

Research for Measuring Sustainable Land Use and the Quality of Nature: The German Sustainability Indicator for Species Diversity as a New Tool

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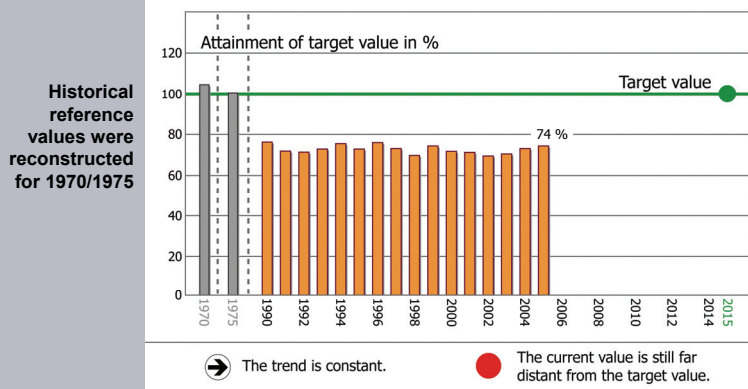
Introduction: The German Federal Agency for Nature Conservation (BfN) has led several research projects to develop a monitoring scheme and the German Sustainability Indicator for Species Diversity (SISD), which depicts the state and quality of nature under the impact of various kinds of land use in Germany [1, 2]. Three main instruments must be available to advise policy makers in terms of nature conservation and sustainability: (i) Representative and reliable monitoring data about the state of nature, (ii) a scientifically sound indicator to process and condense complex biological information to easily understandable messages and (iii) effective communication tools to reach the public, stakeholders and policy makers.

Sustainability Indicator for Species Diversity

Overall indicator

State of nature and landscape in Germany in response to sustainable land use

(Sub-indicators are weighted with their proportion at the total surface area of Germany)



An expert panel has determined a target value to be attained until 2015.

Indicator curve: The curve starts in 1990 and is updated annually. For 1970 and 1975 historical reference values were reconstructed. In 2005, SISD was at 74 % in relation to the target for 2015. The measured trend between 1990 and 2005 was relatively stable fluctuating around 70 %. The bird populations strongly declined before 1990. Currently, the SISD delivers a clear message: to reach the target in time, sustainability policy must be much more strengthened.

Sub-indicators

State of the six main habitat and landscape types in Germany

50 % 27 % 11 % 6 % 3 % 3 %

Farmland	Forests	Settlements	Inland waters	Coast/sea	Alps
<ul style="list-style-type: none"> Whinchat Skylark Yellowhammer Corn bunting Woodlark Lapwing Red-backed shrike Red kite Little owl Black-tailed godwit 	<ul style="list-style-type: none"> Grey-headed woodp. Nuthatch Lesser spotted woodp. Middle spotted woodp. Lesser spotted eagle Black woodpecker Black stork Marsh tit Coal tit Wood warbler Willow tit 	<ul style="list-style-type: none"> Jackdaw Redstart Serlin Green woodpecker Black redstart House sparrow Swift House martin Swallow Wryneck 	<ul style="list-style-type: none"> Kingfisher Common sandpiper Great crested grebe Red-crested pochard Bittern Marsh harrier White-tailed eagle Reed warbler Water rail Little grebe 	<ul style="list-style-type: none"> Oystercatcher Eider Common tern Hen harrier Arctic tern Red-breasted merganser Redshank Ringed plover Guillemot Little tern 	<ul style="list-style-type: none"> Alpine accentor Capercaillie Bonelli's warbler Three-toed woodpecker Nuthatch Ring ouzel Robin Golden eagle Treecreeper Willow tit

Photographs: M. Holze, www.photocase.de

Indicator concept: The German SISD is the leading national nature conservation policy indicator and uses living organisms for indication. SISD summarizes the trends in abundance of 59 selected, representative breeding bird species, which sensitively respond to land use changes. An expert panel has determined a target value for each single bird species, which should be attained until 2015, provided that the guidelines for sustainable development and the legislation on nature conservation will be completely implemented in Germany. The SISD is based on data from nationwide bird monitoring programmes coordinated by the Federation of German Avifaunists.

Indicator calculation: After standardisation of the population sizes at 100 % for the 2015 goal for all selected species, the deviation in percentage from those values can be computed for any individual year. The arithmetic mean of the percent target value attainments gives the sub-indicators of each single habitat and landscape type: farmland, forest, settlement, inland waters, coast/sea, Alps. Finally, the partial indicators are aggregated to the overall index by weighting with the proportion of the respective habitat types at the total surface area of Germany. If habitat quality improves owing to sustainable use or removal of adverse pressures, this will result in increasing population sizes of species contributing to the SISD.

Indicator reports: The German SISD is currently used to report on the progress of the German National Sustainability Strategy. It is also proposed to contribute to similar reports dealing with biodiversity on a national level – e. g. German National Biodiversity Strategy – and European level – e. g. programme to support rural development (council regulation (EC) No 1698/2005 as part of the EU Common Monitoring and Evaluation Framework).

References

- [1] ACHTZIGER, R., STICKROTH, H. & ZIESCHANK, R. (2004): Nachhaltigkeitsindikator für die Artenvielfalt – ein Indikator für den Zustand von Natur und Landschaft in Deutschland. – Angewandte Landschaftsökologie 63: 137 S.
- [2] ACHTZIGER, R., STICKROTH, H., ZIESCHANK, R., WOLTER, C. & SCHLUMPRECHT, H. (2007): Nachhaltigkeitsindikator für die Artenvielfalt – Weiterentwicklung eines Indikators für den Zustand von Natur und Landschaft in Deutschland. – Naturschutz und Biologische Vielfalt: in prep.