ALPBIONET2030

Integrative Alpine wildlife and habitat management for the next generation

Decision Protocol

WP T1, CSI Workshop, Trenta, 09. October 2017

1 Introduction

The general concept of the CSI indicators was summarized. Afterwards every project partner involved in the refinement of the indicators presented its proposition of its specific indicator – followed by a discussion of all participants in order to discuss and determine the final classification schemes. With few exceptions all indicators were finally decided. The indicators are described in the following sections.

1.1 Tasks

Task	Due time	Responsible
Final definition of CSI indicator methodology	Oct. 2017	SNP, ASTERS, all PR[1]
Deliver all missing geospatial data of PR (format: WGS84 Web Mercator – epsg3857)	Oct. 2017	all PR
EUSALP wide CSI indicator layers available	mid Nov. 2017	SNP
Regional indicator layers available	Jul. 2018	SNP, all PR

2 CSI Indicators

2.1 Land use

Land use will be classified according to the following classification scheme. It is a combination of published values[2], an expert workshop of another project in Grisons (Switzerland), the evaluation of the questionnaire distributed among project partners and the CSI indicators workshop in Trenta (9 October 2017).

Category	sub-category	Value
Native land use		10
	rock	7
	unconsolidated rock	6
	glacier	7
	bog	10
	fen	10
	wetland	10
	floodplain	10
Fallow land		7
Inactive land		6
Open land		6
Rangeland		8
Reclaimed lands		7
Unimproved & Woodland pastures		8
	wood pasture	8
	quality meadow	8
	extensive meadow	8
Woodland		6
	natural forest	9
	semi-natural forest	8
	altered / modified forest	5
	forest	6
	open forest	9
	brushland / scrubland	9

[1] PR: Project region
[2] Carr, M. H., et al. 1999 ; Carr, M. H. ; et al. 2002 ; Kias, U. 1990 ; ten Brink, B., et al. 2006

Category	sub-category	Value
	particular forest community	9
Water bodies		7
	pool / fish pond	8
	(small) watercourse	8
Riparian vegetation		8
Improved pastures		5
Tree plantation		4
Historical sites		4
	historical routes	6
Parks and zoos		2
Road associated green spaces		4
Extensive agriculture		7
	extensive grassland	8
	dry-grassland	10
	low-nutrient grassland («Magerwiesen»)	6
	flowery meadow	9
	daffodil-meadow	8
	further categories for agriculture (Slovenia)?	
Agriculture		3
	Cropland	4
	Intensive agriculture, artificial pastures	2
	Row and field crops	4
	further categories for agriculture (Slovenia)?	
tree crops		2
	traditional standard orchards	8
Cemeteries		2
Correctional		1
Extractive / strip mines		2
Golf course		2
Holding ponds		1
Military		2
Nurseries		2
Vineyards		4
Oil and Gas fields		1
Recreational		2
Speciality farms		2
Swimming beach		2
Undeveloped urban land		2
Urban land / transition		2
Irrigated / drained land		2
Main roads		1
	6m road	1
	10m road	1
	motorway	0
	highway	0
	highway exit	0
Transportation		1
	cable car	1
	ski lift	1
	transport cable car	1
	railway	0
	motorway service area	0
	airport	0
Comm. Service under construction		0
Commercial and services		1
Communication		0
Community Rec. Facilities		1
Industrial		0
Other Recreational		1
Pits & Quarries		1

Category	sub-category	Value
Residential		1
Stadiums		0
Urban		0
Utilities		0

2.2 Population

The population pressure index combines permanent inhabitants and tourism demand. For tourism demand overnight stays are taken as a proxy.

In addition to the population pressure index, population growth and growth of tourism demand will be combined in order to depict areas where increasing/decreasing population pressure is expected.

2.3 Fragmentation

Fragmentation will be analysed by the effective mesh size m_{eff} (Jäger, 2000)

$$m_{eff} = \frac{1}{A_g}\sum_{i=1}^{n} A_i^2$$

where A_g is the total area, A_i the subarea i and n the number of subareas. In order to omit the boundary problem, the cross-boundary connections (CBC) method proposed by Moser et al. (2007) will be applied (Fig. 1).

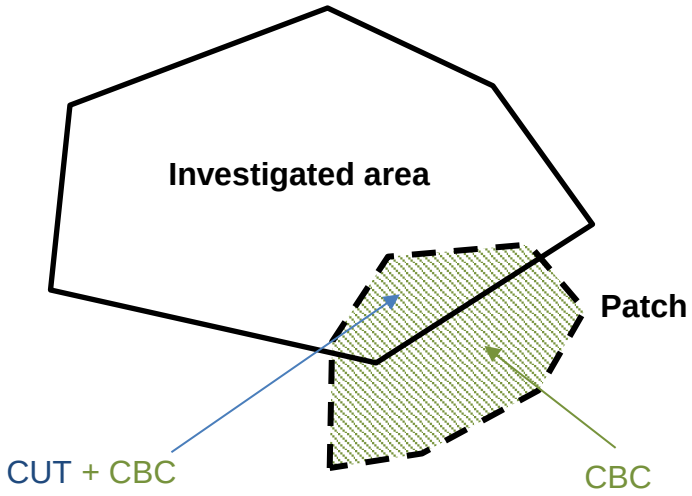

Fig. 1: Scheme CBC approach.

In order to establish a common classification scheme from the effective mesh size, the effective mesh density s_{eff} is derived. It will be calculated on a regular grid of 1000 km^2 as proposed by FOEN (2011).

Within the project only anthropogenic barriers are considered. For fragmentation the following data is used:

- Roads:
  - Highways
  - Roads of Class 1 – 3 (Bertiller et al., 2007)
  - Tunnel > 1 km (EEA, 2011)
  - Buffering of roads on either side in order to reflect the loss of habitat due to their surface (EEA, 2011)
- Railways
- Settlement areas

- Facilities (airports, railway areas)
- Dams
- Pressure lines (overhead)

The effective mesh density is classified according to the classification scheme in Tab. 1.

Number of meshes per 1000 km² (s_{eff})	Indicator Value (0-10)
<0.1	10
0.1-0.25	9
0.25-0.5	8
0.5-1	7
1-2	6
2-5	5
5-10	4
10-25	3
25-50	2
50-100	1
>100	0

Tab. 1: Effective mesh density classification scheme.

2.4 Infrastructure

The following datasets will be considered in the infrastructure indicator:

- power lines
- cable cars
- ski slopes
- avalanche barriers
- ski lifts
- embankments
- roads
- railways

The infrastructure itself is classified as zero. Depending on the infrastructure object type a distance dependent classification of the surrounding is applied. The influence radius will be derived from published values (→ literature review).

2.5 Altitude and topography

For the combined indicator on altitude and topography classification schemes in Tab. 2 are applied.

Altitude (m a.s.l.)	Indicator Value (0-10)
- 1500	10
1500-1675	9
1675-1850	8
1850-2025	7
2025-2200	6
2200-2375	5
2375-2550	4
2550-2725	3
2725-2900	2
> 2900	1

Slope (°)	Indicator Value (0-10)
≤ 30°	10
30-40°	7
40-45°	5
> 45°	3

Tab. 2: Classification scheme for altitude and topography.

2.6 Environmental Protection

Protected areas are classified according to the classification scheme in Tab. 3.

Protected Area Type	**Indicator Value (0-10)**
Strict conservation status, no economic use	10
Protected areas with strictly regulated economic use	9
Protected areas with legal restraints	6-7
Natura 2000	6
Protected area where the management serves the sustainable developmnet of natural ecosystems	5
No protection	0

Tab. 3: Classification scheme for environmental protection.

2.7 River morphology

It was agreed on not to include a river morphology indicator for the project regions. Highly altered river segments will be included in the fragmentation indicator.

3 References

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