and the remainder in the core zone. The section in Carinthia achieved official Category II status from IUCN in 2001 and the remainder aspires to this status soon. Although the Park does not formally include the valleys with their wild flower meadows and picturesque villages, as the account below shows the park staff make every effort to make it look and feel as if the valleys are indeed in the Park.

The Park was created as pressure mounted in the 1970s to build hydropower dams and glacier ski resorts in this high part of the Alps. Many villagers, faced with a declining local economy, supported such developments because they thought this would bring money and jobs to the region. Conservationists were appalled and lobbied for a national park. The conservationists won, but it



◀ Hohe Tauern is a Category II site in the UN List of Protected Areas.

▲ National Park displays at the start of a trail near Heiligenblut.

was a hard fight and not all were happy with the outcome. Ever since, the Park has bent over backwards to do what it can to support the local economy, and has worked hard to win acceptance from local people. Nature protection contracts are now one of the main sources of income for farmers, and a mainstay in maintaining the attractive environment of villages and meadows rich in wild flowers in the valleys. Today it seems reasonably accepted that long-term regional prosperity will only be achieved by a policy of conserving the natural beauty of the area and building up high quality, low-impact nature tourism, a point shown by the fact that four more communities want the Park extended to the high alpine zones above them. Park staff are very aware that the region around the Park is a peripheral area in Austria, with little industry and the agriculture heavily dependent on subsidies. They are deeply concerned to avoid the depopulation of other parts of the Alps. So, for the most part, the Park seeks to attract visitors rather than discourage them.

Managing by persuasion

Like many national parks in Europe, Hohe Tauern has to manage its visitors by persuasion and example rather than by law or regulation. There is a long tradition in Austria, enshrined in law from 1921, that people can wander freely above the tree line, and this applies to national parks too. It is also important to remember that the tradition of alpinism is about ten times older than the Park, and so park managers have to tread carefully. Groß-

glockner, at 3,798m the highest peak in Austria, was first climbed in the year 1800 and is the birthplace of alpinism in the eastern Alps. Nor does the Park own much land as some 95% of it is in private hands: in the high alpine areas various alpine clubs own large areas, as well as the famous alpine huts where walkers and climbers can stay overnight.

The approach of the Park is to encourage visitation in certain areas (hotspots) by provision of very good services and hiking on well-managed, long-established trails, so as to remove the likelihood of visitors wandering into fragile and sensitive areas. With such a large park, this is a very achievable approach. Staff have found that without a trail, people wander in all directions, but if there is a clear and unmistakable path, nearly all stick to it.

A good example of the Park's approach is in the valley of Untersulzbachtal south of Neukirchen. The top of the valley is one of the wildest and least changed parts of the Park and is in the highest category of protection. At the bottom, close to a main road, is a waterfall with a short trail and an exhibit on copper-mining. Rangers take visitors along this trail but nothing is said or written to encourage the visitor deep into the valley; and there is no marked trail. It is legally possible to go up the valley but few do so.

In Hohe Tauern, visitation has remained relatively constant. Some, especially in Carinthia, the remotest of



▲
**Marija Zupančič-Vičar and
 Hohe Tauern staff member
 Günter Mussnig at
 Franz-Josefs-Höhe.**

◀
**The famous
 glacier below
 Franz-Josefs-
 Höhe.**

the three provinces, report a fall in visitor numbers, while Salzburg reports a gentle increase. Overnight stays in some of the huts have dropped and only one mountain, the Großglockner itself, can be considered crowded with climbers in the summer season. It is arguable that without the Park alpine tourism would be even further reduced.

The Park is keen to influence the types of visitors who come, so visitor management starts with the promotion of the Park to travel companies and the public. Many visitors, especially elderly ones, come in buses over the Großglockner High Alpine Road, staying in the area just a day and neither contributing to the local economy nor developing more than a superficial appreciation of the Park. Managers are keen instead to encourage longer stays, in particular of families with young children, who can stay in the villages and do some of the trails. This will contribute to the local economy and also build up a constituency of informed supporters, especially among the younger generation. The “young pensioners” of the baby boomer generation – wealthy, fit and environmentally aware – are another target.

One innovative approach is a partnership in Großglockner Destination Management GmbH, a new company which is the official tourist partner of the Park. It offers complete packages for visiting the Park, taking advantage of the facilities of the Park, such as trails, mountain guides and visitor centres, and integrating them into

programmes. The Park provides rangers to guide the groups on the trails; the Company does the marketing and logistics. The Company argues that guided tourism means the Park can absorb many more visitors than it could do otherwise without damage. Indeed, it sees the limiting factor as the number of tourist beds, now declining, rather than nature.

The Park also offers a range of services directly to the public. For an inexpensive € 5.80 the visitor can spend a day with a ranger walking the trails. The Glockner-card is a € 10 season ticket produced in collaboration with the region; it gives discounts on various services and allows the visitor to use the Großglockner High Alpine Road free after the first occasion. There is also a strong youth programme called Project Weeks; by focusing mainly in May, June, September and October, it seeks to extend the season.

The Großglockner High Alpine Road

An extraordinary feat of engineering, the Großglockner High Alpine Road is one of the main visitor ‘hotspots’ of the Park. It runs north-south over the Alps, with stunning views of Großglockner and other peaks. Built in the 1930s to provide jobs and open only from May to October, it is even today one of the most scenic routes in Europe, reaching 2,576m at its highest point. The road is operated by a company that is 70% owned by the State, the rest by the governments of Carinthia and Salzburg. Users pay a toll of € 26 per car, which



▲ Tourists admire the view at the Franz-Josefs-Höhe, the end of the spur from the High Alpine Road.



► Buses at Franz-Josefs-Höhe add to pollution and congestion.

goes to the Finance Ministry, not the Park. Around 900,000 visitors take the Road each year, down from a peak of 1.3 million in the early 1990s.

The park boundary excludes the road and the area close to it but the park authority works closely with the road company to provide interpretation. Stopping places entice the driver to halt, and are enlivened with attractive display panels about the area. Intentionally the information provided is not at a high level; each display tends to concentrate on a few simple topics and often has a beautifully painted panorama. This is the first and only contact of most visitors with the National Park, and great efforts have been made to ensure a good reaction. Several visitor centres provide a more detailed experience. The Alpine House provides models to explain alpine ecology. Like all the visitor centres, panoramas and models of the landscape are a key feature, giving a sense of place – and on days when visibility is only a few metres, as often happens at high altitudes, an idea of what the visitor might see! Ten years ago there was almost no interpretation along the road; now there is so much that it is hard for any visitor not to learn about nature and the Park.

At the top of the road a spur to the west leads to Kaiser-Franz-Josefs-Höhe, which affords spectacular views of the Großglockner peak and of the impressive glacier below. This end-point, however, does have some quite terrible buildings, including a massive multi-storey car park, that it has not yet been possible

to remove or disguise. Here most visitors enjoy the view, take refreshments and buy souvenirs but do not walk far. However, there are some options to encourage them to do more. A trail with steps leads down to the surface of the glacier below. The Gamsgruben Trail takes the visitor to the nearest alpine hut. Nicknamed “A little piece of Tibet in the Alps”, it is one of only two long trails in the Alps above a glacier. The Park is spending € 2 million to make it safer for visitors, partly by building tunnels in dangerous areas. There are also daily guided tours to the glacier, as well as weekly tours to see wildlife and wild flowers. All in all, the aim is to reach more people and encourage them to take the trails rather than just look at the view and buy some souvenirs.

Such a road would probably never be built today, especially in or around a national park, but it is a fact of life with which the Park has to contend. Efforts in the early 1990s to close the road to most traffic and allow only electric buses failed, and travelling up the road today it is only too apparent that visitors enjoy driving up the road in their own cars or on their own motorbikes. Clearly the tourism that the road generates does not correspond with the type of tourism that a national park would normally welcome, but has to be accepted as part of the regional economy. It can also be seen as an opportunity for enlightening a great many people with the ethos and ideals of the Park, differentiating the road from other scenic routes in the Alps.



▶
The lower two cataracts of the Krimml Waterfall (right) with the main trail up (above).



▲
The famous ancient larch trees of Zedlacher Paradies.

The Krimml waterfalls

Krimml is one of the most magnificent waterfalls in Europe, with water tumbling some 400m in three large cataracts. Derived from melting glacier water it is at its peak at about 10 pm on a summer evening, when most visitors have gone home, but from the spring to the autumn visitors will see a spectacular display from afternoon onwards. At present it attracts 400,000 visitors per year, down from an unsustainable peak of 700,000. The limit, however, is not the waterfall, but traffic in the valley below.

The tourists attractions at Krimml may distress some park purists, but contribute greatly to the local economy and divert numerous visitors away from sensitive and core areas. On arrival by train, bike, car or bus, the visitor is confronted with the WasserWunderWelt ("Wonderful World of Water"), a small theme park inside and outdoors with 'high tech' exhibits about water. Then, passing more tourist booths and displays, the visitor enters the forests near the base of the waterfall. Here a well-marked, hard-surface trail some 3–4 m or so wide takes the visitor upwards to the right of the waterfall cataracts. In the past the trail was less clear and visitors would wander all over the area. Now, the wide clear path and discrete edges of native shrubs and in places rails keep the visitors on the trail. Another advantage is that access is opened up to those in wheelchairs, a feature often forgotten in national parks. The Park authorities have invested

heavily in the trail, mending areas that have become damaged and providing numerous viewing points of the waterfall. On the other side of the waterfall, however, is an unpublicized traditional mountain trail that gives a real sense of tranquillity that the main trail cannot provide.

Some other examples

Many of the shorter trails with a lot of interpretation prepared by the park staff are actually outside the Park, but the park staff see no inconsistency in this. A good example is the Zedlacher Paradies, a wooded slope famous for its ancient trees of larch (*Larix decidua*) some of which are 600 years old and are protected as natural monuments. To provide grazing for the animals being taken to and from the high pastures, the spruce trees were removed, leaving a landscape of grassland and large scattered larch trees.

The Paradies has been a tourist site for over 150 years but until recently visitors tended to wander at will through the area. Now they tend to stick to the trail, enjoying metal models of animals that mark the eight stopping places scattered along its way. Most visitors are not dedicated naturalists or hikers, but have come for a gentle walk among the trees, and so the interpretation is ideal to fire their interest in nature and get across the message of the National Park. Local artists created the models, again strengthening links to the local community.



▲ Children can listen to amplified sounds of nature on this extraordinary device, on the visitors trail near Kals.



▲ The historic Klausnerhaus (Nature House) in Hollersbach.



▲ Displays on the trail at Zedlacher Paradies show the effect of a boot on a microscopic life.

Another impressive trail is one created for children near the beautiful village of Kals. Also well outside the Park, it includes a series of innovative exhibits to encourage children to appreciate nature and to stimulate parents to tell their children about nature. For example a device like a giant double foghorn allows a child to hear the sounds of nature amplified; a small merry-go-round enables children to look up and see silhouettes of various birds, while the father or mother rotates the device and provides the commentary. Amazingly, too, after eight years, none of the devices have been vandalized, a tribute both to Austrian children and to the inspiring nature of the devices. This is an approach that many other parks could take.

Providing information

Hohe Tauern has a substantial web site, as do many large national parks in Europe. This is an opportunity for the park to tell its story and outline its philosophy directly to the public. It is also an opportunity for the informed public to find the information they need quickly and easily, freeing up staff time that might otherwise be taken up answering the telephone, letters or emails. Contracted out to a professional web design company, it is clearly seen by park managers as a crucial and growing facility of the Park.

The Park has around 30 visitor centres, virtually all of them outside the park boundaries. Typically a visitor

centre is in a village, close to the church, and is shared with other organizations so that the building is a resource for the local community too. Many are no more than about 200m² in size, and can be run by a single person who takes money for books, postcards and other souvenirs. Each tends to focus on one topic, for example in Heiligenblut the story is about alpinism. There is a lot of technology well disguised, including an automatic cinema and a touch-screen system that mirrors (but is not identical to) the substantial web site of the Park. Text is short, with the emphasis on models, exhibits and photographs.

Whereas most of the visitor centres are in modern buildings, in Hollersbach the Klausnerhaus (Nature House) is one of the oldest houses in the village. Dating from 1350, it suffered a devastating fire in 1975 and was due to be demolished. The Park stepped in and restored the house, opening it in 1986. It includes the tourist bureau office and a local radio station, while its displays focus on the beautiful Hollersbachtal Valley, due at one time to be flooded for a hydrodam but now an integral part of the Park. An interesting feature is that the cosmetic company Yves Rocher have made an agreement with the village for local people to grow herbs for them in a field beside the Klausnerhaus. Besides the rows of *Arnica*, *Thymus*, *Althaea* and other herbs is a 'village botanic garden' where both alpine favourites and garden plants are displayed for all to see. Yves Rocher benefit by being able to say the herbs in its products are grown in the fresh

and clean air of the Park, the village from the jobs created and by having another visitor attraction.

A recent symposium in northern Finland co-sponsored by IUCN⁴ addressed future challenges for visitor centres and asked the question, might they be replaced by web sites. Certainly a web site is far cheaper. But as one participant observed, web sites cannot provide a café and toilets! More seriously, the symposium concluded that new media like the web should be seen as additional media, allowing the Park to reach a wider audience, and do not replace existing approaches like visitor centres and leaflets.

Great emphasis is put on information in nature. Signage in the high alpine areas is vital, principally for safety, and cooperation over this in the Alps dates back for over 100 years. A new project, called Info-points, in cooperation with the Austrian and German Alpine Clubs and with EU support, has three components:

- Interpretation at the c. 40 starting points of the trails, close to the car parks. Digital information from maps is being combined with stereoscopic aerial photographs to make impressively real panoramas for the displays.
- A new signing system common across the Alps. Data from each sign will be entered into a database and put on the Internet, so giving detailed information on the trails. The walker has the benefit of consistency – a massive manual is used to work out walking times! – and the signs have a vital safety role too.
- Interpretation at the 22 end-points of the trails, usually in the alpine huts. 90% of all the trekkers stay overnight in a hut, so good material on one of the inside walls of the hut is read. The material explains about the Park, outlines one ecological highlight, shows tours available, details the history of the hut, etc.

The benefits are obvious: safety is improved and the hikers have reassurance that they are on the right route. Most important for nature, the hikers are less likely to get into sensitive wildlife areas. It is all part of the philosophy of making the paths and trails so good that the visitors won't want to stray off them into other areas.

A crucial part of the park management is the ranger service. Following the European (rather than the American) model, rangers in Hohe Tauern are responsible for:

- Taking care of the facilities in nature;
- Interpretation through interface with the public and guiding; and
- Contributing to monitoring and research.

In Hohe Tauern, each ranger undertakes a four-year training, which includes communication skills and emphasizes feedback from the public.

Lessons

Park managers do not manage nature, they manage human impacts on nature. Nowhere is this more true than with visitor management, as the Hohe Tauern case shows. Some other general lessons can be drawn that may be of benefit to other parks across Europe.

- As the IUCN Guidelines on Sustainable Tourism in Protected Areas state, "Protected areas need tourism, and tourism needs protected areas". Tourism provides recreation, which is a stated objective of most protected areas, and is the opportunity for enlightened environmental education, the results of which will win allies for conservation in general. It creates jobs and generates income for the local economy, and makes peripheral regions less isolated, opening up their residents to new influences and cultures but also encouraging an intense valuation of the local culture and natural assets. And a strong focus on sustainable nature tourism is also the best argument against building new and damaging infrastructure like ski-lifts and hydrodams.
- In Hohe Tauern, and in most other large protected areas, visitors are best controlled by soft means rather than hard. If the Park provides outstanding trails and interpretation in areas chosen by managers visitors will not feel the desire to wander off into other, more sensitive areas. Also as elsewhere, in Hohe Tauern visitation goes back far beyond the history of the National Park, another reason why managers have to be cautious about removing the rights of visitors on access.
- Visitor management starts not with the visitor arriving in the Park but with how the Park and the local tourism agencies promote the Park to the public. The Park may well have ideas on the sort of tourists it wants to encourage and those it wants to discourage.

⁴ *Challenges for Visitor Centres: Linking Local People, Visitors and Protected Areas*. Maarit Kyöstiä, Anneli Leivo and Teppo Loikkanen (Eds). Nature Protection Publications of the Finnish Forest and Park Service, Series A No 129. Metsähallitus, Vantaa, Finland. 2001.



▲
An alpine meadow near Zedlacher Paradies.



◀
Marija Zupančič-Vičar admires a metal bear in the larch woodland at Zedlacher Paradies.

- It is probably impractical – and certainly politically very hard – to try and remove large elements of infrastructure like the Großglockner High Alpine Road because of its popularity with visitors and the resources it brings in. (A similar case is the cog railway to the summit of Snowdon in Snowdonia National Park, Wales.) A better policy is probably to use such facilities as an opportunity to tell visitors who not would otherwise come about the Park and to steer visitation away from other areas.
- However, to mitigate the damage such infrastructure can cause, the park managers should ideally be in charge of the facility or if that is not possible should at least have a substantial influence over how it is run. Co-operation with a commercial company is quite practical but the Park needs powers beyond those of just persuasion to be able to insist on suitable environmental safeguards.
- The example of the Krimml waterfall shows the need to have outstanding parks trails, which do not come cheap, and interpretation on key but relatively small sites, and to accept a certain amount of ‘tacky’ tourist infrastructure in one spot, knowing that it will provide a good experience for very large numbers of people, who might otherwise wander over much larger areas, and provide an introduction about the Park to those who are not keen hikers or walkers.
- Through guided tours the Park can absorb more visitors harmlessly than if the visitors wander on their own. Park should therefore encourage guided tourism, which also contributes more to local jobs than unguided visitation. It is also advantageous to take as much control as possible of the guided and other tours, to ensure they do not do harm and that they benefit the local economy. If this is not done, external tour operators may move in and organize tours that have no benefit to local people. Partnerships with trusted local tour companies are an important way forward for park authorities.

Hohe Tauern National Park is much larger and probably better resourced than most national parks in Europe. However, its message of an overwhelming focus on balancing visitor wishes and expectations with conservation of nature in a friendly and pragmatic rather than an ideological way is one that will resonate with park managers across Europe. Making sure that visitors enjoy their stays and that local people benefit from the Park is not just being nice, it is also a good policy to secure the long-term future of the Park.



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