

(8) Fish and Fishing

A total of 52 fish species (46 lowland, 6 montane) have been recorded from the Hron river, making it one of the most biodiverse rivers in central Europe (Ref. 4-54). The river can be divided into three ecological zones - a short montane section from the source to Svermova (10 km downstream of Telgart), a long sub-montane section to Kalna nad Hronom and a lowland section to the Hron's confluence with the Danube at Sturovo. Many tributaries also belong to the montane ecological zone, particularly those in the upper and middle reaches of the Hron.

In the montane section salmonid fish are dominant, with the natural occurrence of brown trout (*Salmo trutta v. fario*) and introduced occurrence of rainbow trout (*Salmo gairdneri*) and grayling (*Thymallus thymallus*). In the submontane section, upstream of Banska Bystrica, the dominant species are grayling, chub (*Leuciscus cephalus*) and sneep (*Chondrostoma nasus*). Between Dubrova and Zvolen the dominants are grayling, rainbow trout and Danubian trout (*Salmo hucho*). Downstream of Zvolen the most common fish are barbel (*Barbus barbus*), sneep, chub, eel (*Anguilla anguilla*) and vimba (*Vimba vimba*). Between Zarnovica and Nova Bana, economically valuable species such as carp (*Cyprinus carpio*), pike (*Esox lucius*) and pike-perch (*Lucioperca lucioperca*) are also abundant, and become increasingly so downstream. Accompanying species are the goby (*Gobio albipinnatus*), bleak (*Alburnus alburnus*), stone loach (*Nemacheilus barbatus*), roach (*Rutilus rutilus*) and perch (*Perca fluviatilis*).

Downstream of Kalna, bream (*Abramis sp*) become the most dominant, along with chub and asp (*Aspius aspius*). Most species found in the sub-montane zone also occur in the lower Hron, but the five salmonid species are absent. Sturgeon (*Acipenser*) used to occur in the Hron, but have not been seen for at least a century. Rare and endangered fish are also found in the Hron; 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.

Water quality in the Hron river has generally improved in recent years. However, pollution incidents do occur, most recently in 1998 when an industrial chemical spillage from a factory north of Banska Bystrica resulted in a fish kill over several kilometres of river. In earlier decades (1940s to 1970s) pollution incidents (spillages and discharges from industry, municipal sewage discharges) were more numerous and serious and resulted in major fish kills and generalised reductions in fish populations. Downstream of the chemical industries in Dubrova, more than nine kilometres of the Hron had no fish at all from the 1940s to the 1980s. In the 20 km above Banska Bystrica and the river down to Zvolen, fish populations were much reduced for many

decades due to pollution. Conditions are now much improved, and salmonid fish have re-colonised these parts of the Hron.

Of the 46 lowland fish species occurring in the Hron, 29 migrate along the river for feeding, breeding or dispersion. Some species migrate long distances (more than 100 km) eg bream, vimba, barbel and pike-perch. Others migrate over distances rarely exceeding 20 km eg carp, asp, pike and wels (*Silurus glanis*).

A large number (20) of the lowland fish species belong to IUCN categories of threatened species. Of these three the wild carp (*Cyprinus carpio*), Kessler's gudgeon (*Gobio kessleri*) and the zingel (*Zingel zingel*) are Category E (Endangered). Of the remainder, five are Vulnerable (V), five are Rare (R) and seven are Indeterminate (I).

Fishing is a popular recreational sport along the Hron river and throughout Slovakia and is highly organised by the Slovak Fishing Union, a non-governmental organisation based in Zilina. All fishermen must join in order to receive a fishing permit. Nationally it had 75 323 adults and 23 567 youth members in 1997. Members belong to their local fishing association which operates and regulates fishing activities along its designated stretch of river. The Hron river has 10 associations along its length from Sturovo to Brezno, with 5 960 members in 1998. In order to continue their annual membership, fishermen complete and return an annual fish catch return, through which the Slovak Fishing Union compiles statistical data on fish catches. These are summarised in Table 5.5-23 for the Hron river.

In total, more than 22 species are regularly caught in the Hron. The most abundantly caught fish are brown trout, rainbow trout and grayling (upper Hron), brown trout and chub (middle Hron) and common carp, bream, chub, rase, barbel and zahrte in the slower flowing lower Hron.

The Slovak Fishing Union is an active manager of fish stocks in the Hron basin. It operates one fish farm in the valley (at Pariz L'uba, near Sturovo), and 17 others throughout Slovakia. Large numbers of fish are bred in these farms and released into rivers for re-stocking them. In 1998, the following numbers of fish were released into the Hron and its tributaries: common carp, 5 000; pike, 3 500; pike-perch, 3 000; wels catfish, 1 000; nase, 44 700; huchen, 300; brown trout, 90 000; rainbow trout, 5 011; grayling, 55 000. The young fish (fry) particularly the salmonids, are released into the smallest streams in the upper and middle reaches of the Hron. After about two years, the surviving fish are caught by electro-fishing and transferred to larger tributaries. These activities are carried out by local members, who voluntarily protect and maintain the tributaries in their area.

Table 5.5 - 23 Hron River Fish Catch Returns for 1998

Fish Species	Fishing Association and Annual Catch (numbers)										Total
	1	2	3	4	5	6	7	8	9	10	
Common carp	83	1103	1817	295		22	27	28			2 375
Tench		8	1	12				31			52
Common bream	362	870	1981	151		103	8	5			3 480
Chub	247	358	2128	704	80	3190	292	6	69	18	7 092
Nase	179	2101	2746	172		651	37	10	1		5 897
Barbel	101	583	1692	58		108	10	7			2 559
Zahrte	17	1265	2665	81		236		1			4 265
Crucian carp	198	1613	1101	23		7	1				2 943
Asp		53	176	1		98					328
Bighead, grass and silver carps	23	27	73	1							124
Northern pike	25	108	429	20		19	11	11	17		640
Pike perch	24	95	179	5		1					304
Wels catfish		37	69	17							123
Perch	10	90	35			524	34				693
Burbot	299	162	203								664
Brown Trout				297	851	2850	88	2786	5663	1246	13 781
Rainbow Trout				52		133	1	423	4683	266	5 554
Grayling				2		14	30	1251	2195	5864	9 356
Brook trout				6		42		1			49
Huchen								5	7	1	13
Others		37	1450			1759	177				3 423

Source: Slovak Fishing Union

- 1: Sturovo
- 2: Zelizovce
- 3: Levice
- 4: Nova Bana
- 5: Zarnovica

- 6: Ziar nad Hronom
- 7: Zvolen
- 8: Banska Bystrica
- 9: Podbrezova
- 10: Brezno

5.5.3 MANAGEMENT OF ECOLOGY AND BIODIVERSITY – LEGAL AND INSTITUTIONAL SYSTEMS

The Ministry of Environment is generally responsible for the management of ecology and biodiversity in Slovakia and the principal legislation by which it does this is Act No. 287/1994 *On Nature and Landscape Protection*. The main functions of the MoE under this Act are:

- supervision of nature and landscape protection;
- designation of all Levels II, III, IV and V protected areas;
- development of the General Framework of the Territorial System of Ecological Stability (USES);
- preparation of management plans for all levels of protected areas;
- organisation of rescue programmes for critically endangered protected species;
- establishment and management of nature protection agencies, principally the Centre for Nature and Landscape Protection of the Slovak Environment Agency and the National Parks Administration;
- designation and protection of endangered, rare, precious or other significant species of animals and plants;
- participation in international programmes and conventions concerned with nature and landscape protection.

The different levels of protected areas in Slovakia are described in Chapter 5.5.2. The Centre for Nature and Landscape Protection (COPK) is responsible for the designation and Management of protected landscape areas (Level II) and for all Levels IV and V areas (protected sites, nature reserves and nature monuments). It is also responsible for programmes and activities for the designation and management of protected species of fauna and flora. The COPK's head office is in Banska Bystrica from where the Hron Basin's Levels II, IV and V protected areas and protected species programmes are developed and supervised. The basin's main protected landscape areas at Pol'ana, Vel'ka Fatra and Stiavnicke Vrchy are managed from regional COPK offices in Zvolen, Vrutky and Banska Stiavnicke respectively. The National Parks Administration is based at Liptovsky Mikulas, where the director is located. The Hron's two main national parks of Nizke Tatry and Muranska Planina are administered from offices located in Banska Bystrica and Revuca respectively.

The Ministry of Environment is also responsible for the implementation of five international conventions, all of which are important for providing additional protection of Slovakia's ecology and biodiversity:

- Convention on Wetlands of International Importance Especially as Waterfowl Habitats (the Ramsar Convention, joined 1990);
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (The CITES Convention, joined 1992);
- Convention on Biological Diversity (joined 1993);
- Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention, joined 1995);
- Convention on the Conservation of European Wildlife and Natural Habitats (The Bern Convention, joined 1996).

Forestry legislation and activities are also important factors in influencing ecology and biodiversity, particularly in forested areas and associated habitats such as grasslands and wetlands. The two principal pieces of legislation are the *Act on Forests* (No. 61/1977) as modified by Act No. 229/1991 and Act No. 183/1993 and the *Act on the Management in Forests and State Administration of Forestry* (No. 100/1997). The former states that:

The forests belong to one of the biggest riches of our country, they are one of the basic components of the environment. Forests influence and improve the climate, water and soil communities, preserve national beauty and are a source of health and refreshment for the population. In order to preserve all these forest functions it is necessary to protect the forest resources and at the same time to care permanently and following the plan for improvement of forests, manage them applying progressive technology and economic principles.

The latter Act establishes the procedures for preparing forestry management plans, the principal mechanism by which forests are managed for all their many functions, and states:

In all forests regardless of size and administration (ownership, use) a planned management must be applied to ensure and improve the functions of forests with maintaining the permanent effects of forests and creating the prerequisites for the rationalisation of forestry. Forest management serves those purposes and forest management plans are its results.

The methodology for preparing forestry management plans is described in Chapter 5.5.2. At the present time the trend is for forestry practices to become more ecological in order to improve the ecology and biodiversity of forested areas. According to the 1996 *Report on Forestry in the Slovak Republic (Green Report)*:

The aim of ecologisation is the creation of optimal mutual relations between all ecosystem components and the environment. This is related to maintaining ecological stability and biodiversity in the interests of sustained fulfilment of production and social functions of forestry. Forest ecosystems should be created to provide integrated functions without detriment to their ecotope.

The Institute of Forest Management Planning (Lesoprojekt, based in Zvolen) of the Ministry of Agriculture, Food, Forestry and Water Management is the authority responsible for preparing forestry management plans. These plans are reviewed by the National Parks Administration and the COPK, who have therefore the ability to comment on them and recommend any amendments to improve their effects on ecology and biodiversity. Such recommendations may not however be accepted. Undoubtedly the forest authorities are mainly responsible for determining the management practices of the forested lands of the national parks and protected landscape areas. Forest management plans for the Hron basin are approved by the forest sections of the Kraj regional offices in Banska Bystrica and Nitra. These offices, along with the forest sections of the Okres offices, are also responsible for ensuring the plans are properly implemented and that forestry laws are observed.

Medium and short term intentions of forest policy include the following measures (Ref.4-49):

- support to shelter wood and selection system and reduction of clear felling system;
- development of public beneficial forest functions;
- support to forest science and research;
- harmonization and integration of forest policy and policy of nature and landscape protection.

There is sometimes conflict between the MoE and the national and regional forestry authorities of the Hron basin over the level of provisions for ecology and biodiversity in the management of forests. This is due to the fact that a very high proportion of the area's forest lands are either national park or protected landscape areas, whose primary designated role as these is to maintain and improve ecology and biodiversity. Nearly all such forested lands (and especially commercial forests) are also managed for timber production via forestry management plans. Some conflicts are therefore inevitable, despite the consultation process during the preparation of the plans. It is only through the increasing ecologisation of forestry, as is current forestry policy, that such conflicts can be resolved and acceptable compromises reached by both the environment and forest authorities.

The Slovak Environment Agency (COPK Section) and the National Parks Administration do not have the necessary financial or staff resources to fully carry out all their responsibilities.

5.5.4 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 (Chapter 5.3.1). Additionally, up to 70% of the air pollution in Slovakia is from sources outside the country (Ref. 4-48). 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.

At the present time 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 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 and is extensively discussed in Chapters 5.1 and 5.2.

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. The Slovak Fishing Union now reports that water pollution has a significant adverse effects on the fish populations of the Hron. Accordingly, remedial actions to improve water quality are a priority for fish ecology and biodiversity issues. However the data from the Slovak Fishing Union is collected for long stretches of river and it is possible that there are localized areas near polluting sources Banska Bystrica sewage outfall where pollution is affecting fish populations. In addition, there have been several incidences where the release of pollutants into the environment has 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. Given that fish populations are apparently healthy, any such effects are not likely to be significant, although localised effects may exist near pollution in flows.

(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 (Refs. 4-47, 4-48, 4-49). The Forest Sections medium and short term policy intentions for ecologisation and integration with nature and landscape protection are given in Section 5.5.3.

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 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. The seven research projects are:

- *Assessment of forest biodiversity*: to establish and validate a system for forest biodiversity assessment;
- *Factors influencing forestry biodiversity*: roles of pests, diseases, natural disasters, air pollution and silvicultural systems on biodiversity;
- *Strategies of biodiversity conservation*: a review of national and international procedures for maintaining and managing biodiversity;
- *Protection of forests against human and abiotic harmful factors*: development of silvicultural and management guidelines to protect forests from air pollution, wind, snow, drought, extreme temperatures;
- *Protection of forests against pests, diseases and game management*: development of silvicultural and management guidelines for protection against these agents;
- *Models of integrated forest protection*: development of integrated proposals for forest management, to include all main factors with significant impact on forest health and stability;
- *Ecological stability of forest ecosystems*: development of methods to assess forest ecological stability and incorporation into forest management planning.

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 Stiavnicke 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 done by the various agencies with major interests in managing and developing the Hron basin's forests:

- Forest Research Institute;
- Lesoprojekt;
- Nizke 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 (Section 5.6.4)

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/cadastre 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 further effects, 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. The study and guidelines preparation could be undertaken jointly by the Slovak Environment Agency and Povodie Hrona.

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) Protected Areas Management Plans

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.

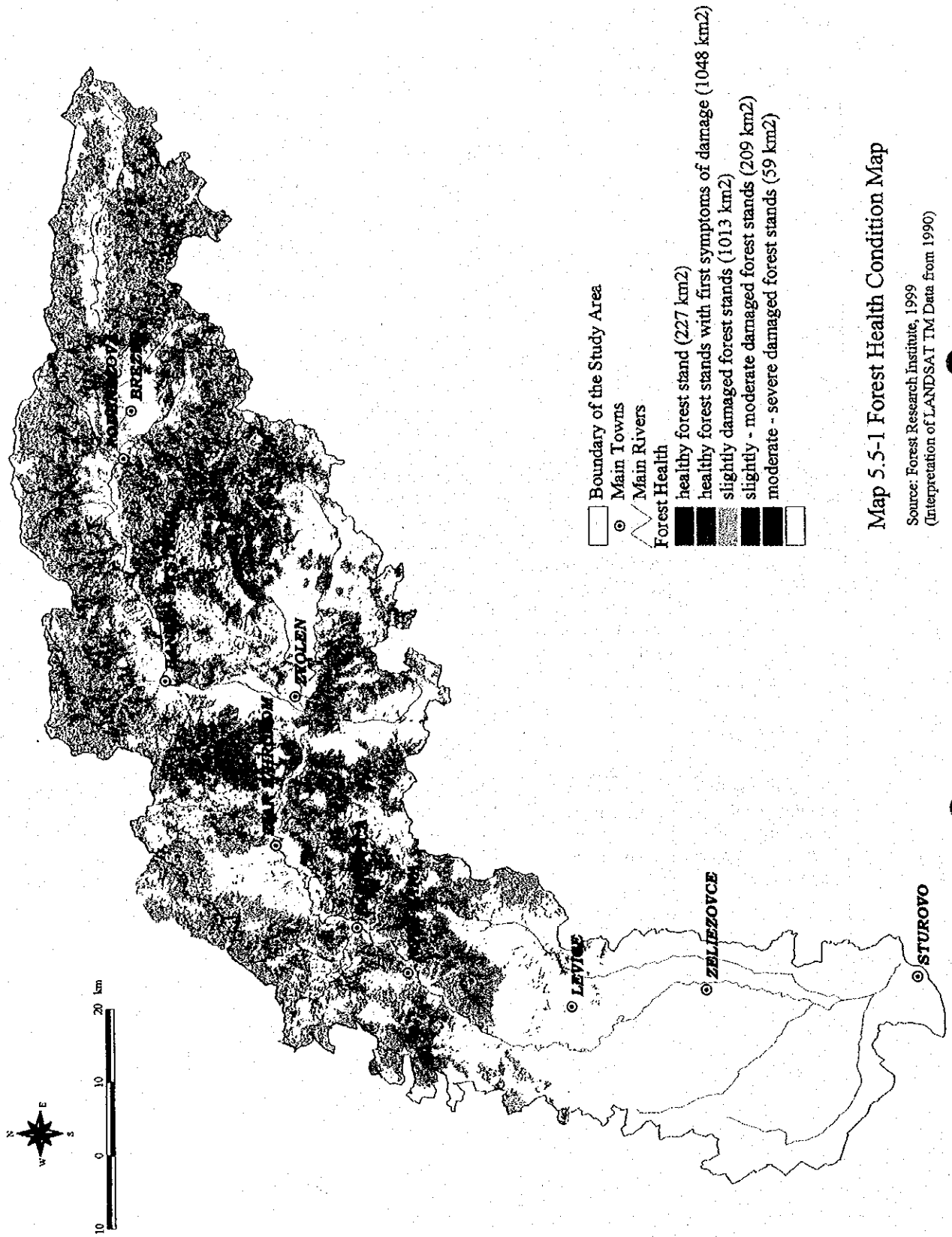
(7) **Summary List of Recommendations**

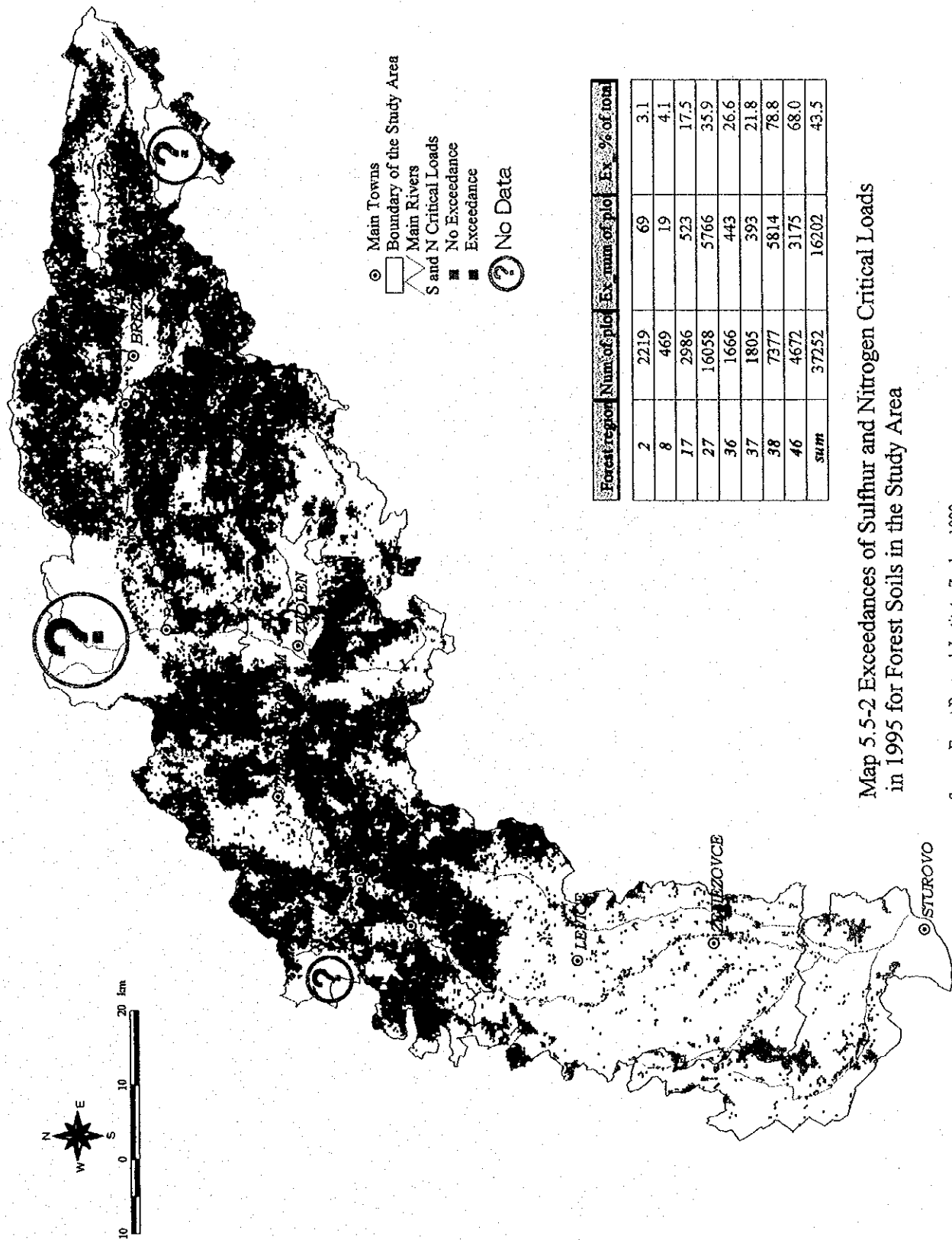
The goal of all recommendations is to improve the management measures for ecology and biodiversity in major aquatic and terrestrial ecosystems of the Hron basin.

Table 5.5 - 24 Summary List of Objectives and Recommendations

Sector and issue	Objective	Target	Measures	Key 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	(E1.2) To add to the above project an oak forest site Stjavnicke Vrchy PLA	LVU SAZP – COPK
			(E1.3) To add to the above project fauna biodiversity monitoring	LVU SAZP – COPK
		Amended methodology by 2001 for preparing forest management plans	(E1.4) Incorporation of agreed additional forestry ecologisation measures derived from results to 1999 of research project in (E1.1) above	MP-Forestry Section, LVU, Lesoprojekt, MZP, Regional Forest Authorities
		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.	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 of close-to-nature forestry practices, including measures form (E1.1) to (E1.5) above	LVU, National Parks Administration, COPK, Lesoprojekt, Regional Forest Authorities

Sector and Issue	Objective	Target	Measures	Key Agency
(E2) Lower Hron Valley: scarcity of protected areas and reduced biodiversity	Improved nature protection and conservation and landscape management	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	(E2.2) To prepare M-USES plans for 100 cadastres and to have started/finished implementation of 25 of them	SAZP, Kraj, Okres and municipal/obec environmental authorities
		By 2000 to have established a monitoring system of key animal and plant species for recording status and changes in biodiversity	(E2.3) Identify the key species and implement agreed monitoring schedule	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
		Mitigation of effects of barrages across the Hron river	(E3.2) Implementation of existing plans to construct the Vel'ke Kozmalovce fish pass	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 Nizke Tatry and Muranska Planina NPs and Vel'ka Fatra, Stiavnicke Vrchy, Ponitrie and Pol'ana PLAs	National Parks Administration, SAZP-COPK, LVU, Lesoprojekt, MZP, PLA Administration, other scientific and research organizations

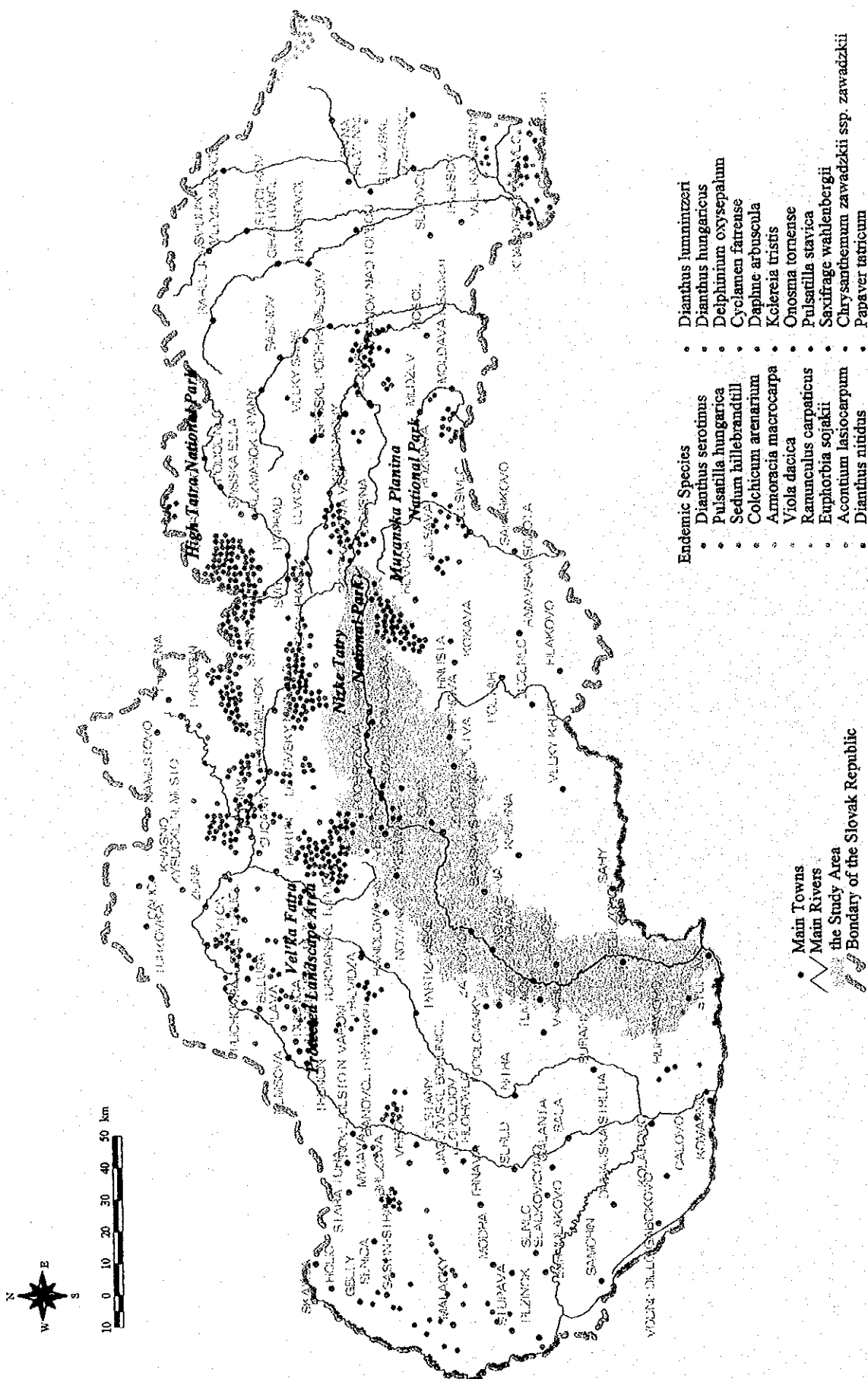


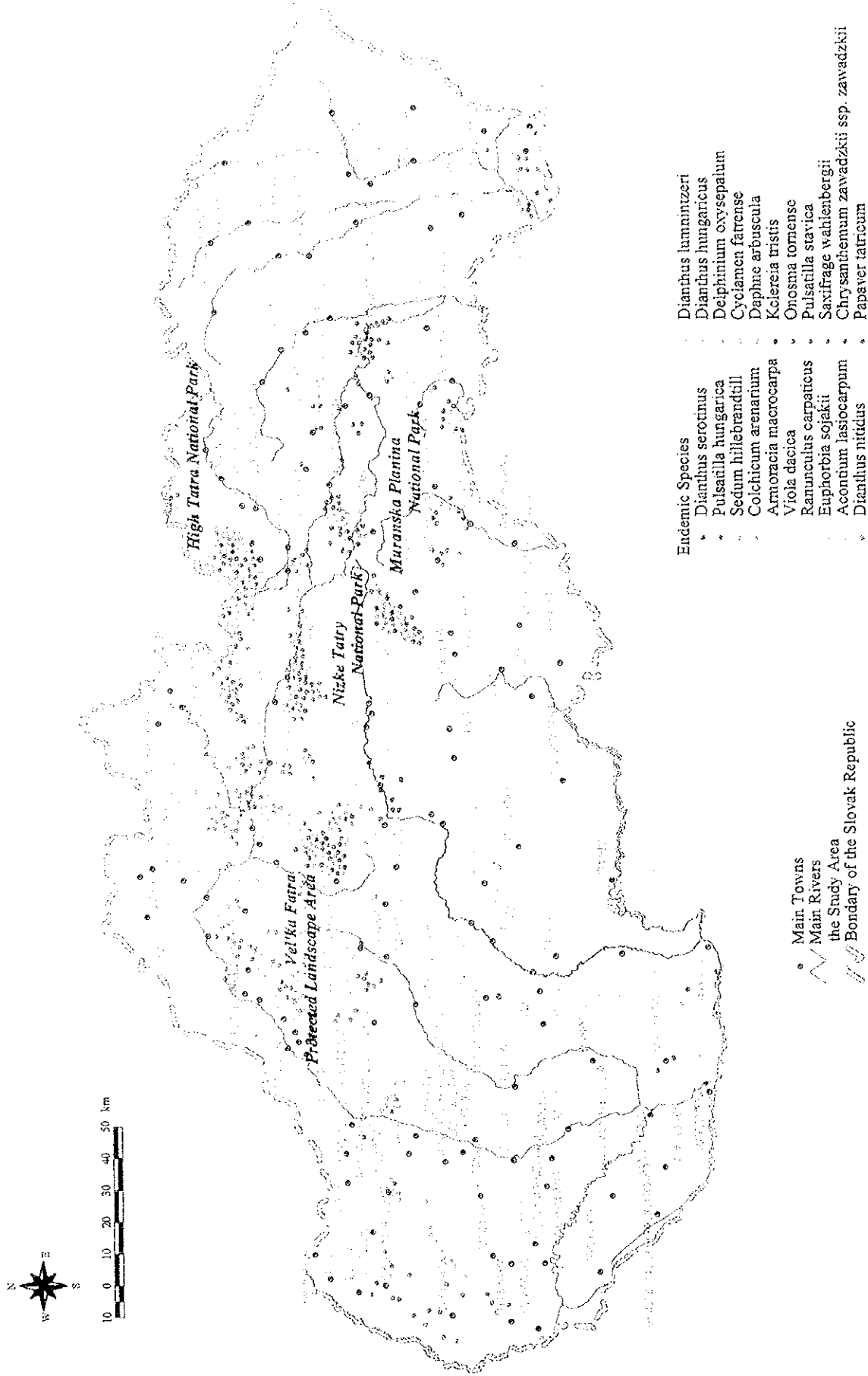


Forest region	Num. of plots	Ex. num. of plots	Ex. % of total
2	2219	69	3.1
8	469	19	4.1
17	2986	523	17.5
27	16058	5766	35.9
36	1666	443	26.6
37	1805	393	21.8
38	7377	5814	78.8
46	4672	3175	68.0
sum	37252	16202	43.5

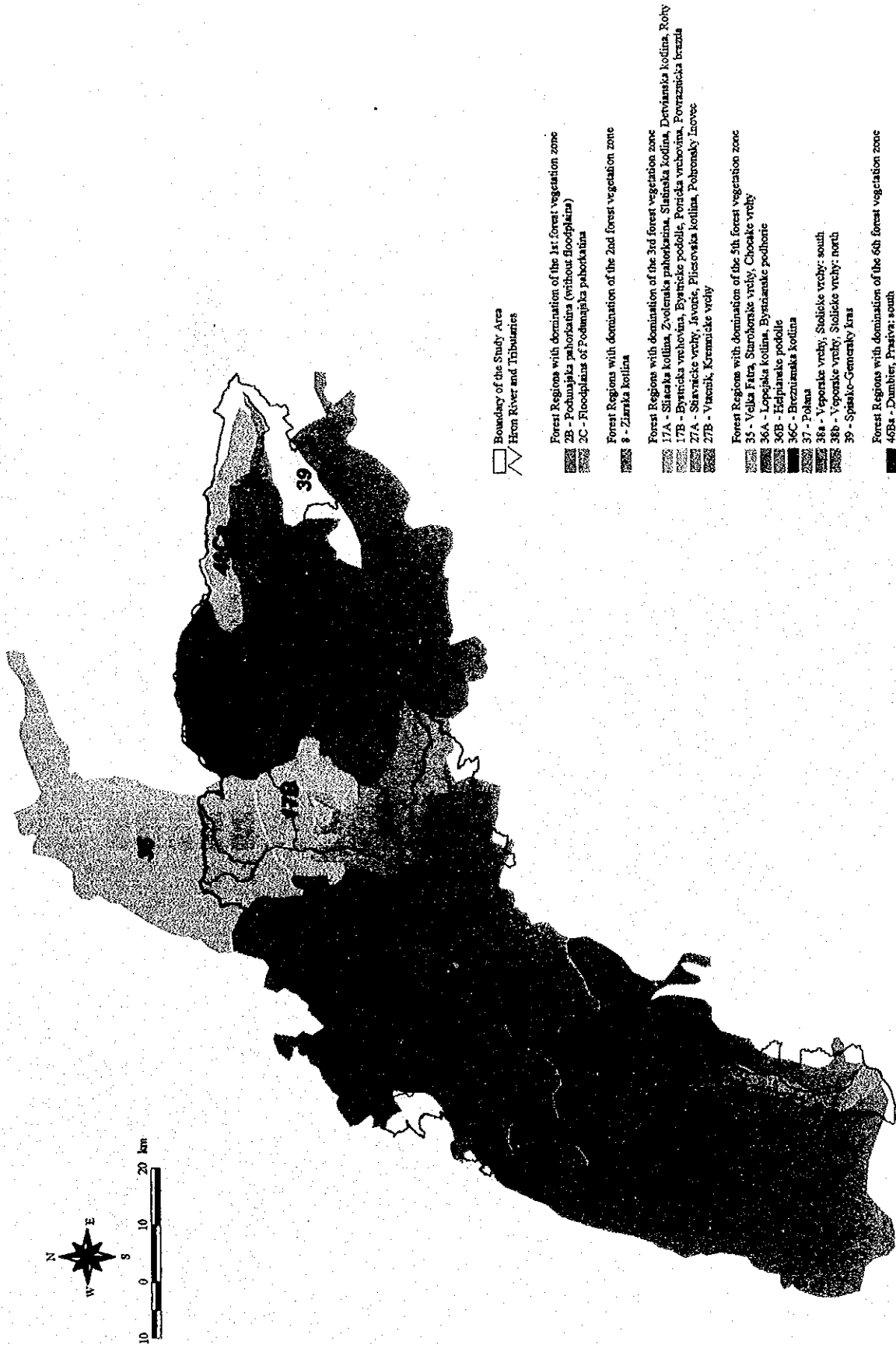
Map 5.5-2 Exceedances of Sulfur and Nitrogen Critical Loads in 1995 for Forest Soils in the Study Area

Source: Forest Research Institute, Zvolen, 1999





Map 5.5-3 Distribution of Endemic Species in Slovakia

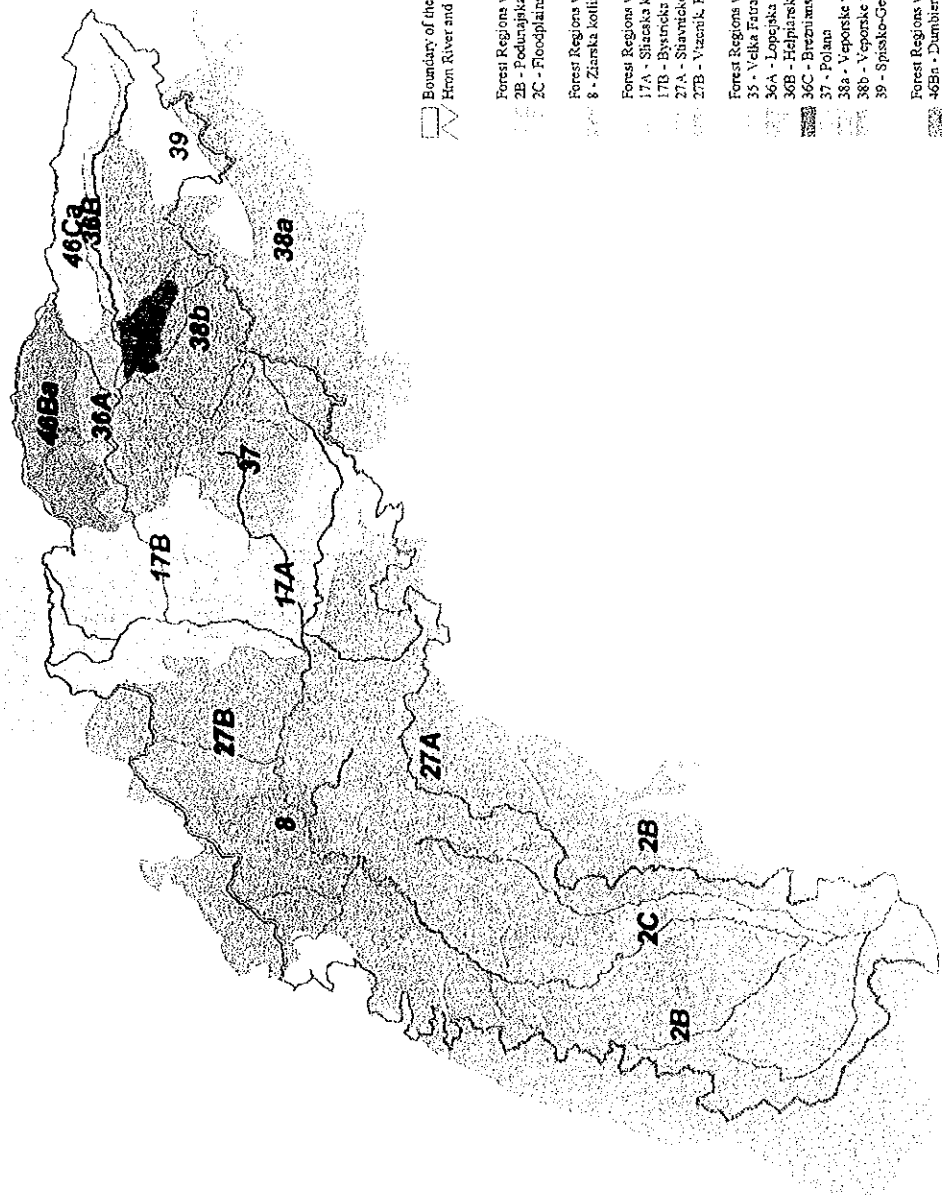


Map 5.5-4 Forest Regions

Source: SAZP GIS Laboratory, 1998



35



Boundary of the Study Area
 Horn River and Tributaries

Forest Regions with domination of the 1st forest vegetation zone

2B - Podurajska pahorkatina (without floodplains)
 2C - Floodplains of Podurajska pahorkatina

Forest Regions with domination of the 2nd forest vegetation zone

8 - Ziarcka kotlina

Forest Regions with domination of the 3rd forest vegetation zone

17A - Sitavska kotlina, Zvolenska pahorkatina, Slanska nadina, Devianska kotlina, Rohy

17B - Bystricka vrchovina, Bysnicka podolia, Ponicka vrchovina, Povraznicka brazda

27A - Slavtiske vrchy, Javorie, Pilsavska kotlina, Pohronsky Inovec

27B - Vaznik, Kremnickie vrchy

Forest Regions with domination of the 5th forest vegetation zone

35 - Velka Fatra, Starohorske vrchy, Choceke vrchy

36A - Lopicjska kotlina, Bysmanske podcane

36B - Hrdpanske podolie

36C - Breznianska kotlina

37 - Polana

38a - Veporske vrchy, Stoliske vrchy: south

38b - Veporske vrchy: Stoliske vrchy: north

39 - Spissko-Oremsky vrch

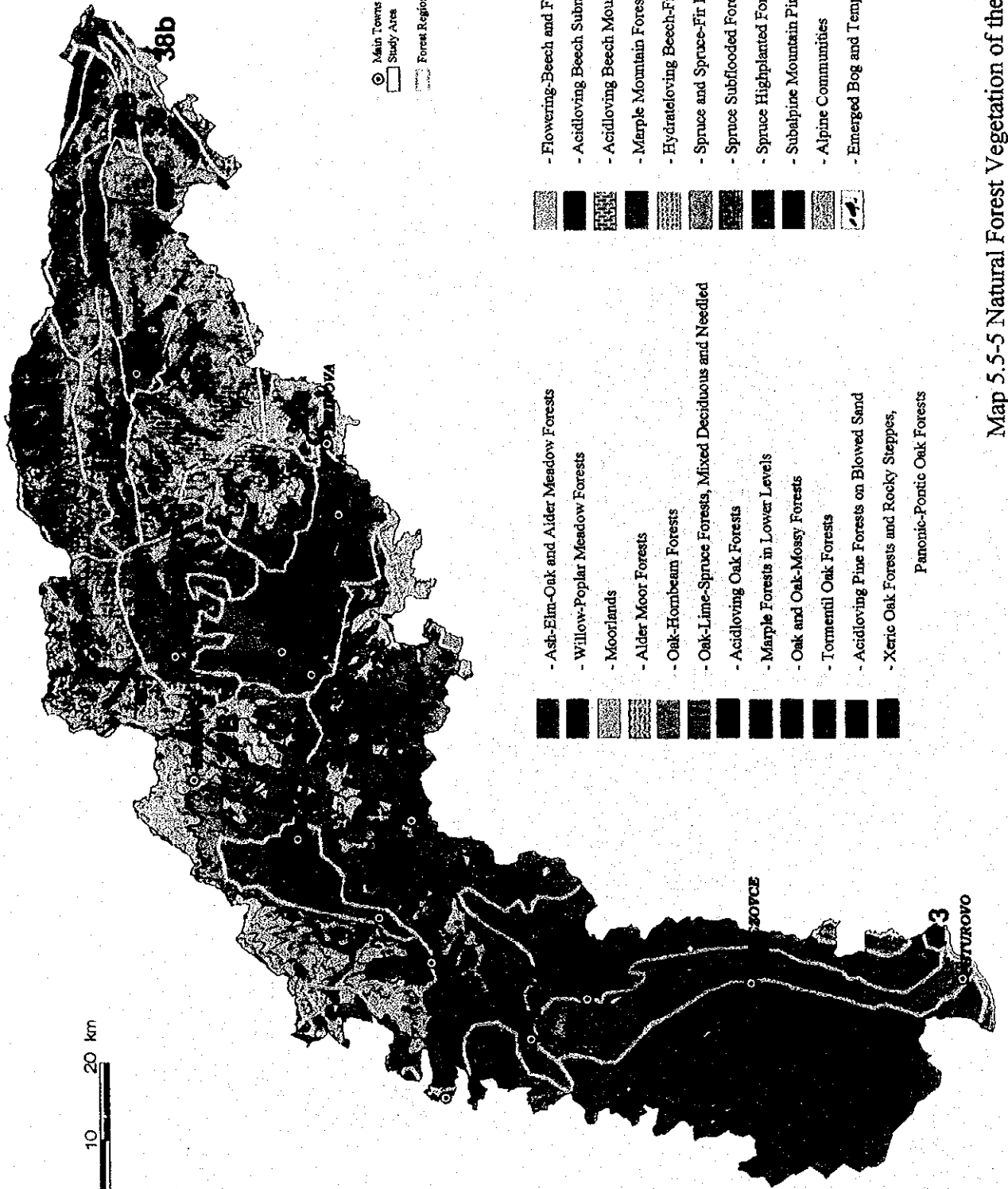
Forest Regions with domination of the 6th forest vegetation zone

46Ba - Dumbier, Prasiva: south

46Ca - Kralovi hola, Prichyba: south

Map 5.5-4 Forest Regions

Source: SAZP GIS Laboratory, 1998

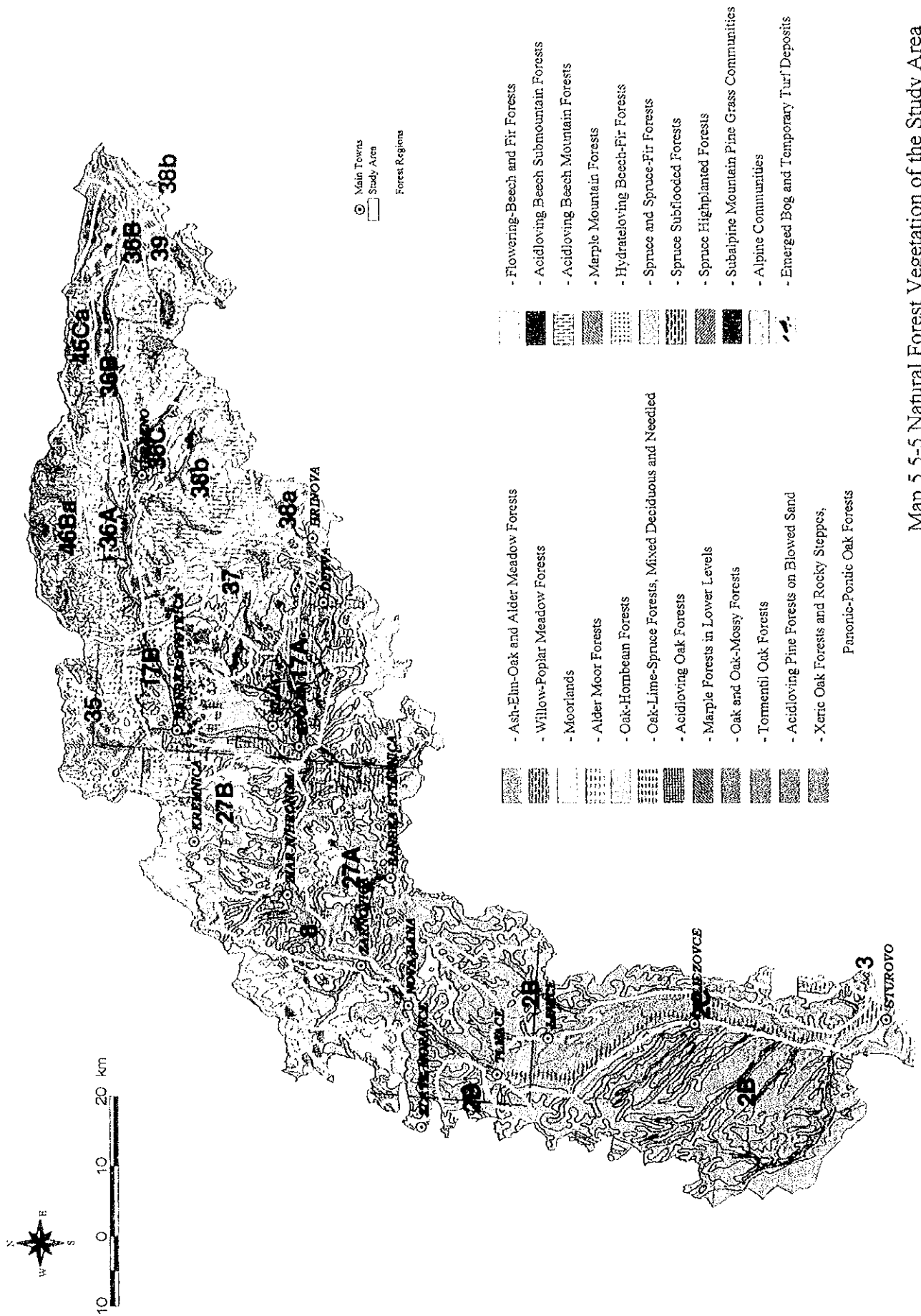


○ Main Towns
 □ Study Area
 Forest Regions

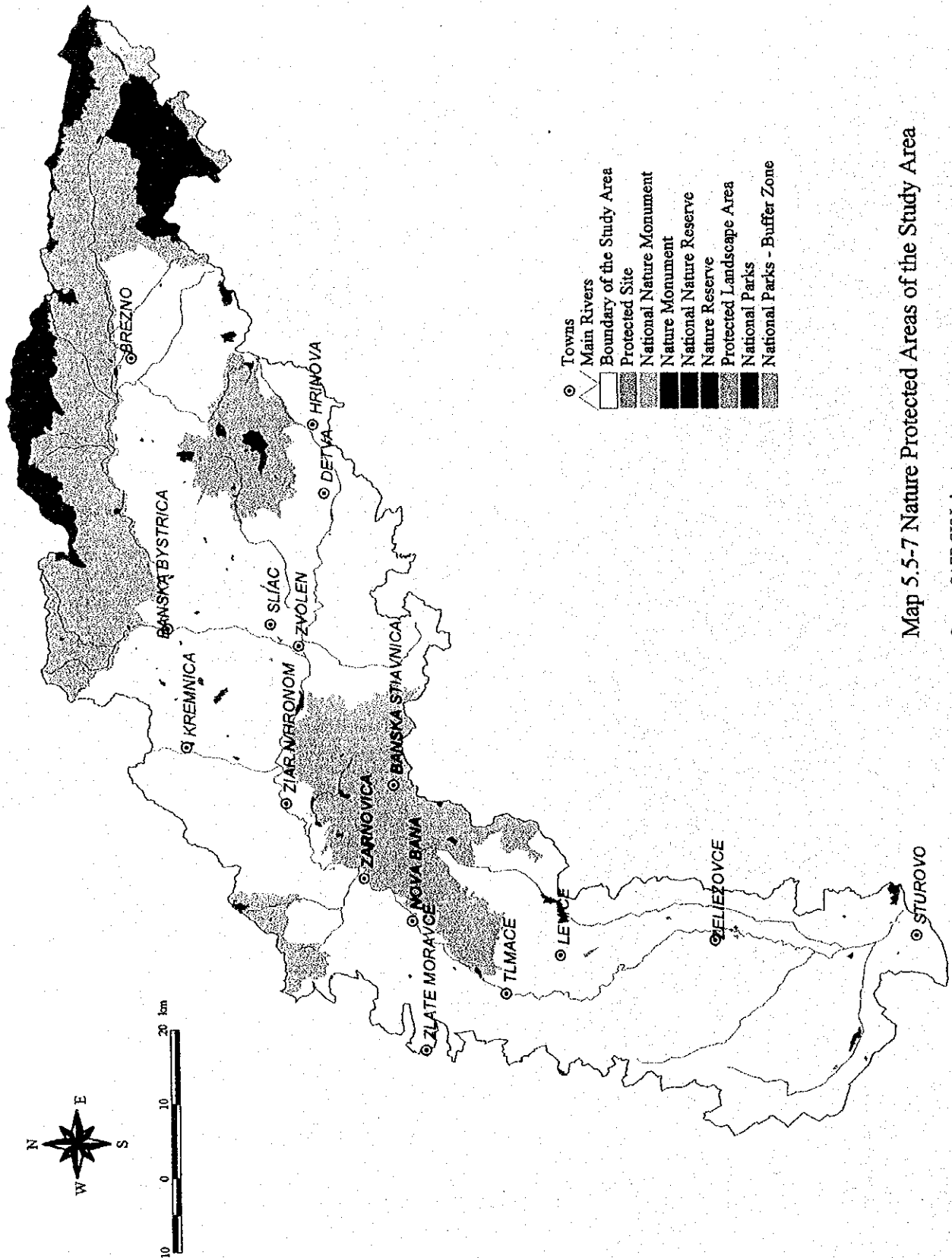
- Flowering-Beech and Fir Forests
- Acidloving Beech Submountain Forests
- Acidloving Beech Mountain Forests
- Marple Mountain Forests
- Hydrateloiving Beech-Fir Forests
- Spruce and Spruce-Fir Forests
- Spruce Subflooded Forests
- Spruce Highplanted Forests
- Subalpine Mountain Pine Grass Communities
- Alpine Communities
- Emerged Bog and Temporary Turf Deposits

- Asst-Elm-Oak and Alder Meadow Forests
- Willow-Poplar Meadow Forests
- Moorlands
- Alder Moor Forests
- Oak-Hornbeam Forests
- Oak-Lime-Spruce Forests, Mixed Deciduous and Needled
- Acidloving Oak Forests
- Marple Forests in Lower Levels
- Oak and Oak-Mossy Forests
- Tormentil Oak Forests
- Acidloving Pine Forests on Blowed Sand
- Xeric Oak Forests and Rocky Steppes, Panonic-Pontic Oak Forests

Map 5.5-5 Natural Forest Vegetation of the Study Area



Map 5.5-5 Natural Forest Vegetation of the Study Area



- ⊙ Towns
- Main Rivers
- ▭ Boundary of the Study Area
- ▨ Protected Site
- ▧ National Nature Monument
- ▩ Nature Monument
- National Nature Reserve
- Nature Reserve
- ▬ Protected Landscape Area
- ▮ National Parks
- ▯ National Parks - Buffer Zone

Map 5.5-7 Nature Protected Areas of the Study Area

Source: SAZP GIS Laboratory

5.6 HERITAGE AND OTHER TOURISM RESOURCES

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 Banska Stiavnica and the national parks of Nizke Tatry, Muranska Planina and Vel'ka 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.

The REMP cannot present a detailed analysis of the heritage resources and tourism industry, (especially those matters relating to traditional folk culture) and their recommended development in the area. These require a major study of their own and are outside the scope of this project and report¹. The section here briefly discusses the principal heritage and tourist attractions of the Hron basin, identifying the pressures they are currently experiencing, their present status and recommendations as to how they should be protected and developed in future.

5.6.1 ACTIVITIES AFFECTING HERITAGE AND TOURISM RESOURCES

(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.

¹ The REDIS Project has prepared a Tourism Development Strategy for the Stredne Pohronie Region (Ref. 24-18); this region occupies the central part of the Study Area and includes the important tourist/heritage assets of Banska Stiavnica and Kremnica. The strategy report describes some of the resources and the opportunities and constraints for their development. The contents of the report are not repeated here, but should be referred to as a useful guide for the development of this sector and for the information it contains on the attractions and facilities of the region.

The major pressures on the national parks and protected landscape areas are discussed in Chapter 5.5.1. These include those arising from activities not directly connected to tourism (air and water pollution, some forestry and agricultural practices, hunting and river engineering) as well as those arising from tourist activities themselves. In general, the pressures arising from tourism are not considered to cause major problems at present. However, as tourism expands in future, the potential for significant problems to arise will increase, particularly if such expansion is not adequately managed.

The principal tourism activities (apart from visiting cultural sites such as old buildings, museums etc in the national parks and protected landscape areas include the following:

- walking along the networks of designated paths;
- rock climbing;
- caving;
- fishing and hunting;
- downhill and cross country skiing;
- horse riding;
- enjoyment of nature (eg bird watching, plant studies, photography);
- collection of fruits, berries and mushrooms;
- observation of animals rare in Europe (eg bear, wolf, birds of prey);
- camping;
- cycling;
- canoeing;
- agrotourism.

Of these activities, walking and skiing have the greatest potential for causing damage. With excessive numbers of walkers on mountain paths, soil erosion quickly becomes a major problem at high altitude. Soils along the summit ridges and high plateaus of the mountainous areas are thin and easily eroded, and once they and the slow-growing vegetation are damaged, erosion from walkers and rainwater can quickly devastate large areas. Unless cycling (mountain biking) and motorcycling are carefully controlled, they can erode mountainsides more quickly than walkers. Large groups of the latter ride to the summit of Ostredok (1592m), the highest point of the Vel'ka Fatra PLA.

Skiing activities reportedly damage the upper areas of the Nizke Tatry national park through the usage of snowmaking machinery. Mountain vegetation is adversely affected by the artificially

prolonged duration of snow fields, by compaction of the snow and by erosion caused by building pipelines to carry water to the snow making machinery. Poorly designed and constructed roads at high altitude also cause erosion, as can the construction of ski lifts and ancillary buildings. The latter also usually cause landscape degradation, as does any type of soil erosion.

(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 - Harmanécka near Dolny 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 Muranska Planina National Park and Vel'ka Fatra PLA and the Nizke Tatry National Park around Brezno.

Many activities can damage caves and their important geological and biological features. These include, for example, mining and quarrying, some agricultural and forestry activities, water pollution, land drainage, groundwater abstraction, visitor pressure, caving and cave exploration. Damage may include complete destruction, as is possible with mining and quarrying. More likely negative changes are those to the physical and biological environments by activities that, for example, raise or lower water tables and/or water flows through caves, change the chemical properties of water flowing through caves or affect the water's physical properties eg increased sediment loads. All such changes will adversely affect sensitive and fragile cave environments leading to changes in such processes as the rates of chemical solution and deposition (eg crystal, stalactite and stalagmite formation), sediment deposition rates and the biological activities in the aquatic and other cave ecosystems.

Cave environments are generally considered to be the most stable and sensitive to change of all environments. This is because the biological, physical and chemical conditions change little over the seasons and years. Thus all processes take place within a very narrow range of conditions and any particular cave environment has developed in equilibrium with those conditions. Thus changes in environmental conditions resulting from any of the causes described above will result in negative changes to any or all of a cave's biological, chemical or physical processes.

(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 main activities that affect the fish are the discharge of untreated and partially treated domestic, industrial and agricultural waste waters and various river engineering works.

The effects of these are discussed in Chapter 5.5.1 and 5.5.2. Water pollution is now believed not to have significant negative effects on fish stocks, although in the recent past pollution levels were high enough to cause the absence of fish from parts of the river. It is currently believed that the presence of barriers to fish movements eg the Vel'ke Kozmolvce dam adversely affect fish populations by preventing seasonal spawning migrations of some fish species. However, any effects of pollution or fish barriers are difficult to estimate as the Slovak Fishing Union releases large numbers of young of many species into the Hron each year. The presence of fish barriers does interfere however with the life cycle of many fish in the rivers, an effect compensated for by the release young fish. Without such releases, it is highly likely that fish catches would be very low in the Hron river.

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 waters are factors which, amongst others, prevent its full development. The abstraction of water from the reservoir at the Vel'ke Kozmolvce dam, for industrial and irrigation purposes, also results in low river flow immediately below the dam. This also makes difficulties for canoeing, particularly at times of low river flow.

(4) Cultural Heritage

The Hron Basin's cultural heritage is also 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). The listed monuments component of this tourism resource and statistics on their condition are described in section 5.6.2, but the activities and other factors that have been identified as affecting these monuments are mentioned briefly below. They are mostly associated with economic change and institutional problems rather than pollution or other pressures directly related to industrial and municipal activities.

Visitor pressure does not yet appear to be a significant threat to cultural heritage, though this can be expected in the future.

The following are considered to be some of the pressures which do exist:

PRESSURES FROM ECONOMIC CHANGE

- 1) Damage to monuments, including buildings of architectural value and archaeological sites, associated with economic reform and rapid redevelopment, with inadequate studies prior to major developments eg roads.
- 2) Changes in rural way of life - traditional buildings not always very compatible with expectations of modern life-styles, leading to abandonment of homes with valuable 'folk architecture' or desire to modernise for those who do find alternative employment in rural areas. The owners of some houses that have been designated as 'Folk Architecture' now live elsewhere; they may use the buildings only at week-ends, and/or as holiday cottages, such that they are not regularly maintained and become dilapidated.
- 3) Frequent changes of ownership, including purchase by speculators, and parties who are not interested in the heritage value of monuments; also the return of property to original owners who may not have adequate resources for repair and maintenance.
- 4) Decline in industry/mining (technical monuments).
- 5) Air pollution damaging stone buildings, though perhaps less than in the past

PRESSURES RELATED TO INSTITUTIONAL ISSUES, LEGISLATION AND COMPLIANCE

- 6) 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.
- 7) Weaknesses and gaps in legislation on the Protection of Monuments (No. 27/87 of the Legal Codes) - eg repairs cannot be made compulsory, especially when the State cannot fund restoration; no requirement for work on listed monuments to be undertaken by registered/licensed/approved builders and craftsmen; conflicts with technical standards (eg building safety requirements).
- 8) Weaknesses in the institutional systems related to the management of monuments, including complicated procedures such that: (a) owners undertake work without permission (b) inspections are not made when required during the course of building works.
- 9) Non-compliance with conditions for building work, either deliberate on part of owners and/or through ignorance on part of builders - sometimes attributable to higher costs of repair in the specified way.

RESOURCE AND SKILL SHORTAGES

- 10) Lack of financial resources for Institute of Monuments and other responsible institutions (eg *Kraj* and *Okres*) to carry out their duties for the protection and management of cultural heritage.
- 11) In particular the Institute of Monument's resources for monitoring restoration and building activities are inadequate and inspection and monitoring can be dangerous.

- 12) Inadequate resources for maintenance and restoration.
- 13) Shortage of skilled craftsmen in traditional carpentry and woodcarving.

5.6.2 STATE OF HERITAGE AND TOURISM RESOURCES

(1) National Parks and Protected Landscape Areas

Generally, these are in good condition with a rich fauna and flora that form the basis for much of the tourism industry in the Hron basin (Chapter 5.5.1 and 5.5.2). Trees in all the forests are affected to a greater or lesser extent by air pollution, but except for some small heavily damaged areas it is not apparent except to experienced observers. Air quality and forest condition are believed to be improving at the present time and there are no reasons for thinking that tourism will be adversely affected by air pollution.

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, as observed in Chapter 5.6.1. 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

So far as is known, the caves of the Hron basin are not badly affected by tourism or any other of the potentially damaging causes discussed in Chapter 5.6.1. There is the possibility of such damages however, and good management and land use planning are essential to prevent them. Reportedly, caves in the Ponicka Basin near Banska Bystrica have been damaged by agricultural activities. There is however little monitoring of the condition of caves, so in general damages will go unreported.

Some of the Hron caves are known to be important roosting sites for bats. In addition, an endemic amphipod (*Niphargus dudichi*) occurs in caves of the middle Hron valley. The fauna of the Hron caves is not however generally well studied

(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 Banska Bystrica were killed by the release of ammonia from an industrial site. The abstraction of water from the reservoir at the Vel'ke Kozmolvce 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 Telgart, 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

1) Cultural Heritage Resource – Introduction, Classification System and Data Sources

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 particularly rich. In particular there are:-

- Three Historical Monument Reserves (HTR) - Banska Bystrica, Banska Stiavnica, Kremnica

- One Technical Monument Reserve (TMR) - Stiavnické Bane
- One Folk Architecture Reserve (FAR) - Spania Dolina
- Several Historical Monument, Technical Monument and Folk Architecture Zones - these include Hel'pa, Brezno, Zvolen, Kremnické Bane and Nova Bana

Of exceptional importance is the historical town of Banská Stiavnica (Refs. 24 – 5 and 24 –6) and the 'technical monuments' of its surroundings, especially its 23 water reservoirs (*tajchy*) (Ref. 24 - 4). These were designated a Cultural World Heritage Site by UNESCO in 1993.

Starting at the lowest level of importance/protection and with individual items or 'objects', cultural heritage 'monuments' in Slovakia are classified according to:-

- Immovable Cultural Monuments (CM)
- Movable Cultural Monuments (CM)
- National Cultural Monuments (NCM) - Immovable
- National Cultural Monuments (NCM) – Movable
- Folk Architecture Zone (FAZ)
- Technical Monument Zone (TMZ)
- Historical Monument Zone (HMZ)
- Folk Architecture Reserves (FAR)
- Technical Monument Reserve (TMR)
- Historical Monument Reserves (HMR) – typically a Historic Town

The National Cultural Monuments are individual monuments of the greatest significance and are accorded the strictest protection; approvals in relation to these monuments must be given by the *Kraj* office. Approvals in relation to Cultural Monuments are given by the *Okres* office. Where there is a significant grouping of individual monuments, specified areas can be designated as Reserves or Zones; the protection accorded to Reserves is stronger than that accorded to Zones.

This and succeeding sections describe and map some key features of the cultural environment of the Basin, drawing in particular on the comprehensive digital database of monuments kept by the Institute of Monuments in Bratislava. These data are supplemented by other information, which was obtained mainly from the Institute of Monuments' offices in Banská Bystrica and Banská Stiavnica.

There are other sites and items of cultural heritage and tourist interest, which need protecting and developing, but which are not clearly identified by the Monuments database - these include,

for example, some museums and galleries, the railway at Cierny Balog, cycle-ways, caves and spas. Information on caves has already been covered in section 5.6.2 (2) while some information on spas will be included in the Final Report. A range of these other Sites of Interest, natural and man-made and including some of the spas and more interesting and accessible 'monuments', have been identified and described in a series of tourist maps and booklets published by Vojensky Kartograficky Ustav (VKU), Ref. 24 - 1. 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 this Main Report shows the locations of the 73 sites of tourism interest that fall within the Study Area, while Annex J.2 presents a further breakdown by type and *Okres*.

2) Cultural Heritage Resources – Monument Reserves and Zones in the Study Area

Table 5.6 - 1 lists designated and proposed 'Cultural Heritage' Reserves and Zones in the Basin, as designated by the Institute of Monuments, and compares their number with the total numbers for Slovakia. Map 5.6 - 3 shows the distribution of these in the Basin according to the *obec/mesto* in which they fall - the whole of the Municipality being highlighted rather than the specific location of the designated settlement or rural area.

The table and map show that 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. One of the other two World Heritage Sites, the Volkinec Folk Architecture Reserve, is only just outside the Basin, between Banska Bystrica and Ruzomberok, and therefore accessible to tourists visiting the Basin.

Table 5.6 - 1 Designated and Proposed Cultural Heritage (Monument) Reserves and Zones, Nationally and in the Study Area.

CATEGORY	Banska Bystrica Kraj	Date of Designation No. of Cultural Monuments (where known)	Nitra Kraj	No. in Basin	No. in Slovakia
HISTORICAL MONUMENT RESERVE (HMR)	Banska Bystrica	18.v.1955 192		4	18
	Banska Stiavnica	11.vi.1950 191			
	Kremnica	11.vi.1950 115			
TECHNICAL MONUMENT RESERVE	Stiavnicke Bane	15.viii.1995 20			
FOLK ARCHITECTURE RESERVE (FAR)	Spania Dolina	10.i.1979 82		1	10
FOLK ARCHITECTURE (FAZ), TECHNICAL MONUMENT (TMZ) & HISTORICAL MONUMENT ZONES (HMZ)	Already Designated R: Rural (5) U: Urban (4)			9	86
	Brezno U Dobra Niva U Hel'pa R Hodrusa Hamre R Kremnica R (Mining Works) Kremnicke Bane R Nova Bana U Zvolen U	20.xi.1991 24.ii.1992 1.vi.1992 19.ii.1999 19.v.1999 21.iii.1997 3.v.1991 26.iv.1991	Batovce R 21.x.97		
FOLK ARCHITECTURE (FAZ), TECHNICAL MONUMENT (TMZ) & HISTORICAL MONUMENT ZONES (HMZ)	Proposed P: In Process of Approval S: Selected for Designation			P: 7 S: 13	P: 42 S: 87
	Babina R,P Brusno R,S Detva R,P Dolna Lehota R,S *Drabsko R,S Dubove R,S Hronec R,S Krahule R,P *Lom nad Rimavicou R,S Lubiatova R,S Muran R,S Ostra Luka R,P Pohorela R,S Stare Hory R,P Stare Hory (Rybo) R,S Tajov R,P Zvolenska Slatina R,P		Jablonovce R,S Stary Tekov R,S Uhliska R,S		

Source: Ref. 1-7 and 24 - 17, Slovak Institute of Monuments, Bratislava (1998) and Banska Bystrica Regional Centre (1999).

*: Falling in a cadaster just outside the Basin and agreed Study Area, but within Brezno *Okres*.

N.B. There is an ongoing programme of selection and approval of Monument Reserves and Zones; this table reflects the information readily available to the Study Team as of July 1999. Regular checks on status of proposals are required to keep this information up-to-date.

3) Cultural Heritage Resources – Individual Monuments in the Study Area

The digital data, from the database held by the Institute of Monuments in Bratislava, contains information on those immovable monuments occurring within the *Okres* of the Basin. The locations of the monuments is not given in terms of co-ordinates, but the data is recorded according to *Okres* and a land numbering system related to *Cadaster/Obec/Mesto*, so that information can be plotted according to these geographical units. The number of monuments within each of these units can also be shown (ie the frequency, which indicates the cultural significance of different areas).

Map 5.6 - 4 shows the distribution of designated cultural monuments in the Basin, irrespective of type. As for the Reserves and Zones, it is the central (around Banská Stianica and Zvolen) to upper parts (around Kremnica and Banská Bystrica, and also Brezno and Hrinova) of the Basin that are especially well endowed with designated monuments. Nevertheless the presence of small numbers of monuments in the lower part of the Basin - especially Levice and Zliezovce - is demonstrated.

Map 5.6 - 5 also shows the distribution of monuments, by *Okres*, but gives further details according to the 7 types of monument recognised by the database of the Institute of Monuments:

- Architectural Monuments
- Archaeological Monuments
- Historical Monuments
- Folk Architecture Monuments
- Technical Monuments
- Historical Gardens and Parks
- Art Monuments (eg Sculptures)

An individual monument can be recorded on the database under more than one category. Therefore care has to be taken in interpreting these data ie adding the total numbers of monuments recorded in each category for one *Okres* would lead to double counting, but gives an additional measure of the overall heritage value of a monument or an *Okres*. The figures indicate that the Monuments of the Basin are particularly important in terms of architecture and for their historical gardens and parks, and that these aspects are the most prominent both in Banská Bystrica and in Nitra *Kraj*. Banská Bystrica *Okres* has 30% of the total monument records, Banská Stianica 19% and Zvolen 17%.

Information on the condition / construction state of the monuments is given in the following section.

4) Record of the State of Cultural Heritage

This section reviews the 'condition' of 'Cultural Heritage' in the Basin, firstly as indicated by the 'Construction State' of monuments, secondly as indicated by inclusion on the list of 'Endangered Monuments' held by the Institute of Monuments – the latter being a recognition that urgent action is required to prevent further deterioration or loss of the monument.

The 'Construction State' is recorded in the database of the Institute of Monuments according to the following 5 categories:

- Good
- Satisfactory
- Poor
- Ruin
- Under Reconstruction.

It is recognised by the Study Team that this indicator does not clearly help in identifying and explaining the threats to the monuments (see later paragraph for consideration of this), since some buildings eg castles may have been in a **ruined state** for many years, such that major re-construction would be required to return them to their original state. The intrinsic appeal of such monuments is that they are a ruin and their re-construction would be inappropriate.

The condition of monuments in the Basin, as defined by their **Construction State**, is presented in Map 5.6 - 6. Though 93.7% of the recorded monuments are in *Banska Bystrica Kraj* and only 6.3% in *Nitra Kraj* in the lower basin, the figures suggest that, in percentage terms, those in the former area are generally in better condition than those in the latter ie 31.3% are satisfactory and 19.7% poor in *Banska Bystrica Kraj*, the corresponding figures in *Nitra Kraj* are 20.2% and 41%. Overall only 21% are considered to be in poor condition. That only 6.4% are classified as ruins may be acceptable if these monuments are 'ruins' of long standing and their ruined state is part of their attraction.

Within *Banska Bystrica Kraj* the *Okres* with the highest levels of monuments in 'Poor Condition' are *Ziar nad Hronom* and *Zvolen*, with 43.7% and 36.3% respectively. *Zarnovica* and *Banska Bystrica Okres* have the most monuments in 'Good' condition, with 52.5% and 42.0% respectively.

Closer examination of these figures, relating condition to type of monument, (Map 5.6 - 6), indicates that it is those monuments classified as 'Historical' which are generally in better condition, with only 6% classified as poor. Figures for other types of monument suggest that archaeological monuments (33%), and technical monuments (33%) have the highest percentages classified as being in poor condition, though it is believed that this may indicate their state in relation to that when first constructed and/or the ease with which they can be accessed and appreciated, and not that they are under immediate threat of 'destruction'. Again it should be noted that there is double-counting of monuments, because many monuments are recorded under more than one category eg both archaeological and historical.

Comparison of these data with national figures, including figures for numbers of monuments under reconstruction, would give an indication of whether the state of monuments in the Study Area is generally higher than in Slovakia as a whole, but national data were not obtained during the course of the study.

The condition of monuments in the Study Area, as defined by their inclusion on the 'Endangered Monuments' listings of the Institute of Monuments is described here. For Banska Bystrica, Brezno, Zvolen and Detva *okres*, the Banska Bystrica office of the Institute of Monuments has provided a list of the Immovable Monuments at most risk (of destruction/damage/deterioration), and of the most threatened Movable Cultural Monuments. Equivalent data for the other *Okres* in the rest of the Study Area has been obtained from the Institute of Monuments in Bratislava.

There are 105 Immovable Objects recorded as 'Endangered' in the Study Area and 108 Movable 'Endangered' Objects (Table 5.6-2; some of the monuments have more than one feature of interest and each is recorded as a separate object, therefore there is some 'double-counting' of monuments; the figures for movable objects may be incomplete for Banska Bystrica, Brezno, Zvolen and Detva). With regard to endangered immovable objects, most 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). 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), while 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.

The relatively low number of endangered immovable monuments (6, out of the total 105 for the Study Area) in the three southern *Okres* of the Basin, corresponds well with the small percentage (6.3%) of immovable monument records that occur in this part of Nitra *Kraj*. Therefore there does not appear to be any significant difference between the two *Kraj* in terms of the attention that still needs to be paid to the restoration of endangered monuments. The distribution of endangered immovable monuments by Municipality is shown on Map 5.6 – 4.

Table 5.6 - 2 Number of Endangered Monuments within the Study Area, by *Kraj* and *Okres*, in relation to the distribution of Monuments by *Kraj* and *Okres*

	Name	% of Total Immovable Monument Records (1998)	No. of Endangered Immovable Monuments (1999)	*No. of Endangered Movable* Monuments (1999)	Total* No. of Endangered Monuments (1999)
<i>Kraj</i> (Region)	Banská Bystrica	93.7	99	*108	207
<i>Okres</i> (District)	Banská Bystrica	30.7	13	*2	*15
	Banská Štiavnica	19.4	38	83	121
	Brezno	9.8	1	*0	*1
	Detva	2.9	0	*0	0
	Revúca	0.6	1	0	1
	Zarnovica	8.6	25	19	44
	Ziar nad Hronom	4.5	20	4	24
	Zvolen	17.2	1	*0	*1
<i>Kraj</i> (Region)	Nitra	6.3	6	0	6
<i>Okres</i> (District)	Levice	5.1	3	0	3
	Nové Zámky	1.0	3	0	3
	Zlaté Moravce	0.1	0	0	0
Study Area		100%	105	108*	*213

Source: Institute of Monuments, Banská Bystrica and Bratislava

NB: Some of the monuments have more than one feature of interest and each is recorded as a separate object, therefore there is some 'double-counting' of individual monuments.

*The figures for movable objects may be incomplete for Banská Bystrica, Brezno, Zvolen and Detva

The full set of reasons why these monuments are classified as endangered is not known to the Study Team. The best, qualitative understanding of the various causes of damage and decay, and threats to the survival and sustainable management of monuments and other elements of the Study Area's cultural heritage, lies in the first hand knowledge of concerned officials of the *Kraj* and *Okres*, Institute of Monuments, and of academics and NGOs, and has been indicated in section 5.6.1 (4) above. However it is believed that most of those monuments that have been listed in the 'endangered' condition, have been listed because of medium to long term neglect and exposure to the elements, and not because they are subject to direct threats from owners and development.