

Population indicator POP (EUSALP)

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Summary Classification of human pressure on ecological connectivity. It is expressed as a combination of permanent inhabitants and tourism demand. It is one of the indicators belonging to the continuum suitability indices CSI (consisting of LAN, POP, FRA, TOP and ENV).

Legend

10	6	2
9	5	1
8	4	0
7	3	

1 Introduction

Humans are seen as the main drivers of change for the state of ecological systems by the Millenium Ecosystem Assessment (2005), and the threat to biodiversity increases as human population density increases (Luck, 2007). The population growth leads to land transformation, it may have an effect on the introduction and establishment of exotic species, and it reduces energy availability. All these factors may influence each other, leading to feedback loops including socioeconomic factors. In addition to permanent inhabitants, tourism demand plays a role in human pressure on ecosystems – especially in the Alps. Environmental impacts of tourism have been analysed e.g. by Mason (2003). With the population indicator, human pressure on ecological connectivity shall be represented. It is expressed as a classification of population density.

2 Data

A population density grid covering the European Union and disaggregated with CORINE landcover (Gallego, 2010) was used in combination with Swiss Geostat data 2015 (BfS, 2016) covering Switzerland. Both datasets have a spatial resolution of 100m. While the Swiss Geostat dataset is updated annually and is based on geolocated inhabitant numbers, the European dataset was created once and is based on a spatial disaggregation with CORINE land use categories, thus based on satellite images.

3 Processing and classification

After transformation and preparation of the datasets, they are mosaicked into one dataset – resulting in a EUSALP-wide population density grid. Because the effect of human population density is not limited to settlements, a kernel density estimation with a radius of 1500 m was applied to the population density grid. A new grid consisting of the maxima of both grids (human population density and kernel estimation) was calculated. This raster was reclassified according to the classification scheme in Table 1.

Table 1: Classification scheme

Inhabitants per ha	Indicator value
≤ 2	10
2 - 5	9
5 - 9	8
9 - 16	7
16 - 26	6
26 - 43	5
43 - 67	4
67 - 106	3
106 - 172	2
172 - 300	1
> 300	0

4 References

- BfS, 2016, STATPOP2015, Bundesamt für Statistik, Bern.
- Gallego, F. J., 2010, A population density grid of the European Union, *Population and Environment* **31**(6):460-473.
- Luck, G. W., 2007, A review of the relationships between human population density and biodiversity, *Biological Reviews* **82**(4):607-645.
- Mason, P., 2003, Tourism planning and management and the host community, pp. 117-124.
- Millennium Ecosystem Assessment, 2005, Synthesis report, in: *Island, Washington, DC*.