A future task in good hands

Federal Agency for Nature Conservation

German experience with infrastructure development and mitigation of related impact

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Mongolia
2.8 Million
2.08 People/sqkm
Germany
80 Million
> 230
People/sqkm

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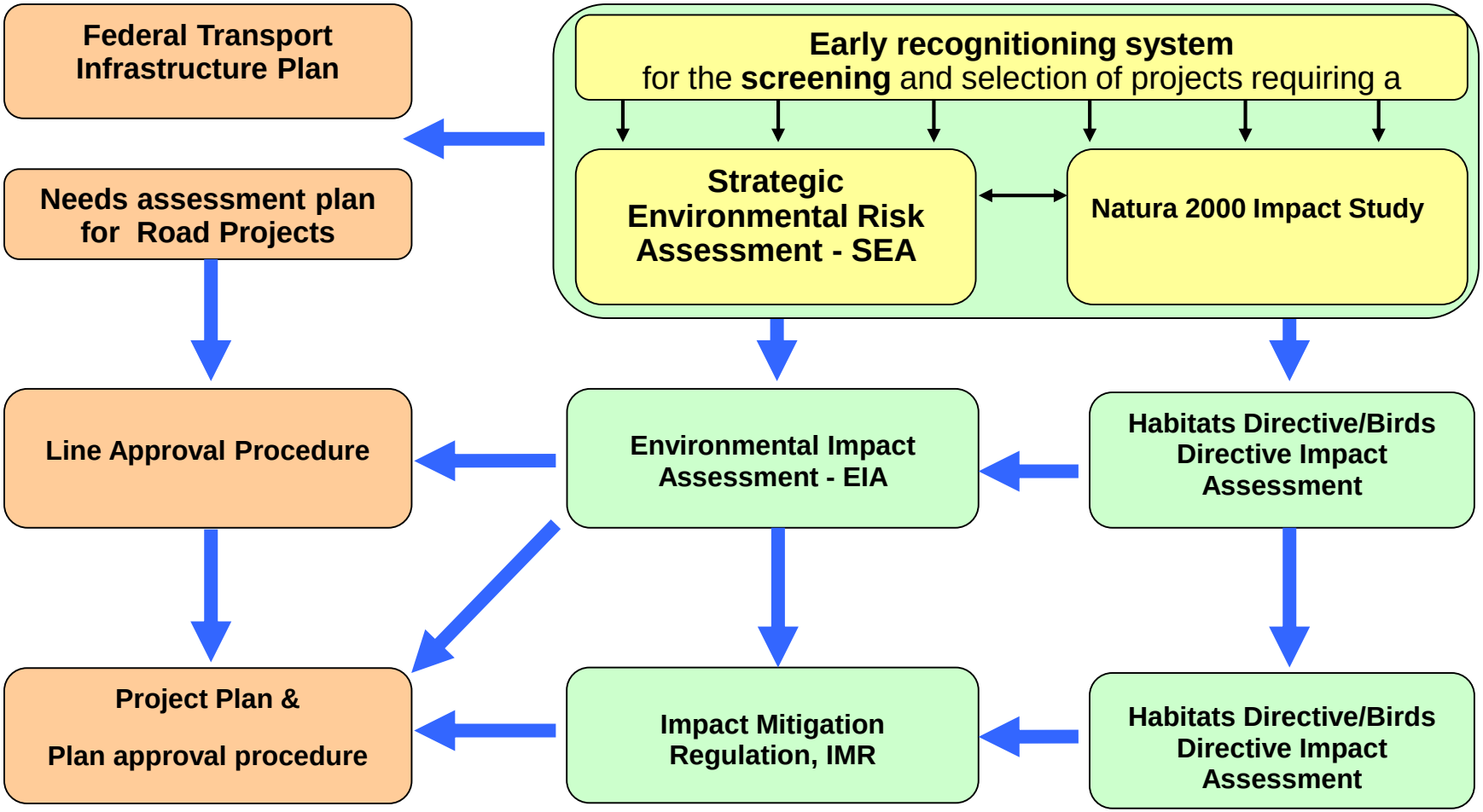
Contents

1. Relations between Federal Transport Infrastructure Planning and EU-Directives, National Nature Conservation Law
2. Pre-Construction: SEA, EIA and MIR Planning scale and instruments (e. g. maps)
3. Post-Construction: Federal Defragmentation Program
4. Design of over-/underpasses: what species are we aiming at?

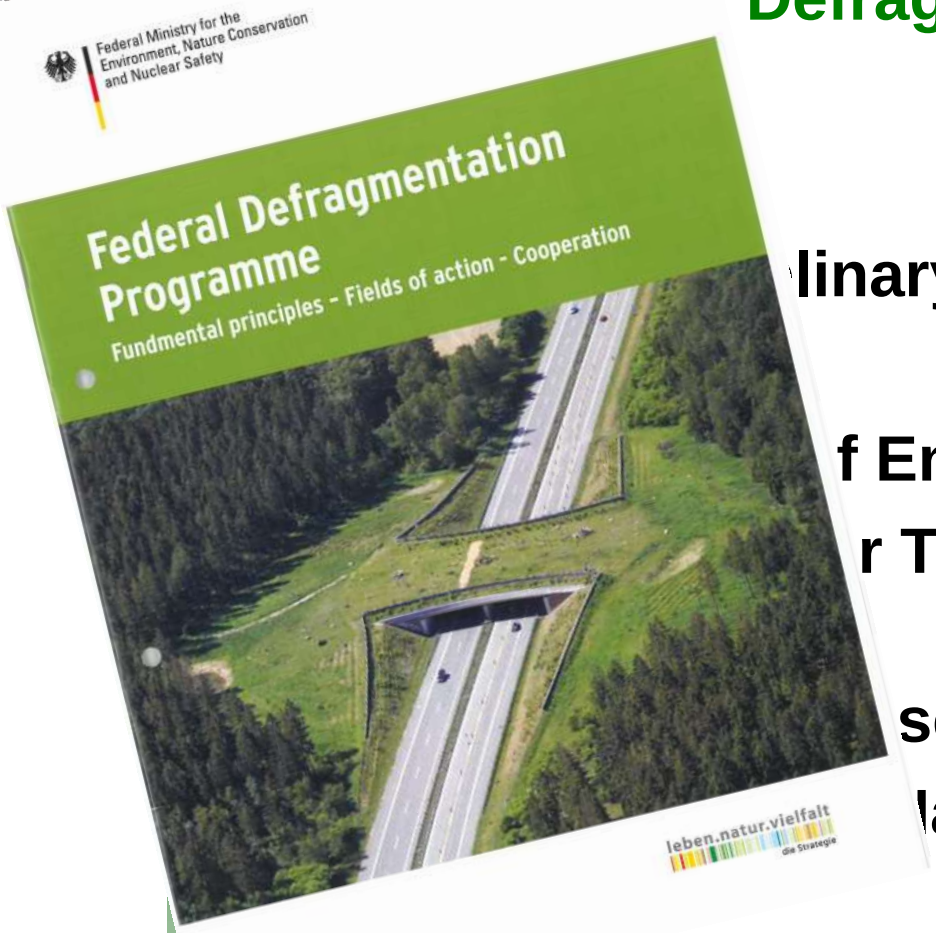
Federal Transport Infrastructure Planning (Federal Highways) and **Relations between EU-Directives, National Nature Conservation Law and**



SEA, EIA and MIR
Planning scale and instruments (e. g. maps)

Regulations based on European Directives (transformed in national law) and national law	Scale	Criteria to assess the severity of the impact on the connectivity of habitats of national interest
Strategic Environmental Impact Assement (SEA) http://ec.europa.eu/environment/eia/sea-legalcontext.htm	1:50.000	**Undissected functional areas (UFR)**  Map of undissected functional areas
Enviromental Impact Assessment (EIA) http://ec.europa.eu/environment/eia/sea-legalcontext.htm	1: 25.000 – 1: 10.000	**Fragmentation of existing Habitat Networks**  e. g. Map of migration corridors for woodland species
Mitigation Impact Regulation http://www.wipo.int/wipolex/en/details.jsp?id=10153	1:5.000 – 1:1.000	**concrete measures to maintain the connectivity** 

Post C ion mitigation: Some facts about the Defragmentation Program



linary work between

f Environment and Building

r Transport and Digital

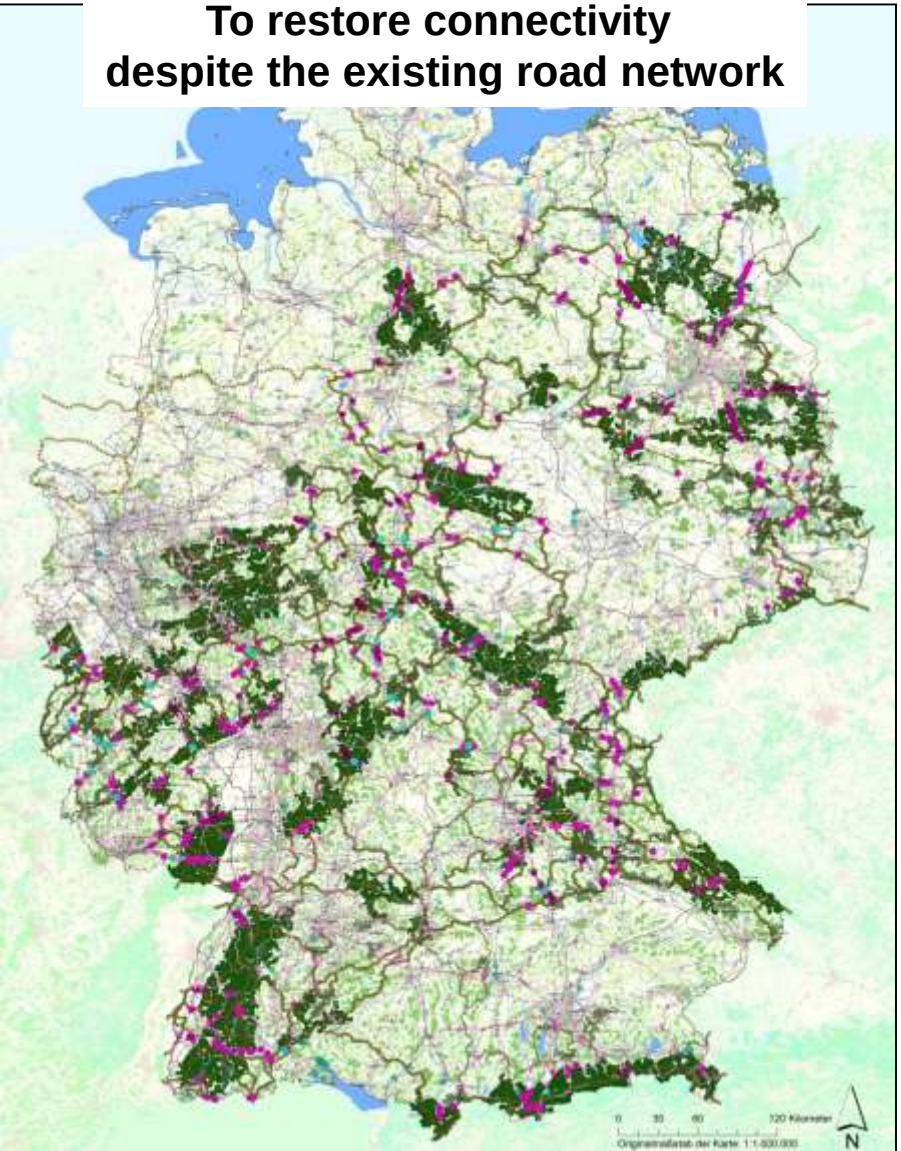
seach Institute

lature Conservation

Adopted by the German Cabinet in 29. February 2012

The German Defragmentation Program two main goals

To restore connectivity despite the existing road network



But also pre construction: To avoid fragmentation when planning new roads

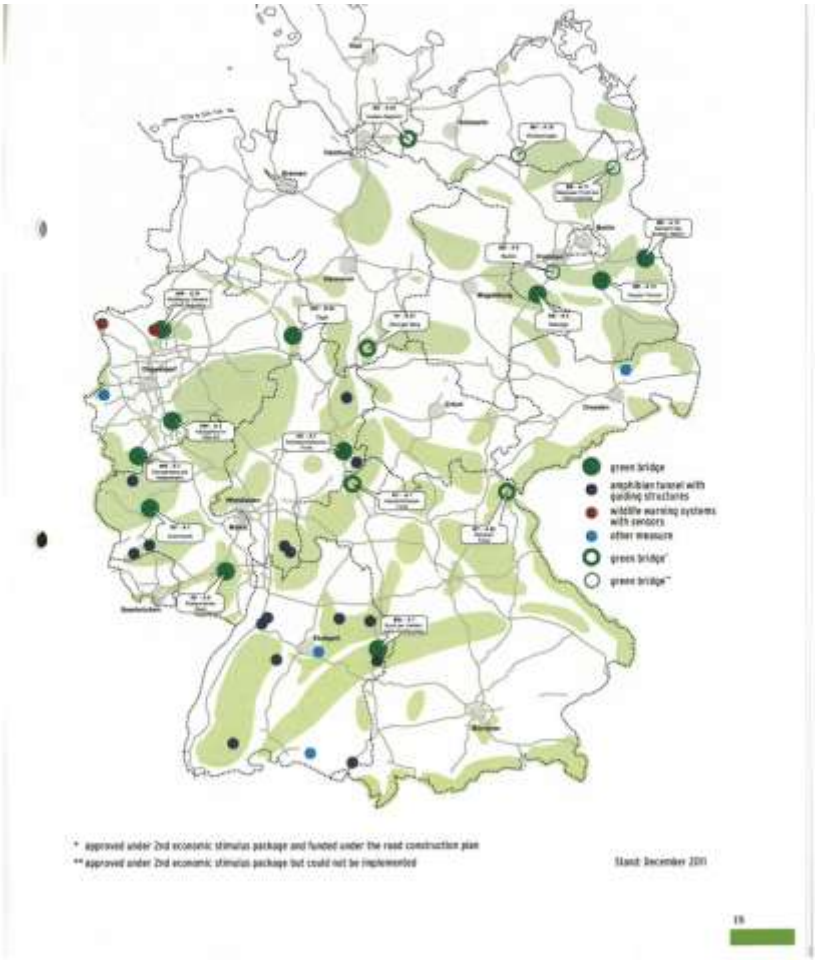
Defragmentation in the existing road network - the most important areas from the national point of view

List of sections with high defragmentation priority

Land	Road	Section
BW	A 5	südlich Rastatt/Niederbühl Oberrhein-Schwarzwald: (gemeinsam mit Bahnüberführung Ubsen)
BW	A 5	nördlich Riegel (gemeinsam mit Bahnüberführung Ubsen)
BW	A 5	südlich Karlsruhe Hardtwald (gemeinsam mit Bahnüberführung Ubsen)
BW	A 5	südwestlich Freiburg Mooswald
BW	A 8	westlich Ispringen Nordschwarzwald
BW	A 8	östlich Pforzheim Schwarzwald-Teilraum Hagenschieß
BW	A 8	nördlich Laichingen (Widderstall) - östlich Merklingen Schwäbische Alb
BW	A 81	östlich Oberdorf am Neckar Schwäbische Alb und Schwarzwald
BW	B 10	südlich Geißlinger Steige/Raum Amstetten Schwäbische Alb (gemeinsam mit Bahnüberführung Ubsen)
BW	B 14	zwischen Herrenberg und Nufringen Schwarzwald - Naturpark Schönbuch) (gemeinsam mit Bahnüberführung Ubsen)
BW	B 31	östlich Titisee Neustadt Schwarzwald
BW	B 35	südlich Maulbronn Stromberg
BY	A 3	zwischen westlich Velburg und östlich Parsberg Mittlere Frankenalb
BY	A 3	östlich Neumarkt Mittlere Frankenalb
BY	A 3	nordwestlich Rohrbrunn Spessart
BY	A 3	westlich Geiselwind Steigerwald
BY	A 6	zwischen Nürnberg und Altdorf Mittlere Frankenalb
BY	A 8	östlich Feldwies Chiemsee, Tiroler Achen
BY	A 9	zwischen Pfaffenhofen und Simmelsdorf Nördliche Frankenalb

Land	Road	Section
BY	A 9	zwischen Bad Berneck und Münchberg Fichtelgebirge - Thüringer Wald
BY	A 9	südlich Hummeltal Nördliche Frankenalb
BY	A 9	östlich Thalmässing oder Raum Kinding/ Altmühl Südliche Frankenalb („Allachse") (gemeinsam mit Bahnüberführung Ubsen)
BY	A 9	Köschinger Forst zwischen Denkendorf und Stammham Südliche Frankenalb (gemeinsam mit Bahnüberführung Ubsen)
BY	A 70	nördlich Hollfeld Nördliche Frankenalb
BY	A 93	bei Wiesau Oberpfälzer Wald
BY	A 93	südlich Rabburg oder bei Teublitz, Sarnsbacher Forst nordwestlich Regenstauf oder nördlich Zeitlarn Verbindung Frankenalb und Bayerischer Wald
BY	A 95	zwischen Eschenlohe und Murnau Verbindung Murnauer Moos mit Loisach Aue
BY	B 2	östlich Garmisch-Partenkirchen Werdenfelser Land
BY	B 2	zwischen Krün und Mittenwald Buckelwiesen
BY	B 23	westlich Oberau Ammergauer Alpen
BY	B 308	zwischen Sonthofen und Bad Hindelang Allgäuer Alpen
BB	A 2	südlich Wenzlow Vorfläming
BB	A 10	westlich Ludwigsfelde Naturpark Nuthe-Nieplitz
BB	A 10	nordwestlich Marquardt Havelland
BB	A 11	östlich Parlow Schorfheide
BB	A 12	südwestlich Fürstenwalde Spreegebiet
BB	A 13	bei Bronkow Lausitz
BB	A 24	nordwestlich Fretzdorf Wittstock-Ruppiner Heide/Dosse
BB	A 24	südlich Fretzdorf/nördlich Warsleben Wittstock-Ruppiner Heide/Dosse

18 measures financed by the current economic German program to support building companies (ca. 80 Mio. €)



Dimension of different types of Over- and Underpassages

Overpasses (usable width/diameter):

- **Landscape bridge: more than 80 m**
- **Greenbridge: 50 m to 80 m**
- **Fauna passage: less than 50 m**

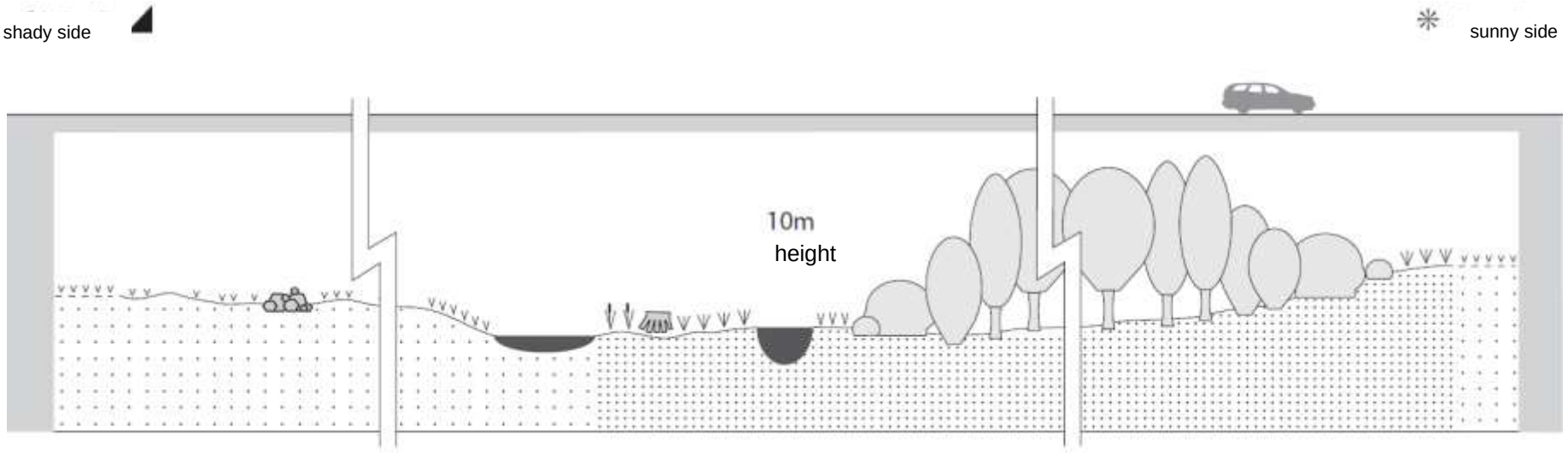
Underpasses:
Bridges: clearance diameter more than 2 m

- **Green passage: more than 80 m**
- **Waterbody passage: between 2 m and 80m**
- **Fauna underpassage: between 2 m and 80 m**

Passage for small animals (culvert):
clearance and usable diameter less than 2 m

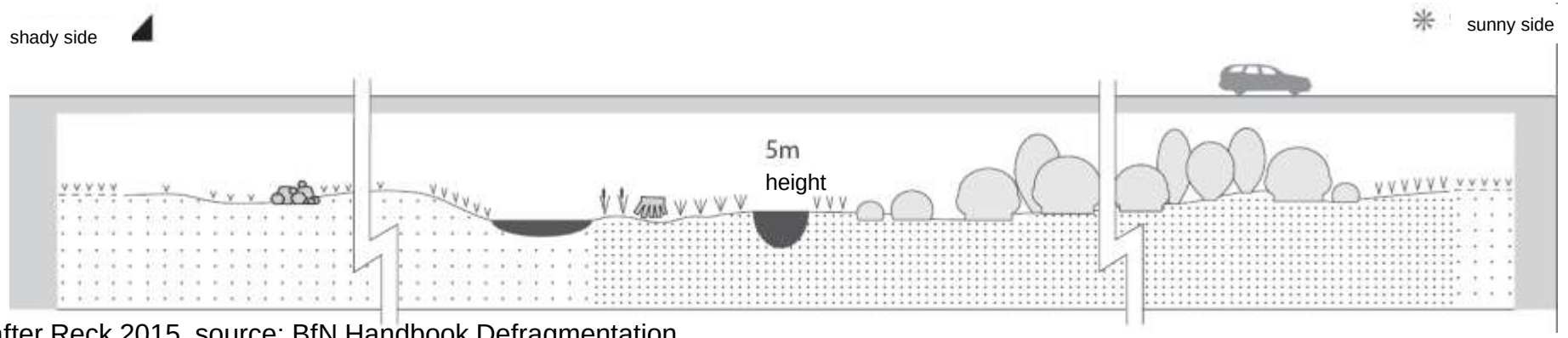
Formal principles for underpasses: here Viaduct

Tall Viaducts to connect woodland habitats



Low Viaducts to connect woodland habitats

=>For broad roads where required a wide gap for natural light (by moving the two directions further apart) should be built, but making sure that no permanent water expanse is created under the viaduct



after Reck 2015, source: BfN Handbook Defragmentation

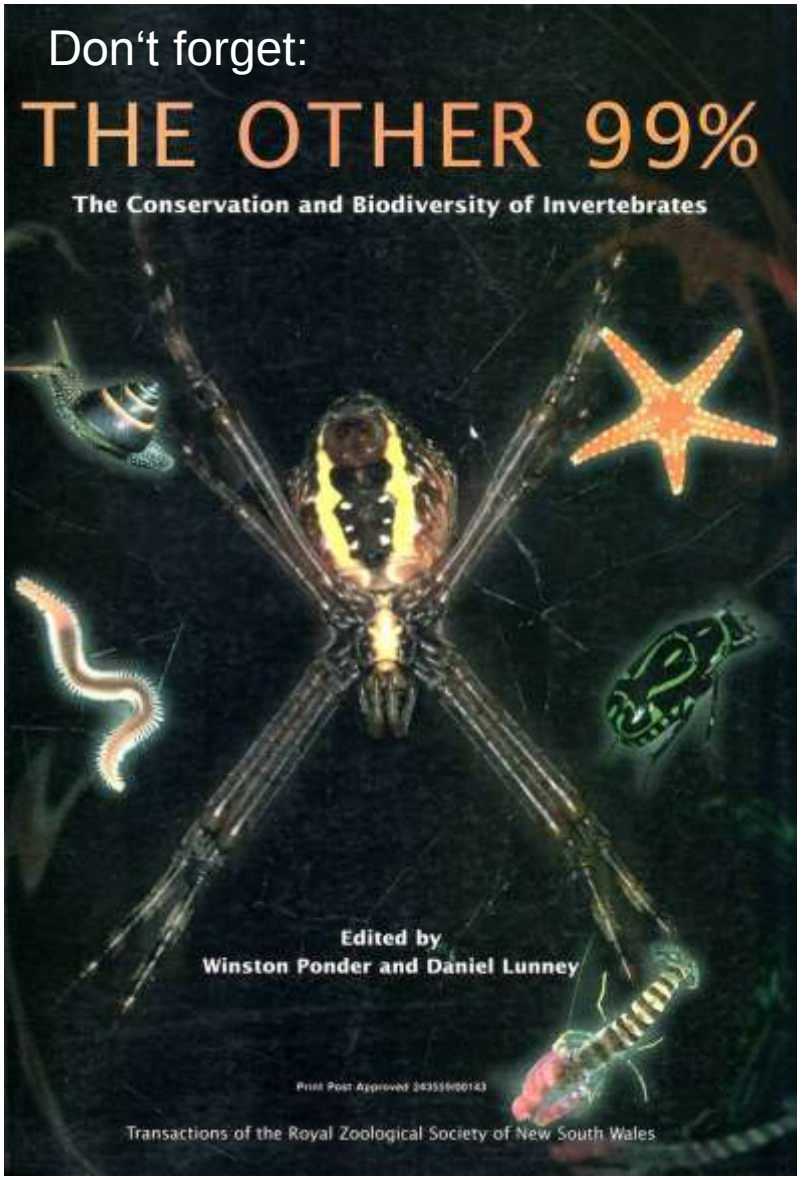
What animals are we aiming at?

Different requirements!
Fauna passages that are suitable for

paw-footed mammals
are not always useful
for hoofed mammals

and too often not useful at all for small animals and insects

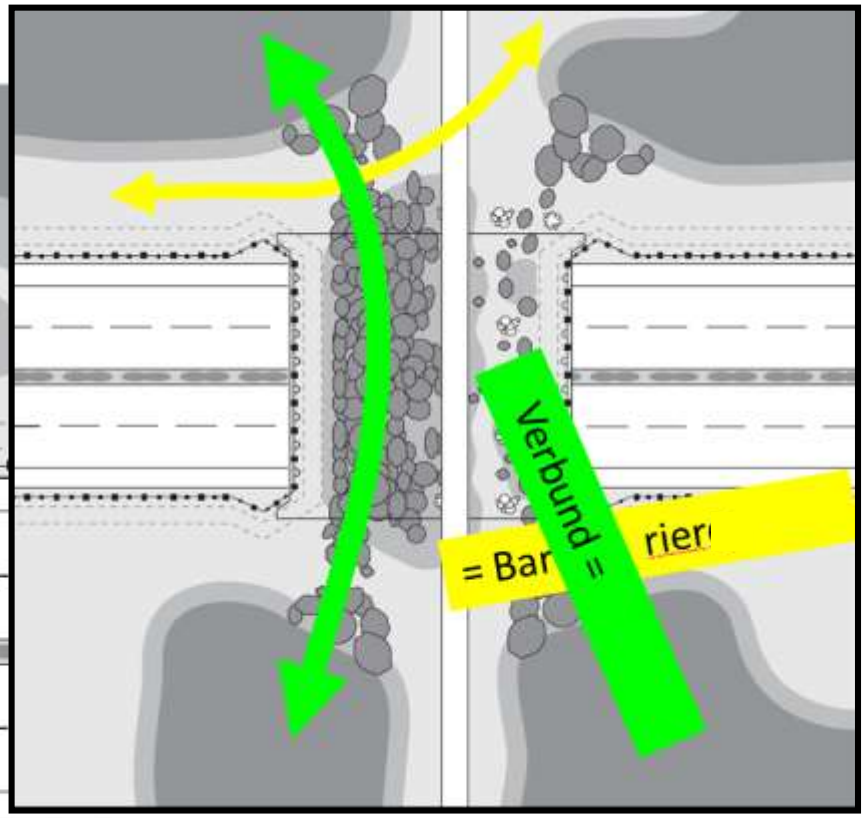
Don‘t forget:



after Reck 2012

Design-principles: Stepped areas and Mosaic structures (1)

Shady side



poor soil/
open ground

eutrophical soil/
verges

Woodland or rather
coppice

Woodland with verge

Water body

If necessary
managed
area with grass

Veterinary fence
with defender for
small animals

Veterinary fence
with slope soil

after Reck 2015, source: BfN Handbook Defragmentation

Design-principles: surface and management, hiding places and damage caused by game

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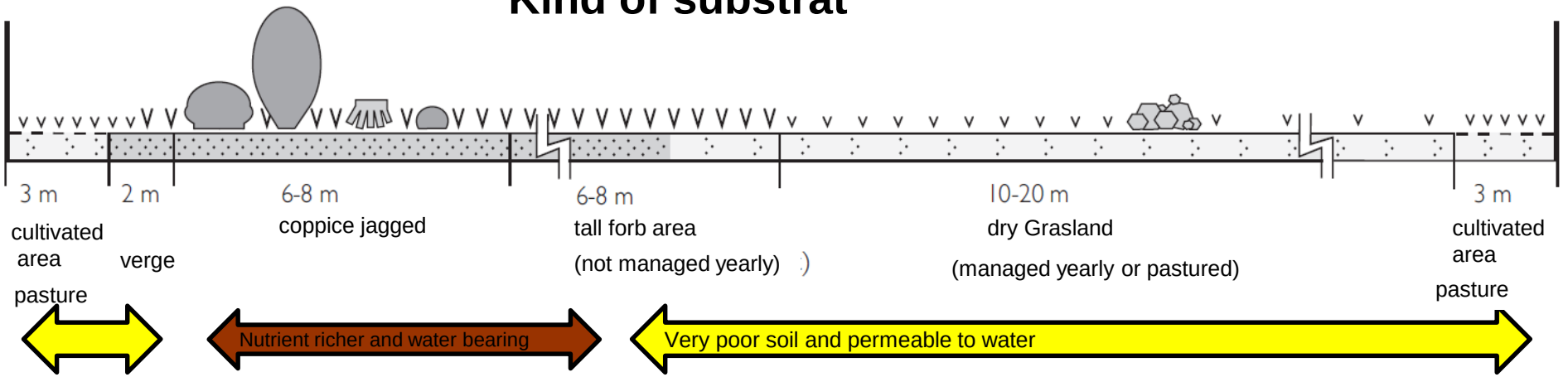
Shady side

Sunny side

Kind of substrat



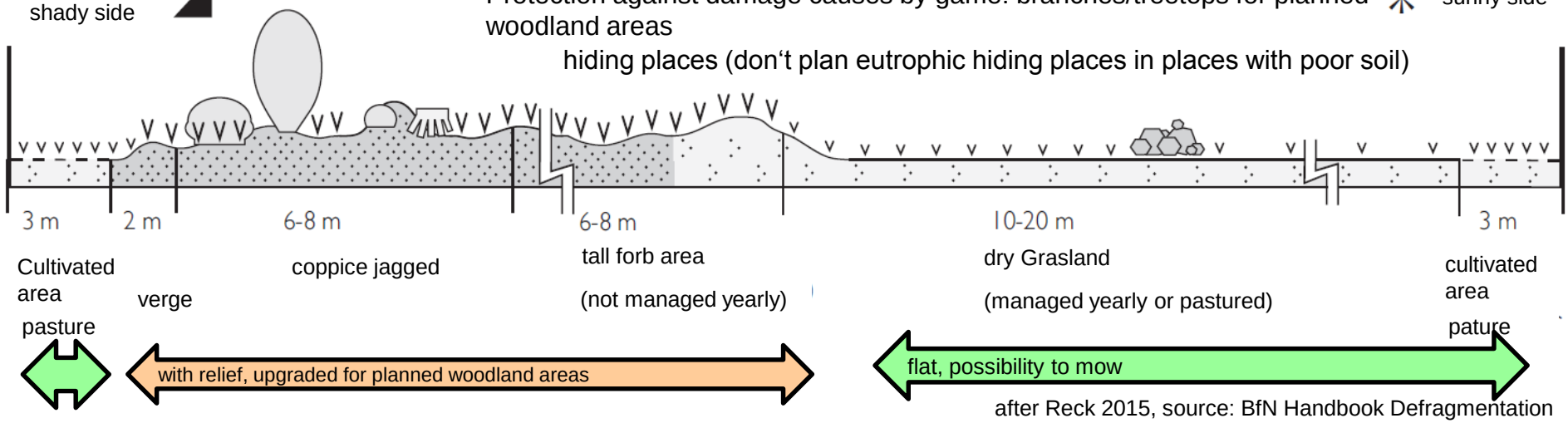
Design of surface: floor unevenness (schematic)

shady side

Protection against damage causes by game: branches/treetops for planned woodland areas

hiding places (don‘t plan eutrophic hiding places in places with poor soil)

sunny side



after Reck 2015, source: BfN Handbook Defragmentation

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German Impact Mitigation Regulation

Impact Mitigation Regulation ("Eingriffsregelung") is the major landscape conservation instrument to address mitigation and compensation for impacts from developments and projects in Germany:

- entered into force as part of the Federal Nature Conservation Act 1976
- comprehensive approach (for all impacts, on all scales, not restricted to specific areas)
- 2002 and 2009 amendments to the Federal Nature Conservation Act: loosening of spatial and functional connection between impact and compensation
- compensation pools: provision and bundling of compensation sites and measures