INVENTARISATION OF THE NATURAL HERITAGE

INVENTARIZIRANJE NARAVNE DEDIŠČINE

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Rojšek, Daniel: Inventarizacija naravne dediščine

Termin inventariziranje pomeni evidentiranje in vrednotenje naravnih pojavov, ki jih uvrščamo med naravno dediščino. Veliko kraških pojavov lahko inventariziramo kot naravno dediščino. Nekaj najpomembnejših naravnih znamenitosti matičnega Krasa in Posočja je bilo predstavljenih v Postojni in Great Malvernu. Avtor predstavlja izpopolnjeno metodologijo inventariziranja s kriteriji vrednotenja naravnih pojavov, inventarnim listom in nekaj primeri z zavarovanega ozemlja Škocjanskega jamskega spleta, enote vpisane v Seznam svetovne dediščine in s Posočja.

Ključne besede: methodologija inventariziranja naravne dediščine, naravne znamenitosti, kraški pojavi, inventarni list oziroma računalniško obdelana zbirka podatkov, Slovenija, Posočje, matični Kras, Škocjanski jamski splet.

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Rojšek, Daniel: Inventarisation of the Natural Heritage

Verb inventory is understood as a process of recognition and evaluation of natural heritage. Many of karst phenomena shoud be inventoried as parts of natural heritage. Some of the most important natural features of matični Kras and of Posočje were presented in Postojna and in Great Malvern. Methodology of inventarisation has been upgraded and it will be presented by criteria of evaluation, an inventory foil and by some examples from the protected area of the Škocjanski jamski splet - the World Heritage Site and Posočje.

Key words: methodology of natural heritage inventarisation, natural features, karst phenomena, inventory record and foil, Slovenia, Posočje, the Soča river basin, matični Kras, Škocjan Cave System

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INTRODUCTION

Methodology of natural heritage inventarisation is perceived as a recognition and evaluation of natural phenomena uneconomical characteristics. The methodology was being improved during a long study of the natural heritage and of the Škocjanski jamski splet characteristics (Rojšek 1983, 1987, 1989-93). Inventories shoud be introduced to public (Peterlin/ Ed. 1976; Skoberne & Peterlin/Eds. 1980, 1990; Rojšek 1992-1) and must be maintained by field controls and by office processing.

There is no especial methodology and inventory foils for the karst, but the methodology is relevant for all kinds of natural phenomena.

Karst phenomena in proper sense can be found in the 1st group, but in wider sense all groups of natural heritage units (Fig. 2) may be found in a karst region. A karst can be also treated as a natural heritage system of abiotic and biotic features.

METHODOLOGY OF NATURAL HERITAGE INVENTARISATION

Natural heritage is composed of natural phenomena and noncommercial worths. Elements of natural heritage are coupled into physical and cultural-anthropological group. In the first group natural processes and phenomena are found, cultural worths or positive relationship to nature respectively recognition of exigency Men and Nature pertain to the

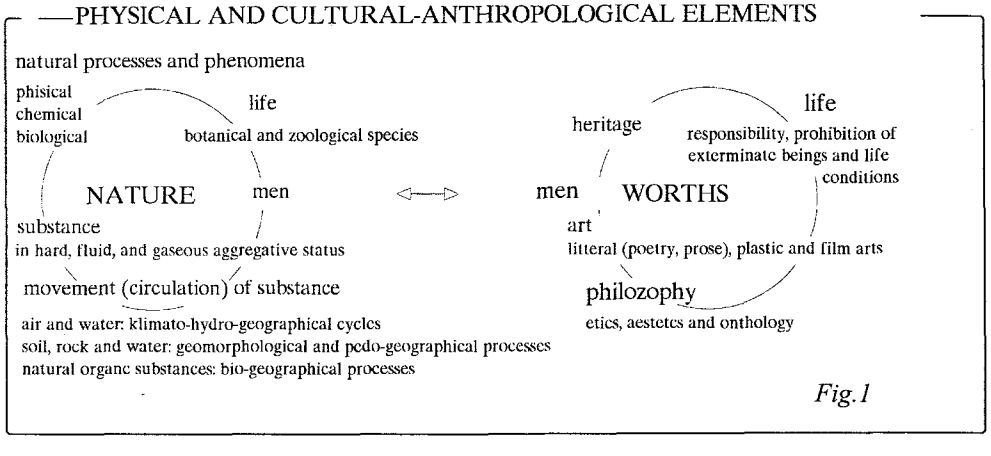

Fig.1

second one (Fig. 1). Parts of natural heritage are called units of natural heritage. Understanding of natural heritage partitioning is dependent to comprehension of complexity principle (--> 1.1). Units of natural heritage are encircled in 5 groups (Fig. 2).

Even one element of each group is enough to inventory a natural phenomenon as a natural heritage unit, more elements fetch higher rank to the unit.

Criteria of evaluation are divided as elements of natural heritage in two gropus, physical and cultural-anthropological. Physical respectively earth science and biological criteria are resumed from methods of geology, geography, biology (botany, zoology and ecology), and mathematics (statistics), but cultural-anthropological ones from ethnology, cultural-anthropology (arheology, history, cultural and physical anthropology with quartarology and sociology of culture), philosophy (onthology - axiology, aesthetic) and artistry (prose and poetry, painting and sculpture, photography, film and video, history of art and literature).

EVALUATION AND INVENTARISATION OF NATURAL HERITAGE

THE FIRST GROUP OF CRITERIA

Basis for evaluation of natural phenomena are modified methods of earth science and ecological research by aspects of natural heritage inventarization. In the 3rd figure the criteria are displayed.

CRITERIA OF COMPLEXITY

Principle of complexity represents basical characteristic of geographical research. Nature is formed of more or less intervolven phenomena, which could be parsed or gathered in groups. Principle of complexity is used for determination of cohesions and/or intervoluations

Fig.2

I. group of natural heritage units - some elements of relief or geological and geomorphological heritage

II. group of natural heritage units - hydrological and nival-glacial or hydrogeographical heritage

III. group of natural heritage units - some elements of soil and vegetation or pedological and botanical, botanical, dendrological and forcstal heritage

IV. group of natural heritage units - some elements of animality or zoological heritage

V. group of natural heritage units - natural heritage with anthropogencal elements or formed heritage
V. parks, gardens V. collonades of trees

among natural processes and phenomena. Outcomes of evaluation are ranked units of natural heritage. A rank of complexity onsets with basical unit, upwards the rank is limited by purport of further evaluation. Units of natural heritage may be simple or complex. Reflexive effect must be regarded by complexes, which is fundamental for its subsistence. Worth of natural heritage unit of higher rank is widened by number and grade of lower rank units and vice versa.

Units of natural heritage complexity are distinguished by three groups.

Basical units can not be divided, namely sense of a phenomenon is lost. For example a stalagmite, which represents a simple unit of geomorphological heritage can be divided into a foot, a middle part and a top, but this parts are senseless without totality.

Complexes of natural heritage are those with phenomena of the same group (collapsed doline with karren, pothole and cave = geomorphological heritage) or that of higher rank with various kinds of natural heritage (collapsed doline with a fossil site, a growing site of rare species, springs, a waterfall and a ponor = geomorphological, geological, botanical and hydrogeographical heritage) lying in a small encircled area. The area may be treated as a geomorphological heritage.

Systems of natural heritage are the highest rank among the complexes. Units of the systems may be found even in different macro-regions. For example hydrological phenomena in drainage areas of Rakuljščica, Sušica and Mrzlek or Škrnik brooks, Velika voda - Reka, Soča and Timav (Il Timavo) springs seeming unvolven phenomena, but hydrogeographical analyses indicate system of natural heritage linked by running water, lying in different Slovene mesoregions.

Relative small complexes of natural heritage, for example: Ukmarjev dol with two potholes, and wide composite systems, for example: Velika voda-Reka - Vipava - Soča - Doberdobško jezero (Lago del Doberdo) - Timav (Il Timavo) springs are distinguished in the Kras and Posočje regions.

Cohesion and/or intervoluation among natural phenomena is more important then extent of natural heritage units. The highest grade of cohesion is represented by direct genetical relationship, for example Martelova dvorana of Škocjanski jamski splet and Škocjanski kanal of Kačja jama. The lowest grade is represented by distant indirect junction, for example changing of water level in Rakuljščica brook, in Lindnerjeva dvorana of Lobodnica cave and in Timav springs.

Extent of natural heritage units should not be overlooked. Upper limits of units have been set up accordingly to extent of Republic Slovenija and its physico-geographical regions.

Situation or geographical position of natural phenomena is a particular problem. Direct genetical relationship (at least one the same and/or coactive process) is generally conditioned by geographical position. For instance: Vremska dolina - Škocjanski jamski splet - Kačja jama - Lobodnica - Timav - Dobrdobško jezero and Kras are of the similar origin. Units of natural heritage are ranked higher because of position in Kras, but the region is known just by the mentioned phenomena.

The position of natural heritage unit is not conditioned by the relationship in many cases. For example limetrees near the church in Škocjan are not junctioned by genesis of Škocjanski Kras, but the trees grow in the central settlement of the World Heritage Site and so they have been inventorised natural heritage.

ECOLOGICAL CRITERIA

The five criteria are resumed from (Skoberne & Peterlin/Eds. 1988; 1991, 22), the sixth one have been added in a study of natural heritage in the Škocjan World Heritage Site.

MATHEMATICAL CRITERIA

Numerical data of natural heritage may be surveyed by exact instruments or estimated. There are many difficulties by statistical processing of very rich natural heritage in Slovenija, the data are unverified or even unknown (speleological and other geomorphological phenomena) and/or of unknown origin. Many of natural heritage units have not been inventoried, yet.

Diskriminantal and cluster analysis (Ferigoj 1989; SPSS 1975) of elements of the physical and of the cultural-anthropological groups are mentioned among statistical methods.

CULTURAL-ANTHROPOLOGICAL CRITERIA

Interbraids of natural and cultural heritage, role of natural heritage in community life and human relationship to natural heritage are evaluated by criteria of this group by outcomes and/or methodes of archaeological, historical, cultural-anthropological, ethnological, cultural-sociological, history of art and philosophical (ontology, axiology, aesthetic) research.

Criteria are codified in two groups. The groups and the criteria are displayed in the Fig. 3.

- Natural heritage and residues of material culture is a name of the first group of cultural-anthropological criteria.
- A unit may be ranged by one criterion: Wittnessstand or interbraid of natural and cultural heritage. For instance archeological sites in natural monuments Tominčeva jama, Ozka špilja and Velika jama na Prevali.
- Natural heritage and social and spiritual or mind culture. The second group of the criteria enclosed relations among natural heritage and sphere of human nonmaterial activities. A unit may be ranged by five criteria.
- Symbolic sense of natural heritage is established when society identifies itself by the unit. For instance Triglav is Slovene symbol of more than millenium long combat for equality and freedom, which was realised by independent Republic of Slovenia in 1991.

• Picturesqueness by the criterion aesthetic proportions of natural heritage unit may be found. Picturesqualy unit strikes visitors and/or it is/may be favourite motive of artists.

• Exceptional features created by natural processes is a reason to range a natural phenomenon to natural heritage. Determining of fito-, zoo- and anthropo-morphical phenomena can be sapid. Žena (woman) in Svetinova dvorana of the Škocjan System is an example of anthropomorphical phenomenon.

FIGURE 3

LIST OF CRITERIA FOR NATURAL HERITAGE EVALUATION

EARTH SCIENCE CRITERIA

COMPLEXITY

a simple unit of natural heritage
a simple unit direct part of a natural heritage complex
a simple unit a typical natural pheneomenon

a simple complex ($F < 1\ km^2$) of a single natural heritage group
a simple complex of typical natural phencomena
a simple complex ($F < 10\ km^2$) of various natural heritage groups

a simple system ($F < 10\ km^2$) of natural heritage
a small composed ($F > 10 < 100\ km^2$) system of natural heritage
a middle composed ($F > 100 < 500\ km^2$) system of natural heritage
a big composed system ($F > 500\ km^2$) of natural heritage

a phisical-geographical meso-region ($F < 500\ km^2$), abundant by natural heritage
a phisical-geographical macro-region, ($F > 500\ km^2$), abundant by natural heritage
a natural heritage unit as a part of phisical-geographical region, abundant by natural heritage

ECOLOGICAL CRITERIA

high degree preserved ecosystem
ecosystem with large variety of habitats (stable ecosystem)
rare ecosystem with a biotop or a biocenosis rare in *Slovenija*, Europe or even in the Earth
ecosystems with botanical and zoological species - endangered - relics or endemits - with *locus classicus* - in disjunctional, azonal, ekstrazonal and/or marginal areas
areas of many diverse ecosystems
ecotop of typical vegetation of characteristic pedological profile

MATHEMATICAL CRITERIA

rarity of natural heritage
exceptional rare (up to 5 specimen in *Republika Slovenija*
very rare
rare
rare in a region

dimension/s in space
maximal units of natural heritage (absolute maximum of all three dimensions)
very big units of natural heritage (absolute maximum of two dimensions)
the ...st (highest, deepest ...) units of natural heritage (absolute maximum of one dimension)
relative big unit of natural heritage
miniature natural phenomenon

dimension/s in time
age of natural heritage unit
natural heritage unit of active processes

quantity, quality, ratio, distribution and condition of natural heritage elements and units
exceptional quantity
high quality,
ratio and distribution
exceptional condition

frequency of natural features emerging in the same place
permanent phenomena
periodic phenomena

CULTURALANTHROPOLOGICAL CRITERIA

NATURAL HERITAGE AND RESIDUES OF MATERIAL CULTURE

witnesstand or interbraid of natural and cultural heritage

NATURAL HERITAGE, SOCIAL AND MIND OR SPIRITUAL CULTURE

symbolic sense
picturesqueness
exceptional shapeness
natural heritage unit, important landscape element
local remarkable natural feature

• Natural heritage unit, important landscape element. Some units are important landscape elements. Importance may be establised like picturesqueness and symbolic sense in a process of establishing subjective relationship among vision and perceiving.

• Local remarkable natural feature. Somewhere natural heritage units were recognized famous local features. Even settlements were named by natural features. For example natural window called Luknja (hole) or Otlica (something hollow) lending its name to the village (Rojšek 1992, 6, 170).

NATURAL HERITAGE INVENTORY RECORD AND FOIL

Inventory foil is appropriated to all kinds of natural heritage units. The foil exists in two forms as a print and as a digital record.*1 It is composed of 135 fields. Records are organised in inventory as a printed register and as a data base. The most important data are that, which are gathered *in situ*. Quality of data (surveyed, estimated, resumed by sources and so on) must be clearly designated. Data fields of the record and the foil are classified in three groups. In the 1st one data for identification are found, in the 2nd one data for evaluation are used, and the 3rd one is documantary. Contents of the foil is presented in Fig. 4.

CONCLUSION

Natural heritage is composed of natural phenomena and noncommercial worths. Elements of natural heritage are coupled into physical and cultural-anthropological part (Fig. 1). Evaluation and inventarisation of natural heritage is a process linked to cultural rank of social development. Results of the process must be scientifically undoubtfull, and so respected and appreciated by authorities, individuals and society.

Natural heritage is divided into units, which are organised in five groups (Fig. 2).

In the first step of inventarisation natural phenomena are recognized. In the next one criteria of natural heritage evaluation are used and natural heritage units are formating. The criteria are divided into two groups of elements. In the first one earth science and biological criteria are resumed from methods of geology, geography, biology and mathematics. In the second one cultural-anthropological criteria are abstracted from methods of ethnology, cultural-anthropology, philosophy and art (Fig. 3).

In the last step inventory foil of natural heritage unit (Fig. 4) is processed up, but inventories shoud be introduced to public, and have to being maintained by field controls and by office processing.

The role of geography is very important during inventarisation of natural heritage (Rojšek 1991).

*1during processing softwares STeve and EVE by P. Jakopin (1989, 1993) were being used.

INVENTORY FOIL - 135 FIELDS

001 regional or local evidence number
002 central state evidence number

003 settlement 004 commune 005 local community
006 land cadastre district 007 land cadastre parcel number
008 ev. number in Slovene cave cadastre 009 ev. number in former Italian cave cadastre VG

010 NAME 011 synonym/s 012 toponym/s

013 natural heritage unit - a "point" (F < 79 m^2 map sign - point of 1 mm diameter)
014 natural heritage unit - an "area" (F > 80 m^2 map sign - square of 1 mm side)
015 Gauß/Krüger coordinates: Y 016 X 017 Z
018 Z max. = the highest point a.s.l. 019 Z min. = the lowest point a.s.l. 020 Z pop. = mean sea level
021 after (map of of big scale (1:5.000, 10.000 - TTN, 1:25.000 - TK 25/G), altimeter/depthmeter ...)
022 name of map TK 25/G 023 TTN 10 024 TTN 5
025 1st remark

026 SIGNATURE
027 DIMENSION/S: - lenght 028 - width 029 - height 030 - depth
031 - circumference 032 - area 033 - volume
034 2nd remark
035 accuracy (+/- %) 036 Instruments

037-047 GROUPS AND SPECIES OF NATURAL HERITAGE (--> figure 1)

048 LOCATION: on surface 049 in underground 050 beetwen surface and underground

051-95 EVALUATION (--> figure 2 - LIST OF CRITERIA FOR NATURAL HERITAGE EVALUATION)

096 FUNKCTION/S: - "monumental" or witnesstand 097 - reserve 098 - scinetific-researchal
099 - biotopic 100 - breeding-educational 101 - recreational

102 PLANE - JURISTIC STATUS: - republic obligatotry starting-point in planning
103 juristic status 104 juristic act 105 plane phase
106 conservaton status of *Republika Slovenija*
107 conservaton status of IUCN
108 conservaton status of European community
109 basic conservaton regime (number) 110 other conservaton regime/s (number/s)

111-114 BRIEF DESCRIPTION: 4 chapters
115 date/s of visit/s 116 date of last visit

117 STATUS: - of preservation 118 - of endangerness
109 photo-documentation - BW 120 - color slide/s 121 - color negatives 122 - film 123 - video
124 basic reference/s 125 other reference/s
126 basic source/s 127 other source/s
128 author/s of data 129 author/s of description 130 processed by
131 3rd remark 132 4th remark 133 5th remark
134 date/s of processing 135 date of the last change/s

Fig. 4

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INVENTARIZIRANJE NARAVNE DEDIŠČINE

Povzetek

Pojem naravna dediščina je sestavljen iz dveh polov. Prvega tvorijo naravni pojavi, v drugem pa najdemo vrednote. Tudi prvine naravne dediščine so zaokrožene v dveh skupinah, fizični in kulturno-antropološki (slika 1).

Ovrednotenje in inventariziranje naravne dediščine je proces, ki je povezan s kulturno stopnjo družbenega razvoja. Rezultati tega procesa morajo biti znanstveno neoporečni, kot take pa bi jih morali spoštovati posamezniki, oblast in družba.

Naravno dediščino sestavljajo enote, ki so združene v petih skupinah (slika 2).

Inventariziranje začnemo z evidentiranjem naravnih pojavov, nato jih ovrednotimo in izbrane uvrstimo med enote naravne dediščine. Merila za vrednotenje so razvrščena v dve skupini. V prvi najdemo naravoslovna merila, ki temelje na spoznanjih geologije, geografije, biologije in matematike (statistike). Drugo skupino tvorijo kulturno-antropološka merila. Ta so utemeljena na osnovi spoznanj etnologije, kulturne-antropologije, filozofije in umetnostne zgodovine (slika 3). Na koncu uredimo podatke v računalniški zapis oziroma zbirko podatkov in jih izpišemo na obrazcu, inventarnem listu (slika 4).

Vendar inventariziranje ni končano, kajti inventarje je potrebno vzdrževati s spremljanjem stanja v naravi, novimi odkritji, pisarniško obdelavo podatkov in besedil ter predstavljanjem naravne dediščine javnosti. Geografija igra pri multiinterdisciplinarnem inventariziranju naravne dediščine pomembno vlogo (D. Rojšek, 1991).