

2.3 AIR QUALITY AND ITS IMPROVEMENT

2.3.1 SUMMARY OF EXISTING STATE

The situation concerning the air quality in the Study Area can be summarised as follows.

(1) Ambient Air Quality

- a) In general, the air quality in the Study Area has improved significantly during the 1990s according to the results of the automatic air quality monitoring at 5 local stations in the Study Area: 2 stations in Banska Bystrica area and 3 in Ziar nad Hronom area.
- b) However, concentrations of NO_x did not meet the short-term (daily and half-hour) ambient air quality standards by 1998 in the town of Banska Bystrica, although the annual average concentration met the standard in 1998 for the first time.
- c) Also, the annual average concentration of TSP in 1998 exceeded the standard at one station in Banska Bystrica.
- d) As far as is known from the results of the regular monitoring and particular monitoring projects or studies, no other pollutants, in the last few years in the Study Area, exceeded the ambient air quality standards or relevant norms and guidelines. These include SO₂, O₃ (ground level), Pb and Cd in TSP, CO, volatile organic compounds (VOCs), persistent organic compounds (POPs), heavy metals and fluorides.

(2) Air Pollution Sources

- a) In comparison with the year 1990, pollutant emissions in the Study Area decreased drastically by 1998: the emission of SO₂ in 1998 was 24 % of that in 1990, NO_x 30 %, PM 36 %, and CO 79 %. These reductions were mostly realised at stationary pollution sources. However, there seems to exist a number of plants, including large ones, that are still not able to meet the emission standards.
- b) To the total emissions of above-mentioned pollutants, the contribution of large stationary sources is still high in the Study Area: 33 % for NO_x, 74 % for SO₂, 31 % for PM, and 38 % for CO in 1998. But these ratios are lower than those in whole Slovakia; the contribution ratios of middle to small stationary sources in the Study Area are higher than the national averages.
- c) Of the total emission of NO_x in the Study Area, mobile sources account for 56 %, while the Slovak average is 35 %. According to the result of air quality modelling, the contributions to the ambient concentration of NO_x in the centre of Banska Bystrica are 39 % from road transport, 28 % from combustion and technology sources, 24 % from rail transport, and 9 % from others. The contribution of road transport has been increasing at the national and regional levels.
- d) According to the results of modelling on TSP in Banska Bystrica, the contributions to the ambient TSP concentration are 49 % from industries, 28 % from domestic heating / hot water production, and 24 % from sources outside the Study Area including foreign countries. Possible sources not considered in the modelling may include exposed soil and dust on the ground.

- c) Emissions of other pollutants such as fluorides, heavy metals and polycyclic aromatic compounds also decreased drastically during the 1990s, although it is said that their accumulation in soil has not decreased.

(3) Air Quality Management Systems

- a) The legal and institutional systems developed under the national environmental policy seem to have worked well for improving the air quality of the Study Area. Although this improvement may be partially attributed to decline in industrial activities associated with the switch to the market economy, efforts made by the government and industries should be duly appreciated. These efforts are continuing.
- b) Existing stationary pollution sources were to comply with the current stringent emission standards by 1 January 1999. But since a significant number of the existing plants were not able to meet this deadline, it has been postponed until the end of 2006. However, the provision of rapid increase of emission charges should motivate plant operators to comply with the standards before the end of 2006.
- c) There are two areas, one each in Banská Bystrica Okres and Ziar nad Hronom Okres, which are specified by a Government Resolution as non-attainment areas of air pollution, and each Okres is required to prepare a programme for air pollution abatement. Although these programmes will contribute much in reducing pollutant emissions from stationary sources, they do not deal with the issue of traffic emissions, control of which is of growing importance in achieving further improvement of the air quality.
- d) The local air quality monitoring network in Slovakia started its operation in 1993 with 32 monitoring stations. Due to the budgetary shortage, the number of actually operating stations decreased to 24 in 1999. Out of 5 stations operated in the Study Area by 1998, 3 stations became inoperable in 1999.

2.3.2 IDENTIFICATION OF AIR QUALITY ISSUES

Although the ambient air quality of the Study Area has improved to nearly acceptable levels, the following are identified to be the major issues:

Issue A1	A number of plants are still not able to meet the emission standards.
Issue A2	The NO _x concentration exceeds the short-term air quality standards in the town of Banská Bystrica and heavy traffic roadside areas.
Issue A3	The TSP concentration exceeds the long-term air quality standard in certain areas in the town of Banská Bystrica.
Issue A4	The number of operable air quality monitoring stations is decreasing due to the budgetary shortage.

2.3.3 OBJECTIVES, TARGETS AND RECOMMENDED MEASURES

The objectives, targets and recommended measures for the issues as identified above are summarised in Table S - 2 and described below.

The Slovak Republic is tackling various environmental issues in order to comply with international agreements and to meet requirements for joining EU. These include, for example, the reduction of emissions of major pollutants by 80 % from the levels of 1990 in Slovakia. A number of regulatory and economic measures to achieve such goals are already in force. Measures A1.1 and A1.2 are part of such efforts being pushed forward by the Government and being implemented by industries. The efforts should be continued with the highest priority.

A majority of the recommended measures, in addition to the above 2 measures, for Issues A2 and A3 have been selected from those already proposed in the Environmental Action Programmes (SR, Kraj, Okres) and/or the Territorial Development Plan but which have not been implemented, according to the information from the Okres of Banská Bystrica. Other measures (A2.5 and A3.2) have been newly proposed.

Expansion of gas supply (A2.1 = A3.1) in place of low-quality fuels such as brown coal are effective for reductions of both NO_x and PM, and is in line with a long-term strategic objectives of the national environmental policy. Its implementation is highly recommended.

Expansion of trolley-bus system (A2.2) is included in the environmental action programmes as a high priority of the Okres, and electrification of rail road (A2.3)) is included in the territorial development plan as well as the Okres environmental action programme with a high priority. Both measures are also in accord with a long-term strategic objective of the national environmental policy, but would not appear to be justified on air quality grounds alone. A feasibility study for Measure A2.3 is said to be completed and its cost being estimated at 890 million SK.

Construction of the road bypass (A2.4) is included in the territorial development plan and is a priority of the Okres. Construction of a tunnel is also being considered as an alternative. These measures will have an effect of reducing noise levels in the downtown area as well. However, since these will incur large costs, and may bring about various impacts on the environment, a comparative feasibility study on these options including the environmental impact assessment should be conducted, if not done yet, to examine the economic validity taking into account its role in regional development and to minimise any negative impact on the environment; this traffic bypass cuts the Rudlova - Sasova housing area. Then, the implementation of the more advantageous option should be ensured.

The Study Team has only limited information on NO_x removal in the Cement Works (A2.5) regarding the status of the project. The cost for the installation of the de-NO_x system

employing the selective non-catalytic reduction (SNCR) method is said to be 1,310,000 ECU. Although it is reported that the pollutant emissions from the Cement Work did not exceed the emission limits partly because of decreased cement production, implementation of this measure is also recommended if the production is to increase again.

The measure of planting exposed soil (A3.2) is included here as a possibility. Since there has been no information obtained concerning such areas, investigations are necessary. When exposed soils are found to be a significant source of TSP in the area of Banska Bystrica, implementation of this measure is highly recommended.

Under the current financial situation, a substantial and immediate increase of the budget for air quality monitoring from the current level may be difficult. However, it is necessary to maintain air quality monitoring at an appropriate level so that any changes in air quality, which may have negative effects on human health, can be monitored and necessary actions can be taken promptly. The preparation of such a plan (A4.1) should focus on the optimum distribution of monitoring stations based on the current and expected future state of significant air pollution sources. A certain level of improvement may be possible without large cost. Consideration should be given also to short-term spot monitoring, as required to supplement the continuous automatic monitoring, in co-operation with other agencies such as the State Health Institute (SZU). In such supplementary monitoring, possibility of introducing mobile monitoring stations should be considered.

2.4 MANAGING SOLID WASTE

2.4.1 SUMMARY OF EXISTING WASTE MANAGEMENT SYSTEM

(1) Waste Classification and Statistics

With regard to the estimation of the types and quantity of waste produced in the Study Area (and Nationally), there is neither a single system nor database for waste production figures. This is required to provide a reliable basis for waste management planning – for recycling, to determine the optimal number and location of landfill sites, transfer stations etc.

Under the regulations, waste is split into 3 categories, namely:

- Special;
- Hazardous;
- Other Waste.

These categories are segregated into 7 classifications (Class 2 and 6 not used) in the RISO system, for which a complex database of different waste types has been created, including:

- (Cat. 1) Waste from Animals and Vegetables;
- (Cat. 3) Mineral Waste, including Waste from Mineral Treatment Processes;
- (Cat. 4) Waste from Waste Treatment ;
- (Cat. 5) Waste from Chemical Processes;
- (Cat. 7) Waste containing Radio-active Substances;
- (Cat. 8) Waste from Water Treatment;
- (Cat. 9) Municipal Waste (Domestic, Trade, Office etc).

Within all these classifications, there are 130 major groups containing 750 different types of wastes, each with a unique code.

SAZP (COH) has the main responsibility for collecting information from the Municipality sources, but only for Special and Hazardous categories. The Statistical Office of the Slovak Republic (SOSR) collects data from waste producers, including industry data on 'Other Waste' types. Consequently, different sets of statistics are collected by two organisations, so that different databases are generated, both of which are published.

The system is further complicated by the fact that waste categories have been modified in recent times, so material which is readily recycled, such as manure, is no longer classified as waste. Consequently, there is no consistent database upon which to make comparative assessment of waste production figures.

(2) Waste Production and Disposal - Past and Present

In the Study Area, according to 1997 data, approximately 1 349 400 t and 503 700 t of Special and Hazardous wastes respectively were produced (SAZP figure) or 1 654 800 t and 164 100 t (SOSR figures), together with 947 400 t of Other Waste (SOSR figures; no SAZP data). It is generally accepted that the SAZP data is more accurate for the first two waste categories, notably for municipal waste. These wastes are disposed of in the following approximate proportions:

- 53% is landfilled;
- 33% is reused or recycled;
- 11.5 % treated;
- 1.5% stored;
- 1% incinerated.

In addition to the present disposal regime, with a range of old and new sites in operation, there are a large number of sites where waste material used to be deposited - although 'waste' was not legally recognised until 1991. This included not just municipal wastes, but also mining, metallurgical process waste, such as tailings and large quantities of agricultural material. The sites in which these wastes were disposed are referred to as Old Environmental Loads (OELs). Their distribution is shown in Map S - 2.

A major feature of the central government approach to waste, which has been developed since the introduction of the Waste Act in 1991, is for the operation of regional landfill disposal facilities. This requires proper control of environmental performances to ensure protection of the environment. The Study Area suffers from the financial problems that arise in many parts of Slovakia as a result of this policy, since the legacy of the OELs still requires to be addressed and there is also a need to invest in new landfills to meet the new regulations. Although there has been recent development of a number of the new controlled landfill facilities, there are still a large number of the older sites, due to be closed under recent legislation by July 2000, unless 'Special Conditions' have been applied to permit their limited future operation. These will be decommissioned and so will need replacing, whilst also requiring to be controlled and reclaimed or restored.

A large-scale investment programme is needed in order to provide sufficient capacity to meet future waste disposal needs, including assessment of alternative measures for waste treatment. To develop such sites, suitable sources of finance must be identified, it generally being assumed that the private sector will furnish the necessary funds. However, before the private sector can be persuaded to invest large sums in the waste disposal industry, there are a number of issues that need to be addressed. These include:

- obtaining clear, unambiguous statistical data on waste;
- need for regional or sub-regional plans to rationalise waste management in the Study Area, including the need to provide major waste transfer facilities;
- lack of prioritisation (technically and financially) of the continuing programme for reclamation or rehabilitation of OELs;
- the unsatisfactory nature of the treatment and disposal of medical waste (though not a responsibility of the private sector);
- lack of a reliable programme for monitoring of all operational landfill sites and selected OELs;
- evaluation of the potential for alternative methods of waste disposal and treatment;
- identification of appropriate means and locations for waste transfer, to accommodate the regional landfill strategy.

These issues, and recommendations for dealing with them, are discussed further below.

2.4.2 WASTE MANAGEMENT ISSUES AND RECOMMENDATIONS – DISCUSSION

The following issues and recommendations are summarised in Table S – 2, along with objectives and targets for this sector.

(1) Waste Statistics

A key issue of concern is the complicated nature of the existing waste classification system and the fact that the statistics for the waste are collected by two organisations in two different

ways. This does not allow for an accurate assessment of the quantity of waste to be disposed. This also prevents meaningful evaluation of future disposal capacity on anything other than a local basis.

It is important that both the classification of wastes and the collection of waste statistics, are rationalised, not just for the study area, but for Slovakia as a whole. The main thrust of this programme should be for legislative changes to permit one organisation only to collect and collate statistical information on waste. Once the classification of waste has been undertaken, the methodology for data collection can make use of the best aspects of the SAZP and SOSR system, so that full information is obtained for all three categories of waste. If publication is required by more than one organisation, then this can be effected, but using only the single data source, which has been devised by both the major players, under the control of the Ministry of Environment.

(2) Regional and Sub-regional Plans

It is important that the situation regarding the planning of all waste disposal is rationalised, given the reduced number of licensed landfills that will be available in the Study Area after July 2000. As a result of the large number of sites that are presently operational, major decisions will have to be made regarding the future make-up of waste management in the Study Area. Sub-regional plans may be desirable, so that each district or group of districts can establish a suitable strategy that meets the local needs, although this will increase the number of studies required.

The recommended studies will build upon the Regional Plan of the Kraj offices, together with the individual Okres Waste Management Plans (WMPs) that already exist. It is considered necessary to develop such a Strategic Plan so that a detailed practical programme can be developed to cover the specific issues of:

- minimisation of waste
- new site requirements;
- rationalisation of waste transport;
- financial provision;
- recycling and reuse of wastes;
- suitable development programmes;
- administrative arrangements.

The Plans will support the general principles that are laid out in the respective WMPs, which in turn reflect the requirements of the National WMP. Specific attention will have to be paid to individual industrial concerns, where large scale issues are known to exist, eg. the waste from the ZSNP Žiar nad Hronom.

It is highly likely that facilities and operations will have to be managed jointly, to achieve cost-effectiveness. However such management agreements should not be entered into without thoroughly studying and understanding the implications of each option or scenario.

(3) Old Environmental Loads (OELs)

A large number of the declared 550 OELs within the Study Area (RISO data) have been earmarked for removal or reclamation, with a proportion already having been dealt with. As with most of the statistical data for waste, information on the OELs seems to be variable. In this instance the figures from the Okres WMPs indicate that 83 sites had been reclaimed in the Study Area up to 1995, whilst the Banská Bystrica Kraj WMP indicates that 151 sites had been reclaimed in the period 1993-1996.

There are still, nevertheless, a large number of sites to be reclaimed, with an inherent cost. It will not be possible for all these sites to be dealt with in the near future, so that some form of prioritisation should be established for the sites. In order to effect this, a database should be developed, based on the sites identified in the old GSSR database for waste locations. This should be combined with a series of site investigations, site visits, mapping and aerial and ground photography, with the municipal authorities pooling their resources, data and knowledge, in order to develop a suitable list. It should be noted that, due to financial restrictions, it may be necessary for central government intervention to bring about the pooling of such resources. This can then be used to prioritise the reclamation and treatment of those sites which pose the greatest environmental risk to local communities.

In order to make a cost-effective assessment of the sites to be reclaimed or restored, it may be necessary to undertake further investigations and monitoring of the remaining OELs, notably to determine the environmental risk associated with each site. This may require extensive study, but will be a cost-effective exercise in the longer term, if it can help prioritise the order of reclamation of the remaining OELs.

(4) Medical Waste

The issue of medical waste incineration has been raised by a number of authorities. There are a number of incinerators used in the study area for the disposal of medical wastes. Their operation is reported to be poor in most cases, including the existing facility at Banská Bystrica hospital, the performance of which can only be described as atrocious.

The new facility at Banská Bystrica is waiting to be commissioned, after which it should meet the requirements of the Kraj. However, it is not clear if it will also satisfy Nitra Kraj's

future requirements. These should be investigated as part of the regional strategy, and a series of options considered for the future, long term, safe disposal of medical wastes.

(5) Monitoring of Waste Facilities

There is a legal requirement for the monitoring of the newly licensed landfills, but no equivalent for landfills operational prior to the introduction of the Waste Act. Therefore, not only are municipal waste sites not suitably covered, neither are the OELs. This situation should be redressed, as it represents a major gap in the information databases that are available to the environmental authorities, in trying to protect natural resources, notably groundwater. The exercises will be need to be prioritised, in order to be cost effective, but should certainly be applied to all major municipal waste landfills and those OELs posing greatest environmental risks.

(6) Alternative Disposal Methods

There is already extensive re-use or recycling of certain types of waste. This applies to agricultural waste, scrap metal, inert building material and glass and paper. The latter two materials, however, are mainly sourced from industry, with little success for municipal waste recycling, due to the costs involved, and the competition from imported materials, such as paper from Germany and Austria.

In order to overcome, at least partially, public reluctance to be involved with recycling schemes, raising public awareness is vital, which could also be made to help in waste reduction. However, it must be noted that a key to success is always to demonstrate cost-savings for the consumer, given that financial incentives are always, rightly, necessary to stimulate public AND municipal involvement in recycling programmes. Future realistic pricing, involving possible considerable increases, as new controlled landfills are developed, may help focus attention.

The range of alternative methods of disposal can be identified and investigated during the development of the regional and sub-regional plans, so that all Okres and municipalities, are aware of the alternatives available to the local communities.

2.5 ECOLOGY AND BIODIVERSITY AND THEIR PROTECTION AND MANAGEMENT

2.5.1 SUMMARY OF EXISTING STATE

The Hron Basin has a wide range of ecological conditions, with a broad range of altitudes, climates, geological and soil conditions in combination with large areas of natural and semi-natural forests, grasslands, aquatic ecosystems and traditional agricultural lands.

Additionally the Hron basin is located at the boundary of the mountainous western Carpathian and the lowland Pannonian (Danube) biogeographical regions. All these factors combine to provide the ecological conditions that result in a rich biodiversity.

The larger protected areas of the Hron basin (national parks and protected landscape areas) have the best ecological conditions and the highest biodiversity. For example the Muranska Planina National Park contains more than 80% of Slovakia's totals of mammal, reptile and amphibian species, whilst 55% of the country's birds are recorded from the Nizke Tatry National Park. Large mammal species which are rare or absent from many parts of Europe eg bear, wolf, lynx, wild cat, otter, wild boar and birds of prey occur commonly in the Hron basin. The presence of such important European species is a clear indication of the good ecological conditions in the Hron valley.

The occurrence of plant species is less well known. Muranska Planina National park has 1 150 higher plant species (37%) out of a total of 3 124 for Slovakia, whilst Vel'ka Fatra and Pol'ana Protected Landscape Areas have about 1 500 and 1 200 species respectively. Some of these are endemic species – mainly those that occur only in the Carpathian region, but also one whose only locality in the world is the Muranska Planina National Park. The protected areas also have high numbers of invertebrates. Many of the plant and animal species of the Hron basin belong to internationally recognised categories of endangered species and therefore have a high conservation value. For example 67% of fish species and 84% of mammal species in the Nizke Tatry National Park belong to endangered categories of fauna. All the protected areas of the Hron basin play an important role in protecting and conserving the flora and fauna of Slovakia and, for some species, of Europe.

The major ecosystems of the Hron basin can be divided into forest, grassland, aquatic/wetland and agricultural. About 47% of the area is covered in forest and much of it is natural or semi-natural. These are high proportions by European standards and they include a variety of different types, for example oak, beech, spruce, fir and mountain pine. All forests are actively managed and generally maintain good ecological conditions although biodiversity will be less in the more managed forests than in those less intensively managed. The Hron basin grasslands are mainly the result of deforestation to provide agricultural lands, although natural ones exist above the tree line (about 1500 m) in the Nizke Tatry National Park.

Aquatic and wetland habitats occur throughout the Hron basin, though generally they are small. There is a wide range from the slow flowing river and associated wetlands of the lower Hron to sub-alpine streams and bogs. Many wetland habitats have been lost through

developments such as urban areas, roads, industry and agriculture whilst others have been badly affected by river engineering projects for water abstraction, irrigation and flood control. Despite such changes however the Hron river has high fish biodiversity with 52 species recorded from it. These include rare and endangered fish; between Brezno and Zvolen *Hucho hucho* and the lamprey *Tinca tinca* have been recorded. In the lower part of the basin *Pelecus cultratus* has been recorded. Agricultural areas occupy about 45% of the Hron basin. They range from the intensively managed lands common in the lower valley to the more traditionally managed farmlands of, for example, Detva and Pol'ana. The ecology and biodiversity in the former lands have been badly affected, but the latter support good ecological conditions and high biodiversity. The Hron basin has a large number (133) of protected areas that in total cover 30% of it. They include all categories (Levels II-V). The largest category is national park, which covers 1 137 km² (21%) of the basin, with the majority being in the Nizke Tatry National Park. These areas are managed for their ecology and biodiversity by the relevant authority - National Parks Administration for national parks and the Slovak Environment Agency for all other categories. Four of the Hron basin's protected areas also belong to conservation categories designated through international conventions. These sites (Nizke Tatry National Park, Vel'ka Fatra and Pol'ana Protected Landscape Areas and the Parizske Mociare National Nature Reserve) are therefore recognised as being of major international significance.

Forested protected areas are also managed by the forestry authorities, principally for their timber production. They serve many other functions, for example for water and soil protection, avalanche control, health resort and immission control, and are also managed for these purposes. In some instances the differing objectives of the forestry and protected area authorities lead to disagreement over how the forested areas should be managed. It is clear that most forests are in a good ecological condition with high biodiversity. However, evidence suggests that, in the past both air pollution and soil contamination caused more widespread damage to forested areas, this has reduced over time. There may still be localised damage to forests in certain areas. The main exceptions are those of the lower Hron in places where river engineering projects have altered water flows and water tables to the detriment of riverine forests. The regulation of water flow has changed the water flow regime, affected the water table and thus also the condition and composition of forests in the lower Hron.

Current forestry policy is to further increase forest management procedures for the benefit of ecology and biodiversity – the ecologisation of forestry. This can be done by increasing, for example, the amount of forests regenerated by the shelter belt method and by changing forest composition to more closely match the natural vegetation of the area.

Although there are pressures on the ecology and biodiversity of the Hron Basin, they are generally in good condition. They make a significant contribution to the quality of life in the valley and are essential for sustaining many of the recreation and tourism resources of the area. It is therefore essential for the future that they are well managed and continue to provide these functions, as well as maintaining or improving their ecology and biodiversity.

2.5.2 ISSUES AND RECOMMENDATIONS

(1) Air Pollution

Results from this study show that about 7% of sulphur dioxide and nitrogen dioxide pollution originating in Slovakia, come from the Study Area. Additionally, up to 70% of the air pollution in Slovakia is from sources outside the country. Therefore, taking measures to improve the quality of atmospheric emissions discharged within the Hron basin is not likely to have any significant effects on ecology and biodiversity. At present, such effects are believed in any case to be minimal. Air quality emissions in the Hron basin have improved in recent years due partly to the slow down in industrial activities and the incorporation of improved pollution control measures in the remaining industries.

Therefore air quality issues caused by emissions in the Hron basin are not considered a priority for ecology and biodiversity. Air pollution from sources outside the Hron and Slovakia are outside the control of the Hron basin authorities.

(2) Water Pollution

Virtually all water pollution in the Hron river and its tributaries originates from within the basin. Only that from rainfall or atmospheric pollution comes from outside the catchment and this will form only a small fraction of the total. Otherwise, the pollution comes from industrial, mining, domestic and agricultural sources.

In recent years, water quality in the river Hron and its major tributaries has improved. This is due to improvements in and installations of waste water treatment facilities and a general reduction in emissions due to industrial slow down. The major sources of pollution are untreated or poorly treated discharges of domestic waste water and agricultural run-off, especially in the lower Hron. There is also the possibility of accidental spills and leakages from the industrial sites of the middle and upper Hron.

Stretches of river now support thriving fish populations, whereas up to about 10 years ago they were absent or much reduced in numbers and diversity. However, the Slovak Fishing Union reports that water pollution (apart from major spills) still has adverse effects on the fish populations of the Hron. (The data from the Slovak Fishing Union are collected for long

stretches of river and general figures showing satisfactory numbers may not detect localized problems near polluting sources, eg Banska Bystrica sewage outfall, where pollution may affect fish populations; regular stocking of the river may also mask long standing pollution problems.) Accordingly, remedial actions to improve water quality remain important for fish ecology and biodiversity. In addition there have been several incidences where releases of pollutants into the environment have caused the deaths of large numbers of fish, e.g. accidental release of chemicals from Biotika. There is no available information on pollution effects on aquatic invertebrates and plants. Where fish populations are apparently healthy (though subject to regular re-stocking), such effects are not likely to be significant, but localised effects must exist near pollution inflows.

(3) Forestry

Forest protection and management techniques have undoubtedly done much to maintain ecology and biodiversity within the Hron basin, as throughout much of Slovakia.

There is however, recent discussion within Slovakia as to how forestry management can improve still further, so far as ecology and biodiversity are concerned, without significantly affecting the principal roles of forests (commercial, protection, special). This discussion considers how forestry can become more ecological. The aim of the ecologisation of forestry is the creation of optimal conditions both for maintaining and improving the essential role of the forests and the ecology and biodiversity of the forest.

To improve forest ecology and biodiversity, the following two projects are recommended for immediate implementation.

Management Procedures for Ecology and Biodiversity

Research into forest ecology and biodiversity has to date been undertaken mainly by the Forest Research Institute at Zvolen. This is through its research programme *Conservation of the Biodiversity of Selected Forest Ecosystems and their Integrated Protection*. The project started in 1995 and is due to finish in 1999. It consists of seven research projects (listed in the Main Report) with field studies carried out at three sites: mixed broadleaved and coniferous forest in the Hron basin part of the Nizke Tatry NP, coniferous forests of the High Tatra NP and in a beech forest in west Slovakia.

This research programme can make a valuable contribution to forest management planning for ecology, biodiversity and maintenance of the primary roles of production, protection or special purpose. To increase the usefulness of the project it is recommended that:

- the project be continued beyond the present completion date of 1999 for at least another five years monitoring;
- that a fourth forest type, oak forest, be selected for immediate inclusion in the programme from the Stiavnické Vrchy PLA. At the moment this major Hron basin ecosystem is not included in the research programme;
- that biodiversity monitoring be expanded to include animal groups.

The true value of this research programme will only be realised if forestry management procedures that improve, or at the very least maintain, forest ecology and biodiversity are incorporated into forestry management plans prepared by the Lesoprojekt. Thus, the results obtained from the research project's presently planned completion in 1999 should be fully considered and used to prepare such forest management guidelines. This process should be undertaken by the various agencies with major interests in managing and developing the Hron basin's forests:

- Forest Research Institute;
- Lesoprojekt;
- Nízke Tatry National Park;
- Slovak Environment Agency (COPK);
- Regional Forestry Authority;
- Ministry of Environment, Department of Biodiversity Conservation;
- State Forest Enterprise.

If the project is extended and expanded as recommended, forestry management guidelines for ecology and biodiversity can be improved as the project proceeds and experience and information are gained. The guidelines will only be implemented if all agencies concerned with forest management are involved in their development and fully agree with them.

Close-to-Nature Forestry Practices

This recommendation is for the establishment of demonstration sites at which forest management procedures designed to enhance ecology and biodiversity are practised. In general these procedures are well known but not always implemented through lack of financial resources or appropriately trained staff.

As there are many forest types in the Hron basin, several demonstration sites should be established to cover the range of different procedures required. The procedures would include those for logging methods (eg. shelter belt, selection), planting and regeneration, thinning methods and planning for ecology and biodiversity. Experience gained from the ecology and biodiversity project should be incorporated into the demonstration site methodologies.

The following methodology could be used or modified as agreed between the participating agencies:

- Selection of a variety of forest demonstration sites, ideally in areas where nature conservation is high priority eg. gene reserves, national parks, protected landscape areas;
- Detailed inventory of the sites eg. tree species, age, ownership, condition, management conditions (topography, accessibility), present silvicultural methods, role (commercial, protection, special purpose);
- Agree criteria and indicators of management;
- Derive functional zones if appropriate eg. core or buffer zones;
- Develop long term management goals;
- Develop operational management guidelines for each part of the demonstration site;
- Prepare detailed management techniques, especially those concerned with shelterwood fellings, selection felling, protection of areas where natural regeneration is already occurring, and stimulation of natural regeneration through treatment of the forest floor.

The Slovak Environment Agency is interested to develop close-to nature forestry practices in the proposed Balocke Vrchy PLA as a part of its management plan. This is so that improved forest management measures can be undertaken particularly in the vicinity of the existing Dobrotsky Prales Nature Reserve, an area of virgin forest. This locality could be considered for inclusion in this project.

The project would result in model documentation and management plans for areas of high conservation (ecology and biodiversity) importance. Additionally, the most urgent protection and silvicultural measures could be implemented. The sites would be actively used to demonstrate close-to-nature forest management measures to such interested parties as forest owners, staff of the Slovak Environment Agency and National Parks Administration, Regional Forest Authorities, Forest Authorities, State Forest Enterprises, Lesoprojekt, forestry students, schools etc. In this way, widespread acceptance for the need for rapid implementation of close-to-nature forest management measures can be rapidly encouraged. One demonstration site should be set up at the proposed forest-based tourism site.

To prepare and implement this recommendation requires joint planning and agreement by several key agencies: Forest Research Institute, Slovak Environment Agency, National Parks Administration, Lesoprojekt and the State Forest Enterprise.

The two major recommendations presented above require a great deal of cooperation and interaction between the many agencies concerned with forest management. To date, such cooperation has not always been evident. In particular, there is only limited contact and cooperation between the Forestry Section and Lesoprojekt staff and those of the agencies such as National Parks Administration and the Slovak Environment Agency. Improvements

in contacts between all these agencies are needed and their joint agreements are required for management measures to improve and maintain ecology and biodiversity. At the same time, such measures must not reduce the forests' primary roles of production, protection and special purpose.

(4) Agricultural Lands

There are few protected areas in the intensively cultivated landscapes of the lower Hron. To improve ecology and biodiversity in this region the Slovak Environment Agency and the Nitra Kraj and Okres environment departments should jointly locate and declare more protected areas in this part of the catchment. The priorities must be for remaining areas of forest, steppe and wetland sites that are representative of the once widespread habitats of this region.

There should also be an extensive tree planting programme, and other habitat creation schemes in the arable lands of the lower Hron. These will serve to:

- create habitats for birds, small mammals and other fauna and flora;
- reduce wind erosion of soils;
- increase landscape attractiveness;
- develop biocorridors to facilitate movement of flora and fauna between the region's scattered biocentres;
- help to prevent flooding and siltation of reservoirs.

These habitat creation schemes should be carried out as components of M-USES and promoted by their incorporation into Okres and municipal/cadastral environmental action plans. Consequently, the Slovak Environment Agency should adopt as an urgent priority the necessity for preparing and implementing M-USES. All tree plantings should be of species that used to occur in the area's ecosystems and should be along existing watercourses, drainage canals, farm roads, paths and old field borders.

The Slovak Environment Agency should also identify and adopt indicators of improved ecology and biodiversity in the lower Hron. These could include such things as the numbers and types of farmland and woodland birds, the length of hedgerows or areas of tree plantings. Such indicators could be surveyed and assessed annually with the assistance of local nature societies, ornithologists etc.

(5) River Engineering

River engineering works, past, present and future, undoubtedly affect the fauna and flora of the Hron itself and the adjacent flood plain communities, especially the riverine forests and

grasslands. The extent of such changes, which are evident throughout the Hron and its tributaries, has not been fully documented.

For the management of ecology and biodiversity of the Hron floodplain and river it is therefore recommended that, in the first place, a survey of the basin is made to locate all major river engineering works (dams, weirs, levées, river straightenings, offtakes, river bed excavations, river channelling, removal of river bank trees, planting of exotic tree species on river banks etc). At the same time, an assessment should be made of existing studies on their likely or actual impacts on the river's aquatic and riverside ecosystems, and further studies could be formulated and carried out to investigate effect further, if necessary.

This survey should then be used to prepare guidelines for the protection of aquatic and riverside fauna and flora during future river engineering works, and identification of areas along the river where revitalisation is now needed due to past engineering works.

Examples of engineering works that have caused significant environmental problems are the Vel'ke Kozmalovce dam near Levice and the river straightening works in the lower Hron. The former was built without a fish pass, and has effectively stopped all fish migrations up and down the river at this point. This has caused reductions in the migratory spawning movements of fish and therefore decreases in fish numbers. To help in restoring these losses, the Slovak Fishing Union releases large numbers of fish each year into the Hron. Recommendations have been made in the past for a fish pass at this barrage but have not been implemented to date. It is again recommended that this pass be implemented. The river straightening works have led to the loss of riverine forests and wetlands due to the soil drying out because of reduced flooding and lowered water tables. Proposals have been prepared by Povodie Hrona to revitalize the river around Zelizovce and Kamenin but await implementation.

Where the need for major remedial actions is identified, proposals for such actions need to be prepared or existing plans implemented (eg the fish pass at Vel'ke Kozmalovce). Funding for such projects, all of which are necessary to rectify past mistakes, should be a priority.

(6) Management Plans for Protected Areas

The national park, protected landscape areas and nature reserves of the Hron basin either do not have sufficiently detailed management plans or none at all. Even where they exist, implementation is slow or zero because of limited funding and personnel. In turn, this means that implementation is given a low priority by government.

The preparation and implementation of good management plans is essential to the long term future of the Hron basin's protected areas. They face many pressures, not the least of which will be rapidly increasing tourism in the future and the protection of the many endangered species of fauna and flora they support. If these pressures are not adequately foreseen and planned for by the preparation and implementation of management plans, then the high quality of the Hron's protected area network will suffer and decline.

The management of most of the Hron's protected areas is made very complicated by the involvement of two major government agencies: the protected areas' authorities (National Parks Administration or Slovak Environment Agency) and the forestry authorities. In the main, the forestry authorities have the major say (via forest management plans) in the management of the forests within the national parks and protected landscape areas. There is therefore some conflict between these agencies as each has different objectives and desired management measures for them – one mainly for the protection of ecology and biodiversity and the other for timber production.

It is recommended therefore that the National Parks Administration and the Slovak Environment Agency prepare management plans for the protected areas under their jurisdiction. For the Agency, this should initially be for the protected landscape areas. These plans must be prepared with the full cooperation and agreement of the forestry authorities and landowners. If a national park or PLA management plan does not conform to the requirements of a forestry management plan, then it will have no chance of implementation. The trend in the preparation of FMP's is for them to become more concerned with ecology and biodiversity issues, and recommendations elsewhere in this chapter seek to promote such considerations further. Thus the cooperation of the National Parks Administration, the Slovak Environment Agency and forestry authorities in the preparation of management plans by the protected areas' authorities provides an additional way of promoting ecology and biodiversity issues in the Hron basin.

The preparation of detailed management plans for the large national parks and protected landscape areas of the Hron basin will be a lengthy process (up to three years) and expensive. Their implementation will be considerably more expensive, as they would inevitably contain recommendations for increased numbers of staff and various capital works. International funding is likely to be required.

The issues, objectives, targets, measures and proposed implementing agencies for projects to enhance ecology and biodiversity are summarised in Table S - 2.

2.6 HERITAGE AND TOURISM RESOURCES: ISSUES AND RECOMMENDATIONS

2.6.1 SUMMARY OF EXISTING STATE

The Hron basin has a diverse range of heritage and other tourism resources that are of significant importance at the national and international level. These include for example, the UNESCO World Heritage site of Banská Štiavnica and the national parks of Nízke Tatry, Muránska Planina and Veľká Fatra Protected Landscape Area. At present the Hron's tourism resources are not developed to their full potential, perhaps due to lack of co-ordinated action between the authorities with responsibility for tourism and tourism-related activities and sites in the area, absence of detailed tourism development plans for major sites, a shortage of funds, a lack of training or required knowledge amongst people in the tourism industry and a reluctance to increase tourism in areas where there is such potential eg the forests of national parks and protected landscape areas.

A range of Sites of Interest, natural and man-made and including some of the spas and more interesting and accessible 'monuments', have been described in a series of tourist maps published by Vojenský Kartografický Ústav (VKU). The sites selected give an indication of some of the most important resources for tourism and therefore of those sites which should be amongst the priorities for protection and management within the basin. A database of the locations of each of these sites, with descriptive text, has been prepared by the Study Team (details of the dataset are given in the Supporting Report, Annex O.1). Map 5.6-2 of the Main Report shows the locations of the 73 sites of tourism interest that fall within the Study Area; most of these occur in the upper part of the Basin in Banská Bystrica Kraj.

(1) National Parks and Protected Landscape Areas

The Hron basin's national parks and protected landscape areas, along with Levels IV and V protected areas categories, are a major tourism resource at regional, national and international levels. The mountains and forests with their mature and frequently spectacular landscapes provide the opportunities for a large variety of outdoor recreational pursuits. In addition, the forests and mountains of Slovakia are symbols of the country's cultural heritage and national psyche or identity. The forested mountain landscapes of the middle and upper Hron are amongst the finest in the country, and therefore a major national asset.

In general, tourist activities have little effect on the fauna, flora and landscapes of the national parks and other protected areas. In some localities however high visitor numbers and the provision of facilities for them, eg at ski slopes, are causing localized problems of erosion,

visual degradation and habitat damage. In some areas the visitor carrying capacity is being exceeded and needs to be amended either by reducing visitor number or improving their management and that of the tourist areas. At the moment, the tourism potential of the national parks and protected landscape areas is only slightly developed. With good planning and management it can be greatly increased with no significant negative effects.

(2) Caves

There are 3 946 listed caves in Slovakia of which 302 (7.7 %) are in the Hron basin. Twelve of these (Show Caves) are open to the general public, of which two are in the Hron basin - Harmanecká near Dolný Harmanec and Bystrianska near Brezno. In 1997 a total of 53 369 people visited these two show caves. The Slovak Environment Agency has identified the most important 450 caves in Slovakia of which 58 (12.9%) are in the Hron basin (Map 5.6-1). They are located mainly in the karstic limestones of Muránska Planina National Park and Veľká Fatra PLA and the Nízke Tatry National Park around Brezno.

(3) River Hron

The Hron river and its tributaries are important for sport fishing, mainly for local resident members of the Slovak Fishing Union. The Hron river also has considerable potential for canoeing from around Brezno to Sturovo. This activity is little developed at present. The present discharges of inadequately treated industrial and municipal wastewater are factors that, amongst others, prevent its full development. Accidental releases of poisonous materials are a threat to fish, as was seen in 1998 when all fish in a 20-kilometre stretch of river around Banská Bystrica were killed by the release of ammonia from an industrial site. The abstraction of water from the reservoir at the Veľké Kozmlovce dam, for industrial and irrigation purposes, results in low river flow immediately below the dam. This also makes difficulties for canoeing, particularly at times of low river flow.

Below small villages the quality can decline quickly due to inadequate treatment of sewage and solid wastes. The headwaters of the Hron river, below Telgárt, are badly disfigured by careless disposal of rubbish. The upper tributary streams are important for the rearing and growth of sport fish, particularly brown trout.

Although many indicators of Hron water quality show a reasonable standard, the river is Class V for microbiological indicators such as *E.coli* and total bacteria along much of its length. This classification (the worst) means that the river water is unsuitable for contact activities such as canoeing and swimming. In such Class V areas the water is a health risk. Necessary ancillary infrastructure, such as mooring places, riverside camp sites, signposts and general information about the river's tourist sites are also absent.

(4) Cultural Heritage

The Hron Basin's cultural heritage is a major tourism resource, at national and international levels, in the form of archaeological sites; historic buildings, industrial and mining sites, town centres, gardens and parks; museums and galleries; folk traditions (costumes, dances, songs). Cultural Heritage did not fall within the Scope of Work of the Study but, because of its significance in the Basin and at the request of the SAZP, the Study Team have made an effort to address some key aspects. However some elements of cultural heritage e.g. museums, folklore (traditional dancing, music, literature etc) are not covered in this report. In terms of the built environment, which is the focus of this section, the cultural heritage of the Hron River Basin is especially rich. In particular there are:

- Three Historical Monument Reserves (HTR) - Banska Bystrica, Banska Stiavnica, Kremnica
- One Technical Monument Reserve (TMR) - Stiavnicke Bane
- One Folk Architecture Reserve (FAR) - Spania Dolina
- Several Historical Monument, Technical Monument and Folk Architecture Zones - these include Hel'pa, Brezno, Zvolen, Kremnicke Bane and Nova Bana

Of exceptional importance is the historical town of Banska Stiavnica and the 'technical monuments' of its surroundings, especially its 23 water reservoirs (*tajchy*). These were designated a Cultural World Heritage Site by UNESCO in 1993.

Only one Folk Architecture Zone (Batovce) has been designated in the lower part of the Study Area (Nitra *Kraj*), though three others are in the process of selection and approval. However, the upper part of the Study Area is particularly rich in Cultural Heritage Reserves / Zones. It has 4 out of Slovakia's 18 Technical and Historical Monument Reserves, one Folk Architecture Reserve and one of only three Cultural World Heritage sites.

Historic buildings or 'Monuments' are classified according to various types (Immovable and Movable; Architectural, Archaeological, Technical etc) and kept on a computerised register by the Institute of Monuments of the Ministry of Culture. The Institute also holds a list of 'Endangered Monuments', this being recognition that urgent action is required to prevent further deterioration or loss of the monument.

There are 105 Immovable Objects recorded as 'Endangered' in the Study Area. Most of the endangered Monuments are found in the *Okres* of Banska Stiavnica (38), Zarnovica (25) and Ziar nad Hronom (20) which is a little unexpected given that the *Okres* with the highest percentage (30.7%) of monument records in the Study Area is Banska Bystrica (Table 5.6 – 2 and Map 5.6 – 5 of Main Report). This suggests that considerable attention has been paid to the maintenance and restoration of monuments in Banska Bystrica *Okres* (the attractive

renovation of Banska Bystrica town square is a witness to this). Considerable attention now has to be paid to restoring those monuments in the other *Okres*, especially Banska Stiavnica since it is a World Heritage Site.

2.6.2 ISSUES AND RECOMMENDATIONS

The Issues identified as requiring attention, and the recommended "Objectives, Targets, Measures and Implementing Agencies" are summarised in Table S – 2, along with objectives and targets for this sector. They are explained in a more detail below.

(1) National Parks and Protected Landscape Areas

Issue (H 1) Lack of Tourism Development Plans

The principal issue is the lack of comprehensive tourism development plans for the Hron valley's national parks and protected landscape areas. These need to be prepared and implemented so that tourism can develop in them in a coordinated and sustainable way. Such tourism plans must be entirely compatible with the primary functions of these areas ie wildlife and landscape protection and management and timber production, so they may need to make provision for limiting visitor numbers where pressure is threatening to damage the resource. Accordingly, their development must be in full cooperation and agreement with the relevant forest, National Park and protected areas management authorities. The main priority areas requiring such tourism development plans are the Nizke Tatry and Muranska Planina National Parks and the Pol'ana and Vel'ka Fatra Protected Landscape Areas. Such plans should find and recommend ways in which the agencies responsible for these areas (National Parks, Environment Agency and Forestry) can benefit financially from tourism development. The planning studies should investigate the possibility of charging entry fees to each protected area, and/or selected attractions and facilities within them, both as a means of generating revenue and of controlling visitor pressure on the more sensitive resources. The availability of such revenue should increase the commitment of the management authorities to promoting tourism development, as well as providing funds for conservation and management/development activities. The private sector and local communities should participate in the preparation of these plans since both may be able to contribute to and benefit from the successful management of the Parks and PLAs.

There is considerable potential for increasing tourism in the forests of the Hron basin. Forest-based tourism is actively encouraged and developed in many countries eg Poland and the UK and such an approach could readily be integrated into tourism development plans for the Hron valley's protected areas. In Poland, the forests in which tourism is encouraged are known as Promotional Forest Complexes and have the following goals:

- identification of all forest communities and changes occurring in them;
- permanent preservation or reconstruction of valuable features;
- integration of the goals of sustainable forestry management and nature conservation;
- promotion of multi-functional and sustainable forest management;
- research for eco-development;
- organization of training courses in forest ecology.

For tourism in forest areas to be successful, a considerable expansion of facilities and available infrastructure is required in the Hron valley. For example, consideration should be given to all of the following: educational trails, educational centres with good information and exhibits, roads, car parks, accommodation such as inns, lodges, huts and campsites, outdoor theatres, arboretums, forest gardens, cycling and horse-riding trails, forestry methods demonstration sites. The forested areas of the Hron valley already have a very good network of roads, which in general the public cannot use. Some of these could be opened to the public as a component of planned tourism development in the forests.

(2) Caves

Issue (H 2) Lack of Protection for Caves

The principal issue is the lack of legal means to adequately protect the areas surrounding all caves, though those in Levels II-V protected areas have the protection afforded to such localities. Legislation is due to be passed that authorises the establishment of protection or buffer zones around caves. This is intended to restrict potentially damaging activities from occurring in their vicinity. Once the legislation is enacted, such zones should be established, by the Slovak Caves Administration around the most important caves of the Hron valley. The Administration has identified 58 such caves in the valley. These zones should be made known to the Kraj and Okres development authorities to assist in the decision-making process for proposed developments near caves. Additionally, the Slovak Caves Administration should notify all the local development authorities of the precise locations of caves. These are not well known at present, and accidental damages could well occur without knowledge of where caves are located.

(3) Hron River

Issue (H 3) Poor Microbiological Quality of River Water

The main issue is the poor microbiological quality (Class V) of the Hron river. This makes water contact sports a health hazard for participants. Water quality needs to be improved to at least Class III and the only way to do this is to improve the quality of domestic waste water emissions from urban and village areas. Recommendations for such measures are included in section 2.1 of the Summary.

(4) Cultural Heritage

The issues identified mostly represent problems that must be solved to protect the Hron Basin's cultural heritage. However, the heritage resources of the Basin should be regarded as a rich resource worthy of investment, both to improve the quality of life of its inhabitants and to develop what is believed to be the significant economic potential of tourism for the region.

Issue (H4) Pressures From Economic Change

Main Elements

- Damage to monuments associated with economic reform and rapid redevelopment, with inadequate studies prior to developments.
- Changes in rural way of life leading to abandonment of homes with valuable 'folk architecture' or desire to modernise for those who do find alternative employment in rural areas.
- Frequent changes of ownership.
- Decline in industry/mining (technical monuments).
- Air pollution damaging stone buildings, though perhaps less than in the past.

Discussion and Recommendations

(H4.1). Since the exact nature of the pressures will vary from place to place within the Study Area it is believed that the best approach to addressing the issues on an area specific basis will be through the preparation of Management or Action Plans, where they do not already exist. Priority should be given to those areas with a concentration of monuments ie the Monument Reserves and Zones and especially the Banska Stiavnica World Heritage Site (WHS).

The SAZP Centre for the Protection of Natural and Cultural Heritage (COKPD) has already recognised the need for such a Management Plan for the Banska Stiavnica WHS. For instance the Center believes that its is unable to give satisfactory advice to investors who do have funds to restore and develop the buildings and other monuments of the site, and the diverse stakeholders need to agree the issues and priorities and take action in a co-ordinated manner. As well as going to a sufficient level of detail to be useful to respond to detailed questions, the Management Plan for Banska Stiavnica WHS needs to be broad in its scope, because of the size and diverse attributes of the area and the need to meet the requirements of the many stakeholders. The area includes numerous technical monuments (mines, reservoirs, water channels and associated structures), historic buildings (castles, churches, town houses, folk architecture) and complex landscapes – as well as modern infrastructure and industrial, commercial and recreational activities, not all of them in keeping with a World Heritage Site nor in sound condition. Therefore, if it is to cover all the issues, the plan is likely to need a multi-disciplinary team, co-ordinated by a planner and including landscape, tourism,

environmental, architectural, mining, economic investment and other specialists. To ensure that the scope and team are comprehensive, the Terms of Reference for the plan will have to be prepared carefully with the agreement of the major stakeholders (see below). The preparation of a management planning study of this nature, for such an important site, would be a good candidate for international funding. In turn, a good management plan is likely to attract further international funding for implementation.

These heritage management or action plans will need to take into account existing territorial plans for the locality in question. However, if the territorial plans have not taken monument protection, heritage and tourism issues fully into account the heritage plans should not be constrained by these limitations and should recommend changes to the territorial plans.

(H4.2). To obtain the support and agreement of stakeholders to management proposals, the Management and/or Action Plans must be prepared in a participatory manner. Already the Centre for Heritage has held meetings with NGOs, the *Okres* office etc and is proposing a permanent Working Group for the Banska Stiavnica WHS. This would need to include the *Mesto*, Povodie Hrona (which has been undertaking a restoration programme for some of the *Tajch* reservoirs associated with mining).

(H4.3). To provide some economic justification for the preparation and implementation of the above plans, it will be necessary to promote cultural and rural tourism such that appreciation of the Basin's heritage is enhanced and rural livelihoods (and thus monuments etc) are supported. A strategy and action plan to do this therefore needs to be prepared, on a basin-wide basis, and could possibly be undertaken with support from SAPARD.

Issue (H5) Pressures Related To Institutional Issues, Legislation and Compliance
Main Elements

- Inadequate appreciation in some quarters of the economic/tourist value of monuments, such that entry fees are small or not charged and visitor statistics are not kept.
- Weaknesses and gaps in legislation on the Protection of Monuments (No. 27/87 of the Legal Codes).
- Weaknesses in the institutional systems related to the management of monuments, including complicated procedures.
- Non-compliance with conditions for building work.

Discussion and Recommendations

(H5.1) Improve awareness, of the public and decision-makers, of monument conservation and promote its importance in the Hron Basin through (i) the media (TV, radio and newspapers) (ii) involvement of NGO's, youth and children in conservation and restoration

activities for carefully selected monuments and (iii) the provision of educational courses and seminars.

(H5.2) Tightening, simplification and updating of the legislation to protect monuments, with clear provision for (i) closer involvement of Institute of Monuments staff in inspection activities (ii) higher penalties for those who deliberately damage cultural monuments and (iii) incentives to encourage restoration - in accordance with both the original appearance of the monuments and their significant details (iv) charging of entry fees. The present law is perceived in some quarters as being so restrictive that owners of historic buildings, which are protected monuments, are discouraged from repairing them, such that the buildings deteriorate further. The amended legislation needs to strike a balance between being realistic and motivating in what is expected of owners, yet tough enough to act as a deterrent to those owners and developers who might deliberately damage historic property.

(H5.3) Harmonisation of various technical standards with legislation on the protection of monuments, such that exceptions are permitted where the conservation of architectural or other valuable monument details requires this.

(H5.4) Stricter monitoring and enforcement of monument legislation and conservation consents.

Issue (H6) Resource and Skill Shortages

Main Elements

- Lack of financial resources for the Institute of Monuments and other responsible institutions (eg *Kraj* and *Okres*) to carry out their duties for the protection and management of cultural heritage.
- Inadequate resources for maintenance and restoration – especially urgent repairs to endangered monuments.
- Shortage of skilled craftsmen in traditional carpentry and woodcarving, and of architects specialising in the conservation and restoration of historic buildings.

Discussion and Recommendations

(H6.1) Increased use of State Funds and Municipal Taxes to contribute to the costs of (i) the professional and supervisory activities of state and local self-government and (ii) the restoration and maintenance costs of monuments.

(H6.2) Tax concessions for owners of buildings/entrepreneurs who wish to undertake restoration work and of suppliers of special timber and other traditional materials (eg hand-crafted shingle roofing) and technologies.

(H6.3) Voluntary supplementary charges at hotels (with the receipts going to a special Hron Basin Heritage Fund, to be administered by a representative group of stakeholders) so that tourists help to pay for the protection and upkeep of the Hron Basin's natural and cultural heritage.

(H6.4) Charge or increase entry fees to selected monuments to help pay for restoration and maintenance.

(H6.5) Rapid provision of state funds for the most urgent repairs to Endangered Monuments, especially in Banska Stiavnica, Zarnovica and Ziar nad Hronom.

(H6.6) Investment in the restoration of key historic buildings and monuments with significant tourism potential (eg Slovenska Lupca Castle near Banska Bystrica and completion of the repairs to the reservoirs/tajchy and other components of the Banska Stiavnica water management system) and the development of associated visitor facilities, including interpretation.

(H6.7) Marketing programmes to promote tourism within the basin, especially by foreign visitors, to help increase the revenues for maintenance and restoration of cultural monuments.

(H6.8) Improve the skills of state and local self-government employees (especially *Kraj*, *Okres*, Institute of Monuments, *Mesto/Obec*), builders and developers and other interested parties (eg NGOs, students of architecture and art history), through a range of training, facilities, campaigns and programmes - including the promotion of international exchanges, seminars etc. In particular a School of Handicrafts should be considered, either within an existing technical training establishment or as a new enterprise, perhaps in a building that requires restoration eg at Banska Stiavnica.

(H6.9) Special training courses and licensing system for architects wishing to undertake design work on historic buildings/designated monuments.

Table S-2 The REMP-Core Plan

SUMMARY OF RECOMMENDATIONS : ISSUES, OBJECTIVES, TARGETS, MEASURES AND IMPLEMENTING AGENCIES

SURFACE WATER (SW)

GOAL: To improve surface water quality in the Hron River Basin, with all surface water for the Hron and its major tributaries attaining class III of the Slovak Water Quality Classification System (STN 75 7221), by 2010.

Issue	Objective	Target	Measures	Implementing Agency
(SW1) Lack of concrete strategic objectives of water quality compatible with E.U directives	Development of water quality objectives to guide the management of the river	By 2001. In conceptual materials EU Directives on water quality objectives should be taken into consideration.	(SW1.1) Cooperative programme to develop water quality strategic objectives according to expected uses.	SHMU, PH, MZP, StVak, ZsVak, NGOs (e.g. fishermen, watersports, Slovakia Peasants Union), SAZP, SIZP, MVO, MP,
(SW2) Domestic waste water treatment	Up-grade of sewerage systems coupled with the expansion of sewerage treatment plants and improvements in their operation to reduce BOD input into Hron	By 2005, 57% of inhabitants to be connected to efficiently working sewerage treatment system.	(SW2.1) The expansion of existing wastewater treatment plants and connection of all sewerage collectors to the Wastewater treatment plants at Banská Bystrica, Zvolen, Kremenica, Ziar nad Hronom and Levice.	StVak, ZsVak, MP, VUVH, Municipalities, MZP, SFZP
		By the end of 2000.	(SW2.2) Development and application of a decision making system for prioritising domestic sewerage system improvements* (SW2.3) A series of feasibility studies for rural areas where domestic sewerage systems are deemed to be a priority. These studies should seriously consider linking the sewerage systems of adjoining villages. Consideration should also be given to the use of reed-beds (and other biological methods) as a low cost means of treating rural/municipal wastewater.	StVak, ZsVak, MP, VUVH, Municipalities, MZP
		Produce 3 feasibility studies per year for domestic sewerage systems of different types, in priority areas, per year after the development and application of decision making system.		StVak, ZsVak, MP, VUVH, Municipalities, MZP

Issue	Objective	Target	Measures	Implementing Agency
		Detailed design within one year of feasibility study; construction within three years.	(SW2.4) The detailed design and construction of Waste Water Treatment facilities and connections in priority areas identified by decision making system and feasibility studies.	StVak, ZsVak, MP, VUVH, Municipalities, MZP
(SW3) Industrial waste water treatment	To ensure proposed industrial plant effluents meet international and national standards.	To be fed into the design stage of the industrial plant	(SW3.1) Risk assessment study of effluent industrial installations to minimise impact and chance of accidental releases to surface water.	Industry, SLZP, SHMU PH, MH, MH, VUVH
		Industrial plants' wastewater treatment systems effective enough to meet effluent standards set by Government Order 242/1993 up to the end of 2004 and EU Directive 91/271/EEC from 2005.	(SW3.2) Design and implementation of measures identified in Risk Assessment.	Industries, SLZP
	Improvement of industrial wastewater quality from each existing industrial plant.	Pollutants in existing Industrial plants' effluent should be reduced so as to comply with the Government Order No.242/1993 by 2002 and by 2005 with the EU Directive 91/271/EEC.	(SW3.3) Reduction of pollutants discharged from Biotika Slovenska Lupca, particularly organic pollution and the content of the ammonium ions through implementation of the project 'Ecologising Biotika'	Industry
			(SW3.4) In Bucina, Zvolen, improved treatment facilities for wastewater and solving of old loads liquidation (Slatina, Zolna) prior to discharge into the Hron to ensure compliance with the mentioned Slovak Order and EU Directive.	Industry

Issue	Objective	Target	Measures	Implementing Agency
		To meet National and International permitted levels. (Government Order 242/1993 by 2002 and EU Directive 91/227/EEC by 2005)	(SW3.5) Monitoring of effluent quality and reporting of results to SZP/Okres offices by the industries themselves to ensure compliance with standards occur.	Industry, SZP, PH, Okres offices, VUVH
(SW4) Institutional and legal framework	Changes to legal framework to ensure improvement in industrial effluent quality	Compliance by 2005	(SW4.1) Larger factories have to comply with the EU's IPPC (Integrated Pollution Prevention and Control) Directive 96/61/EC.	MZP, Industry, SZP, Okres office
		50% of small and medium industries by 2005	(SW4.2) Medium and small industries to establish Environmental Management Systems, certified under ISO 14 001.	MZP, Industry, SZP, Okres office
	Improvement and /or development of sewerage treatment system.	Institutional framework to enable co-operation between, or merging of, neighbouring municipalities for joint sewerage treatment system by 2000 so that this possibility can also be looked at in feasibility studies (see W1)	(SW4.3) Coordinated proceedings of local self-government to enable construction of sewerage treatment systems for municipalities that would not, on their own, be able to afford it.	MZP, Industry, SZP
	Interaction and data sharing between the many institutions involved in the water quality management of the Hron River Basin	By summer 2000, quarterly meetings each year.	(SW4.4) Establishment of a River Basin Management Coordination Commission as a Coordinating body. This Commission could also meet to discuss and agree priority actions and investment programmes.	MZP, PH, StVaK, ZsVaK, SHMU, SZP, SZU, SAZP, Mesto, Kraj/Okres, NGOs and Industry Representatives.

*NOTE: See Supporting Report for an example of a methodology for prioritising recommended measures

SOIL AND GROUND WATER (SG)

GOAL: To ensure that the quality of groundwater used for drinking and other purposes is in compliance with Slovak Standards, in order to protect human health and allow economic development of this resource on a sustainable basis.

Issue	Objective	Target	Measures	Implementing Agency
(SG1) Information on quality of shallow groundwater incomplete and out of date	Provide an up-to-date definition of those areas, where groundwater is used for drinking, that do not comply with Slovak Standards for Drinking Water	By end of 2000	(SG1.1) Conduct rapid assessment survey of shallow groundwater in Priority Areas as determined by 'physical' vulnerability and previous contamination	GSSR, SHMU, StVaK, ZsVaK, SZU
(SG2) Groundwater quality monitoring system inadequate (for detection of trends in vulnerable/ contaminated areas used for drinking and other purposes)	Improve groundwater quality monitoring network and reporting system in those vulnerable areas where contamination has been identified	By end of 2001 in Levice and Nove Zamky areas, end of 2002 elsewhere	(SG2.1) Establishment of New Groundwater Monitoring Points in Priority Areas as determined by (SG1), along with System to Analyse, Interpret and Report Monitoring Data – to Provide Feedback to Task Force (see SG3.1 below)	SHMU, GSSR
(SG3) Some settlements/households not connected to safe drinking water supply	Determine Priority Areas for Upgrading Public Water Supply to meet Slovak Standards	By end of 2000	(SG3.1) Establish Local Task Force 'Safe Drinking Water in the Hron Basin' to facilitate investigation and co-ordinate action	Municipalities, Okres, ZsVaK, StVaK, SHMU, SZU, SAZP
	Determine Priority Areas for Upgrading Public Water Supply to meet Slovak Standards	By end of 2000	(SG3.2) Development of System to Prioritise Areas for Connection to Public Water Supply; Gather Data and Apply the System to Hron Basin	SAZP, Municipalities, Okres, ZsVaK, (StVaK), SHMU, SZU
	To install Public Water Supply in Priority Areas	By end of 2002 in Levice and Nove Zamky areas, end of 2003 elsewhere	(SG3.3) Conduct Series of Feasibility and Detailed Design Studies for Water Supply to Priority Areas	StVaK, ZsVaK and Municipalities
	To install Public Water Supply in Priority Areas	By end of 2003 in Levice and Nove Zamky areas, end of 2004 elsewhere	(SG3.4) Construct Water Supply Systems in Priority Areas	StVaK, ZsVaK and Municipalities
(SG4) Suspected contamination of soil and groundwater with POPs	To determine the current condition of soil and groundwater with respect to contamination with POPs	By end of 2002	(SG4.1) Sampling and testing programme for POPs in soil and groundwater in vulnerable areas	SHMU, GSSR, VUPOP, SZU, SIZP, Banská Bystrica and Nitra Krai offices

Issue	Objective	Target	Measures	Implementing Agency
(SG5) Contamination of groundwater and soil in existing industrial areas and at old environmental loads (OEL)	As above and the prevention of further soil and groundwater contamination with POPs	By end of 2001	(SG4.2) In conjunction with SG4.1), a Survey/Audit of industries and other potential sources of POPs	Industries, SZP, SZU, Kraj offices and/or Okres offices
	The remediation of soil and groundwater contamination with POPs	Preparation by end of 2002, implementation phased 2003 to 2010	(SG4.3) Preparation and implementation of programme of VOC remediation measures in vulnerable areas (eg where water supplies are at risk)	Ministry of Economy, MZP, Industries, SZP, Kraj and/or Okres offices
	The prevention of soil and groundwater contamination with POPs	Preparation by end of 2002, implementation phased 2003 to 2010	(SG4.4) The preparation and implementation of measures to prevent soil and groundwater contamination with POPs	Ministry of Economy, MZP, Industries, SZP, Kraj and/or Okres offices
	Remediation of contaminated soil and groundwater in vulnerable areas and protection from further contamination	By end of 2002	(SG5.1) Comprehensive Review of Existing Studies and Databases on Contaminated Sites	MZP, GSSR, SZP, VUPOP, SHMU, Ministry of Economy, Industries
		By end of 2003	(SG5.2) Site Investigation Programme of Most Contaminated Sites and Design of Remediation (Clean-Up) and Protection Measures	MZP, GSSR, SZP, VUPOP, SHMU, Ministry of Economy, Industries
		Implementation phased 2003 to 2010	(SG5.3) Execution of the Remediation and Protection Programme at the Most Contaminated Sites	MZP, GSSR, SZP, VUPOP, SHMU, Ministry of Economy, Industries

AIR (A)

GOAL: To improve the ambient air quality in the Hron Basin so as to meet all the national air quality standards and for all stationary sources to comply with emission standards.

Issue	Objective	Target	Measures	Implementing Agency
(A1) A number of plants are still not able to meet the emission standards	Reduction of pollutant emissions from stationary sources not complying with the emission standards	All stationary sources to comply with the emission standards by 2006	(A1.1) Enforcement of the emission standards and emission charges to facilitate adoption of the Best Available Technology Not Entailing Excessive Costs by plant operators. (A1.2) Implementation of the existing "Programmes of Air Pollution Abatement" in Okres Banská Bystrica and Ziar nad Hronom	MZP SIZP Kray offices Okres offices Industries MZP SIZP Okres offices Industries
(A2) The NOX concentration exceeds the short-term air quality standards in the town of Banská Bystrica and heavy traffic roadside areas.	Reduction of ambient NOx levels in the town of Banská Bystrica and heavy traffic roadside areas	To achieve all the ambient air quality standards for NOx (annual, daily, half-hour)	(A1.1) and (A1.2) (A2.1) Complete gas supply to Banská Bystrica Mesto and surrounding Obec (*) (A2.2) Expansion of the trolley-bus system in Banská Bystrica Mesto (**) (*) (A2.3) Electrification of the rail section between Banská Bystrica and Zvolen (+) (**) (#) (A2.4) Comparative study on the construction of the north traffic bypass (+) (*) (#) and a polyfunctional tunnel, and implementation of the more advantageous option. (A2.5) De-NOx of exhaust gas at the cement factory	Municipalities Heating plants SAD-BB Slovak Railways MDPT Cement Works, BB

Issue	Objective	Target	Measures	Implementing Agency
(A3) The TSP concentration exceeds the long-term air quality standard in certain areas in the town of Banska Bystrica.	Reduction of ambient dust levels in the town of Banska Bystrica	To achieve all the ambient air quality standards for TSP (annual, daily, half-hour)	(A1.1) and (A1.2) (A3.1) Same as (A2.1) (*)	Municipalities Heating plants
(A4) The number of operable air quality monitoring stations is decreasing due to the budgetary shortage	To monitor any changes in the air quality that may have negative effects on the human health	To establish a most desirable and realistic air quality monitoring scheme by 2005	(A3.2) Planting of exposed soil areas (A4.1) Preparation of a phased monitoring plan for the whole country based on the review of the current state of air quality, present and expected future emission sources (stationary and mobile). The plan includes considerations on short - term spot monitoring, eg, by mobile stations, as a supplement to continuous monitoring. (A4.2) Implementation of the plan in order of urgency	Municipality MZP SHMU SAZP SZU

Note: (**) Included in the national, Kraj and Okres environmental action programmes.

(*) Priority in the Okres environmental action programme.

(+) Included in the Territorial Development Plan and a priority of Okres.

(#) Feasibility study including environmental impact assessment is necessary, if not done yet; these projects have not been justified on air quality grounds alone.

WASTE (W)

GOAL: To ensure that the methods and approaches adapted lead to the long term, effective management treatment, and disposal of solid waste within the Study Area, such that human health is safe-guarded, but using the waste as a resource where possible

Issue	Objective	Target	Measures	Implementing Agency
(W1.1) Waste Classification	Objective: to rationalise the waste classification system further, in order to simplify completion of the waste statistic forms	(W1.1) Simplification of the number of waste types, to avoid confusion for operators, with respect to the range of wastes for which statistical data are required	Continual review of the existing list waste types with a view to reducing the number of waste types within the statistical record.	MZP, SAZP (COH), SOSR
(W1.2) Creation of Waste Statistics	Objective: to develop a waste-disposal based statistical record, removing double-accounting for waste production figures and placing the onus on data collection in the hands of the waste disposal operators.	Create a database of waste disposal derived statistics, as well as from waste production figures, thereby requiring additional sources of accountable data. Disposalers as well as producers will become involved with the provision of long term statistical information.	(W1.2) Modification of legal requirement to require additional statistics to be provided by waste disposers as well as data being provided by waste producers	MZP, SAZP (COH), SOSR Kraj / Okres Authorities Waste Producers
(W1.3) Collation and Publication of Waste Statistics	Objective: under the control of the Ministry of Environment, for SAZP (COH) and SOSR, to rationalise the collection, collation and presentation of waste disposal statistics, so that one organisation takes responsibility for the management of the data, even if another publishes the information.	Develop SAZP (COH) as the single compiler of waste statistics, together with publication data in Partial Monitoring System, plus SOSR having responsible for publication of national statistics for waste	(W1.3) Establish a clear method for collection of waste statistics from producers or (later) disposers, so that unambiguous data are collected on the basis of a single waste questionnaire. Such a measure will require modification to the existing legislation, which may	MZP, SAZP (COH), SOSR

Issue	Objective	Target	Measures	Implementing Agency
(W2) Regional or Sub-regional Waste Plans	Objective: to develop a clear and quantified understanding of the future waste management requirements for the Study Area, either as a whole or on suitable sub-regional bases.	Derive costed integrated waste management strategies on a regional or sub-regional basis by 2001 for implementation by 2003	(W2.1) Produce strategic sub-regional waste management plans for all Okres in the Study Area by 2001, which consider future waste disposal requirements, including waste disposal sites and strategies. Financial considerations also evaluated through open discussions between adjacent authorities	Kraj / Okres Authorities Industrial Waste Producers
(W3) Old Environmental Loads	Objectives: to develop a prioritisation for the reclamation or removal of OELs.	i) Identify sites of greatest environmental risk, through a mix of chemical analyses and GIS-based reference to existing information files ii) compile a listing of all past and present waste disposal sites, utilising and updating the original GSSR database, supplemented with site investigations to determine the nature of waste content, supported by photographs, with an evaluation of the likely environmental risk of the site	(W3.1) i) Prepare a prioritisation list of sites that require to be reclaimed or removed ii) all Okres combine efforts and historical knowledge so as to provide the best starting-point for the exercise. Agreement should be reached on the prioritisation of sites to be reclaimed, and to work to securing appropriate funding, possibly from external agencies, eg. EU	MZP Kraj / Okres Authorities GSSR
(W4) Medical Incinerator Operation	Objective: to provide safe, effective treatment of medical wastes.	By the end of 1999, and by end of 2001 to handle the medical disposal needs for the Kraj and neighbouring Kraj if capacity allows; a similar facility may need to be established for Nitra Kraj	(W4.1) To complete commissioning of the newly constructed medical incinerator at Roosevelt Hospital in Banská Bystrica and ensure that it is made fully operational	Municipal Authority Hospital Authority MZP

Issue	Objective	Target	Measures	Implementing Agency
(W5) Monitoring of Landfill Sites	Objective: to establish a comprehensive monitoring programme for all major landfill facilities and OELs, in order to identify significant environmental risks in the Study Area.	Implement environmental monitoring for all major landfill sites (as per legislative requirements) together with coverage of OELs, by 2003	(W5.1) Establish a list of sites to be monitored together with a list of parameters to be assessed on an annual or bi-annual basis, together with a monitoring review programme, to ensure that collected data are used for future management of waste disposal sites.	Kraj / Okres Authorities, SAZP (COH), SHMU, SIZP
(W6.1) Alternative Waste Treatment	Objective: to improve public awareness with respect to waste recycling and improve industries adoption of waste minimisation, through educational programmes and realistic pricing mechanisms for waste disposal.	Encourage the general public to support community recycling programmes and industry to improve their reclamation and waste minimisation performance	(W6.1) Develop a range of public and industry awareness programmes with respect to waste recycling and minimisation respectively, with cost saving as a major feature	MZP Centre for Cleaner Production Kraj / Okres Authorities NGOs and Community Groups
(W6.2)	Objective: to identify alternative methods of waste treatment and re-use	Encourage the involvement of a wider range of institutions, to devise, amongst other things, commercially viable methods for waste re-use	(W6.2) Encourage the involvement of scientific and academic institutions in the research and identification of alternative means of waste recycling, re-use and treatment	MZP, GSSR, SAZP, MZP and SAV
(W7) Waste Transfer	Objective: to investigate the potential development of a rationalised waste handling and transport network within the Study Area.	Make municipalities and Okres aware of the needs to develop facilities suitable for the collection and segregation of community wastes, together with the establishment of a fleet of WDV (waste disposal vehicles) suitable for the transport of wastes to regional disposal sites	(W7.1) Review waste disposal requirements in the light of the costed WMP, so that location of disposal sites are known, together with distance to travel + quantity of waste. Determine the number of vehicles that will be necessary for the effective transport of wastes, assuming distance to disposal site is too great for existing small collection vehicles. Establish transfer stations with facilities to reclaim waste, after sorting. Propose strategic locations for such transfer stations	Ministry of Transport, Post and Telecommunications, Kraj / Okres Authorities Waste Disposal Operators

ECOLOGY (E)

GOAL: To improve the management measures for ecology and biodiversity in major aquatic and terrestrial ecosystems of the Hron basin.

Issue	Objective	Target	Measures	Implementing Agency
(E1) Forestry: ecologisation	Improve ecology and biodiversity in all forests	Continuation to 2004 of existing relevant research programmes	(E1.1) Extension of the LVU's research project on Conservation of the Biodiversity of Selected Forest Ecosystems and their Integrated Protection	LVU
		To increase the scope in 2000 of existing research programme to solve practical problems of ecologisation & biodiversity preservation.	(E1.2) To add to the above project an oak forest site Stiavnice Vrchy PLA and at least two other demonstration projects managed in a close-to-nature way.	LVU SAZP - COPK
			(E1.3) To add to the above project fauna biodiversity monitoring. And other monitoring in line w/act 7 of the Convention on Biological Diversity.	LVU SAZP - COPK
	Improve ecology and biodiversity in all forests (cont.)	Amended methodology by 2001 for preparing forest management plans, to be reviewed at regular intervals.	(E1.4) Incorporation of agreed additional forestry ecologisation measures derived from results to 1999 of research project in (E1.1) above and other relevant research projects to improve forest management practices.	MP-Forestry Section, LVU, Lesoprojekt, Regional Forest Authorities, MP, MZP

Issue	Objective	Target	Measures	Implementing Agency
(E2) Lower Hron valley: scarcity of protected areas and reduced biodiversity	Improved nature protection and conservation and landscape management	Amended methodology by 2006 for preparing forest management plans	(E1.5) Incorporation of additional forestry ecologisation measures derived from results to 2004 of extended research programme in (E1.1) above	As in (E1.4) above
		Inventory completed by 2000, Rehabilitation plans completed by 2000-2001, implementation between 2001 and 2010	(E1.6) Inventory of the condition of riparian belts, identify sections requiring urgent rehabilitation. Develop rehabilitation plans and implement them. See also 3.1	SAZP, State Environmental Authorities, LVU, PH, Local Government, other stakeholders
		Establishment by 2002 of forestry ecologisation demonstration sites	(E1.7) Selection of two sites (conifer, broad leaf in National Park and/or Protected Landscape Area) for close-to -nature forestry practices, including measures from (E1.1) to (E1.5) above	LVU, National Parks Administration, SAZP – COPK, Lesoprojekt, Regional Forest Authorities, users or owners
		By 2003 significantly extended network of protected areas	(E2.1) To locate and declare at least 10 good examples of forest, steppe and wetland habitats as Level II, III, IV or V protected areas	SAZP, National Parks Administration, Nitra Kraj and Okres environment sections
		By 2004 a significant extension of the USES planning network. Taking into account that M-USES plans have been developed for 20 Cadastrals already within the project "Evaluation of the ecological capability of the Ziar hollow region"	(E2.2) To prepare M-USES plans for 100 cadastrals and to have started/finished implementation of 25 of them	SAZP, Kraj, Okres and municipal/obec environmental authorities

Issue	Objective	Target	Measures	Implementing Agency
		By 2000 to have established a monitoring system of key animal and plant species and habitats, for recording status and changes in biodiversity	(E2.3) Identify the key species and implement agreed monitoring schedule measures to conservation and stabilisation of populations of rare and endangered organisms eg. <i>Hucho hucho</i> , and ensure migration of anadromous fish from the Danube up to Brezno.	SAZP-COPK
(E3) Hron river and dependent habitats: impacts of river engineering	Use of knowledge gained from the past development of the Hron river for improving present and future management of the river and wetland habitats	Identification by 2001 of negative impacts of river management and necessary remedial measures	(E3.1) To complete a study of environmental impacts of Hron river engineering projects which also identifies ecosystem revitalization projects and prepares guidelines for minimizing impacts of future projects	PH, SAZP, MP, VUVH, SVP.
		Mitigation of effects of barrages across the Hron river	(E3.2) Implementation of existing plans to construct the Veľké Kozmaloce fish pass and other existing plans for the Hron River revitalisation.	PH, MP, SVP, SAZP, VUVH
(E4) National Parks and Protected Landscape Areas: lack of management plans	Improved management for ecology and biodiversity	Preparation of management plans for major protected areas by 2002	(E4.1) Preparation of detailed management plans for Nízke Tatry and Muranska Planina NPs and Veľká Fatra, Štiavnicke Vrchy, Ponitrie and Poľana PLAs	National Parks Administration, SAZP-COPK, LVU, Lesoprojekt, MZP, PLA Administration, other scientific and research organisations.

HERITAGE (H)

GOAL: The protection and improved management of major tourism and heritage resources as the basis for their sustainable use and economic development.

Issue	Objective	Target	Measures	Implementing Agency
(H1) National parks and protected landscape areas: lack of tourism development plans	Improved management of tourism in NPs and PLAs	Preparation of tourism developments plans for key areas by 2002	(H1.1) Preparation of tourism plans for Nizke Tatry and Muranska Planina NPs and Vel'ka Fatra and Pol'ana PLAs (H1.2) Preparation of detailed plan for forest-based tourism at one site in a PLA or NP	MZP (National Parks Administration and COPK) with Okres Forest Section, Municipality, Lesoprojekt and other key stakeholders
(H2) Caves: lack of full protection	Improved protection and management of caves	Implementation by 2001 of legislation expected in 2000	(H2.1) Establishment of protection zones around 10 of the Hron's most important caves (H2.2) Within six months of legislation, notification of all the Hron cave sites to Kraj and Okres territorial development offices	Okres Forest Section in association with COPK or National Parks Administration etc as for H1.1 Slovak Caves Administration Slovak Caves Administration
(H3) Hron river: poor microbiological water quality	Water quality suitable for all water contact sports	Improvement of Hron river to at least Class III microbiological standard by 2005	(H3.1) Improved quality of wastewater emissions See Chapter 5.2.4	MZP, MP, StVak, ZsVaK, PH, Kraj and Okres environment and health sections
(H4) Negative effects of economic change on listed monuments	Protection of Cultural Heritage from Negative effects of economic change	Preparation of Management Plans for Key Areas by 2003	(H4.1) Preparation of Management Plans for Banska Stiavnica WHS and all Monument Reserves and Zones	SAZP, Institute of Monuments, Kraj, Okres and Mesto
	As above and to ensure consensus on the management proposals and priorities	End of year 2000	(H4.2) Establishment of Permanent Working Groups for each WHS, Monument Reserve and Zone	SAZP, Institute of Monuments, Kraj, Okres, Mesto, NGOs

Issue	Objective	Target	Measures	Implementing Agency
		End of year 2001	(H4.3) Strategy and Action plan for Cultural and Rural Tourism in the Hron Basin	Ministries of Agriculture, Environment, Economy, and Culture, SAPARD
(H5) Deficiencies in institutional system and legislation for the protection of monuments	Improve decisions and actions by state and self-government administrators	End of year 2000 and ongoing	(H5.1) Programme to Improve Awareness, of the Public and Decision-makers	Ministries of Culture, Economy and Environment
	To streamline and strengthen legislation and procedures for the protection of monuments	Legislation revised by end of 2000	(H5.2) Revision of Legislation for Protection of Monuments	Ministry of Culture
		Technical Standards revised by end of 2000	(H5.3) Harmonisation of Technical Standards with Monument Legislation	Ministries of Culture, Environment and Interior
(H6) Monument protection and development: resource and skill shortages	Stricter Monitoring and Enforcement of Conservation Consents	Year 2000 onwards	(H5.4) Agreements to improve co-ordination between Institute of Monuments and <i>Okres</i> staff	<i>Okres</i> Offices and Institute of Monuments
	Increase the available funds for conservation	Year 2001 onwards	(H6.1) Increased use of State Funds and Municipal Taxes to fund the management and maintenance of Monuments	Ministry of Finance, <i>Mesto/Obec</i>
	Increase the available funds for conservation	Year 2001 onwards	(H6.2) Tax concessions for monument owners and suppliers of restoration services and materials	Ministry of Finance
	Increase the available funds for conservation	End of year 2000	(H6.3) Establishment of Hron Basin Heritage Fund, to be fed by Voluntary Supplementary Charges at Hotels and other sources	Various stakeholders, including State Government, <i>Mesto</i> , <i>Obec</i> , NGOs, Hotel Associations etc
	Increase the available funds for conservation	End of year 2000	(H6.4) Charge or increase entry fees to selected monuments, based on review of existing charges	Ministry of Culture and other responsible authorities

Issue	Objective	Target	Measures	Implementing Agency
	Ensure the conservation / integrity of the most Endangered Monuments	Provision of state and/or other funds by 2001 for the most urgent repairs to Endangered Monuments	(H6.5) Repairs to Endangered Monuments, especially in Banská Stiavnica, Zarnovica and Ziar nad Hronom	Ministry of Culture, Donors, Investors
	Promote tourism development within the basin	Complete the restoration and development for tourism of one historic monument by the end of 2002 and one per year onwards	(H6.6) The restoration of key historic buildings and monuments with significant tourism potential (eg Slovenska Lupca Castle near Banská Bystrica, reservoirs / <i>tajchy</i> at Banská Stiavnica) and the development of associated visitor facilities.	Ministry of Culture, Ministry of Economy, MP, PH
	Promote tourism development within the basin	Year 2001 onwards	(H6.7) Marketing programmes to promote tourism within the basin	Ministry of Economy, Regional Tourism Associations
	Improve the skills of state and local self-government employees, builders, developers etc involved in Monument Conservation	Year 2001 onwards	(H6.8) Training facilities, campaigns and programmes – including the promotion of international exchanges, seminars etc	Ministry of Culture
	As above	Year 2002 onwards	(H6.9) Training courses and licensing system for architects working on historic buildings	Ministry of Culture