

REGIONAL ASSESSMENT REPORT ON BIODIVERSITY AND ECOSYSTEM SERVICES FOR EUROPE AND CENTRAL ASIA							
Comments external review second order draft - Chapter 5							
Reviewer Name	Chapter / SPM	From Page	From Line	To Page	To Line	Comment	Response
Ilya Gasan Osojnik Črnivec	0	0	0			local and native breeds are two interchangeable terms, for greater clarity, I would recommend only one expression is used for the whole publication.	The two terms address slightly different issues, as local breeds denotes breeds present only in a distinct region, and native breeds denotes breeds which had sufficient time to adapt to specific local conditions.
Brendan Coolsaet	0	0	0			All documents include big differences in the quality of the writing. Everything should be thoroughly proof-read and edited by native speakers.	This has been done throughout
Brendan Coolsaet	0	0	0			Use of genetic resources and Nagoya protocol are notably absent in most of the chapters	Limited or unequal access to NCP or genetic resources is now mentioned where appropriate.
Brendan Coolsaet	0	0	0			For reviewing purposes, it may be useful to indicate the gender-balance and 'discipline-balance' within the group of authors (could be illustrated with a gauge at the beginning of each doc for example). This will facilitate identifying biases	The complete authorship is listed at the beginning of each chapter. Statistics on gender and disciplinary balance are available from the ECA TSU and IPBES Secretariat
Germany	0	0	0			We believe that the regional ECA assessment generally has a comprehensive and scientifically sound structure. However, linkages between the chapters, especially for chapters 6, are not that strong yet. For instance, it is not clear in how far chap. 6 builds upon the findings and insights of the analyses within the previous chapters. While the review work, analyses and evaluations made in these chapters are by themselves very insightful, linking more strongly back to the status and trends chapter as well as the drivers/scenarios/visions and pathways chapters would be very useful. For instance, the 'status and trends' chapter 3 might help identify where policy action is most needed and the 'drivers' chapter 4 determines the underlying drivers which need to be addressed by policy action. Giving more weight to these chapters in the discussion of policy options might help to derive more region-based options. As it stands now, many key messages of chapter 6 are of a more general nature.	A comprehensive attempt has been made to cross-reference the different chapters to ensure consistency between them. All chapter texts were screened for potential opportunities for governance or management action and these opportunities are now mentioned in chapter 6 with reference to the chapter of origin.
Germany	0	0	0			This assessment shows some imbalances regarding a lack of coherence in the use of terminology: This can lead to different understandings and also to misinterpretations. For instance, at its last Plenary, the IPBES had agreed to use the term "nature's contributions to people" (NCP) as a synonym for the term "ecosystem services". Unfortunately, the term NCP is now being used in the assessment frequently in a modified form and therefore inconsistently. This aspect needs to be addressed in the assessment as well as in the SPM.	Terminology was systematically checked across the full report
Germany	0	0	0			There are significant contributions and benefits arising from agro-ecosystems. The increase in food, feed and timber production and resulting food security has been mentioned, but not thoroughly discussed. We would therefore ask the authors to extend this discussion and provide a more balanced perspective on the increase in food security over the last decades. Furthermore, information on traditional varieties and breeds or on genetic resources for food and agriculture is missing. Thus, the contributions of agriculture to the biological diversity in the agricultural sector have not been completely considered so far.	We have attempted to address this comment by taking a more balanced perspective on the relative contributions of nature to people especially with respect to food and fibre provision in chapter 2. We have also increased the treatment of genetic diversity of crops and animal breeds in chapter 3.
Germany	0	0	0			Regarding knowledge gaps - please provide a section at the end of each chapter to present the relevant knowledge gaps that were identified from the reviews (for chapter 3 it's missing). It is referred to in the SPM, p. I. 233 that relevant knowledge gaps are identified, so please ensure that all knowledge gaps identified throughout the individual chapters are then summarized and assessed in the corresponding section of knowledge gaps and uncertainties towards the end of each chapter.	Knowledge gaps have been identified for each chapter, as well as being summarised as a box in the SPM
Germany	0	0	0			Some of the chapters (particularly 2, 3, 4, 6) are very long and readers easily lose track as to what type of information is currently presented. Please try to synthesize the information as much as possible and if a lot of information is to be presented provide short summaries or highly important findings.	All of the chapters have been reduced considerably in length
Germany	0	0	0			There are still some gaps, placeholders or work in progress in the SOD. This makes it partly difficult to comment. Please fill these gaps effectively.	Gaps have been filled throughout the document
Germany	0	0	0			We urgently request the chapter authors to ensure that all facts and figures contained in the chapters are accurately cited and adequately referenced with up-to-date sources. We also encourage chapter authors to cross-check whether the same facts and figures on a specific topic are being used throughout the assessment. Please make sure that all key messages are backed up by facts and figures.	The use of evidence sources has been comprehensively checked across the document, especially including those that integrate across chapters
Germany	0	0	0			Please explain all abbreviations when first used and then use them coherently afterwards (e.g. ILKP in the SPM)	All abbreviations have either been spelt-out or defined on first use
Belgian government - Hilde Eggermont (IPBES National Focal Point)	0	0	0			All documents include big differences in the quality of the writing. Everything should be thoroughly proof-read and edited by native speakers.	The document has been comprehensively reviewed by native English speakers
Belgian government - Hilde Eggermont (IPBES National Focal Point)	0	0	0			Use of genetic resources and Nagoya protocol are notably absent in most of the chapters	Limited or unequal access to NCP or genetic resources is now mentioned where appropriate.
Belgian government - Hilde Eggermont (IPBES National Focal Point)	0	0	0			For reviewing purposes, it may be useful to indicate the gender-balance and 'discipline-balance' within the group of authors (could be illustrated with a gauge at the beginning of each doc for example). This will facilitate identifying biases	The complete authorship is listed at the beginning of each chapter. Statistics on gender and disciplinary balance are available from the ECA TSU and IPBES Secretariat
Belgian government - Hilde Eggermont (IPBES National Focal Point)	0	0	0			no reference to Nature-based solutions, though very relevant in this assessment (i.e. in the different Chapters and SPM)	The NBS concept is referenced where there is literature and evidence to support its use
Anatoliy Khapugin	0	0	0	0	0	Through the whole assessment, there are many cases of mixture English (British+American): e.g., ch.1, p. 12, line 333 (prioritize) vs. ch.1, p. 4, line 83 (recognised), etc. I think, some one of English forms should be used through the whole assessment. Also, there are many mistakes (or it is a lack of standards of formatting) for references style. I would recommend check it through the whole assessment. I didn't add concrete recommendations because I don't know what format of references and references style should be used	The document language has been systematically edited by native English speakers
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0			We would recommend that the IPBES Core Indicator 'Marine Trophic Index' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Dirk Zeller (email: d.zeller@oceans.ubc.ca).	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0			We would recommend that the IPBES Core Indicator 'Proportion of local breeds, classified as being at risk, not-at-risk or unknown level of risk of extinction' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Roswitha Baumung (email: Roswitha.Baumung@fao.org)	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.

UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Core Indicator Percentage of Category 1 nations in CITES is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Tom De-Meulenaer (email: <a href="mailto:Tom.DE-MEULENAER@cites.org">Tom.DE-MEULENAER@cites.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Core Indicator 'Nitrogen + Phosphate Fertilizers (N+P205 total nutrients)' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Francesco Tubiello (email: <a href="mailto:francesco.Tubiello@fao.org">francesco.Tubiello@fao.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Core Indicator 'Trends in Pesticide Use' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Francesco Tubiello (email: <a href="mailto:francesco.Tubiello@fao.org">francesco.Tubiello@fao.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Core Indicator 'Percentage of Undernourished People' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Carlo Cafiero (email: <a href="mailto:Carlo.Cafiero@fao.org">Carlo.Cafiero@fao.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Wetland Extent Trend Index' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Sarah Darrah (email: <a href="mailto:Sarah.Darrah@unep-wcmc.org">Sarah.Darrah@unep-wcmc.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Trends in invasive alien species vertebrate eradication' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Shyama Pagad (email: <a href="mailto:s.pagad@auckland.ac.nz">s.pagad@auckland.ac.nz</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator RAMSAR areas is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Maria Rivera (email: <a href="mailto:RIVERA@ramsar.org">RIVERA@ramsar.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Number of countries with national instruments on biodiversity relevant tradable permit schemes' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . These indicators are country-specific, so they can be disaggregated by countries in your region. However, given the incomplete country coverage, any regional aggregates cannot be taken to represent the entire region. Currently we have data on about 58 countries. [Just to note, we also have information on countries with biodiversity-relevant taxes in place]. More information on this is available from the Indicator Focal point Katia Karousakis (email: <a href="mailto:Katia.KAROUSAKIS@oecd.org">Katia.KAROUSAKIS@oecd.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Trends in potentially harmful elements of government support to agriculture (produced support estimates)' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator is available for the OECD as a whole and has not been disaggregated as such. The original data on (total) government support to agriculture is available on the OECD website by country. More information on this is available from the Indicator Focal point Katia Karousakis (email: <a href="mailto:Katia.KAROUSAKIS@oecd.org">Katia.KAROUSAKIS@oecd.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Better Life Index' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . The data is available for only 38 countries and therefore it would be difficult to be used regionally the way IPBES has classified these. More information on this is available from the Indicator Focal point Katia Karousakis (email: <a href="mailto:Katia.KAROUSAKIS@oecd.org">Katia.KAROUSAKIS@oecd.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Protected area coverage of terrestrial, marine and freshwater ecoregions' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Ed Lewis (email: <a href="mailto:Edward.Lewis@unep-wcmc.org">Edward.Lewis@unep-wcmc.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Growth in species occurrence records accessible through GBIF' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Tim Hirsch (email: <a href="mailto:thirsch@gbif.org">thirsch@gbif.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Robert Hoff (email: <a href="mailto:robert.hoff@cbd.int">robert.hoff@cbd.int</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Information provided through the financial reporting framework, adopted by decision XII/3' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Robert Hoff (email: <a href="mailto:robert.hoff@cbd.int">robert.hoff@cbd.int</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the IPBES Highlighted Indicator 'Number of world natural heritage sites per country per year' is used in this assessment. Indicator information is available from the IPBES Indicator portal and the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Douglas Nakashima (email: <a href="mailto:D.Nakashima@unesco.org">D.Nakashima@unesco.org</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Trends in Loss of Reactive Nitrogen to the Environment' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Albert Bleeker (email: <a href="mailto:Albert.Bleeker@pbl.nl">Albert.Bleeker@pbl.nl</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Wild Bird Index (forest & farmland specialist birds)' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Richard Gregory (email: <a href="mailto:richard.gregory@rspb.org.uk">richard.gregory@rspb.org.uk</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Climatic impacts on European and North American birds' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Richard Gregory (email: <a href="mailto:richard.gregory@rspb.org.uk">richard.gregory@rspb.org.uk</a> )	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.

UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Ocean Health Index' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Benjamin Halpern (email: halpern@nceas.ucsb.edu)	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Cumulative Human Impacts on Marine Ecosystems' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Benjamin Halpern (email: halpern@nceas.ucsb.edu)	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Shyama Pagad (email: s.pagad@uckland.ac.nz)	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Biodiversity Barometer' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Rik Kutsch Lojenga (email: rik@ethicalbiotrade.org)	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Red List Index (impacts of utilisation)' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Tom De-Meuilaenaer (email: Tom.DE-MEUILENAER@cties.org)	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Water Quality Index for Biodiversity' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Hartwig Kremer (email: hartwig.kremer@unep.org)	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
UNEP-WCMC: The Biodiversity Indicators Partnership (BIP)	0	0	0		We would recommend that the Indicator 'Number of Parties to the CBD that have deposited the instrument of ratification, acceptance, approval or accession of the Nagoya Protocol' is used in this assessment. Indicator information is available from the BIP website <a href="http://www.bipindicators.net">www.bipindicators.net</a> . This indicator can be disaggregated/made available for this region, more information on this is available from the Indicator Focal point Beatriz Gomez (email: beatriz.gomez@cbd.int)	Chapter author teams made use of these core/highlighted/further indicators as far as possible given the delivery late in the process.
EU: Frank Wugt Larsen (EEA)	0	0	0		A few points on references: 1) In general, there is a need to systematically check references in the chapters. Specifically, EEA reports are not referenced consistently, e.g. in some chapters it is EEA XXXX, while in other chapters European Environment Agency XXXX. 2) Chapter 3 doesn't seem to contain any reference to EEA materials, which seems a bit odd given the many relevant EEA publications. 3) Some EEA references are not the most current one, e.g. Climate change, impacts and vulnerability in Europe 2012 is referenced although there is 2016 report.	References have been systematically checked and standardised throughout the document using the Mendeley bibliographic software.
EU: Frank Wugt Larsen (EEA)	0	0	0		As during last review, we would like to point you to relevant information hosted by the EEA for which we believe a consultation by authors could improve the ECA report. In general, we will also refer to the EEA/ETC BD document 'Information note to IPBES secretariat on EEA and EU information' ( <a href="http://bd.eionet.europa.eu/Reports/ETCBDTechnicalWorkingpapers/PDF/Information_IPBES_on_EEA_EU.pdf">http://bd.eionet.europa.eu/Reports/ETCBDTechnicalWorkingpapers/PDF/Information_IPBES_on_EEA_EU.pdf</a> ), which was shared with the ECA TSU in 2015. Several reports provide a good starting point to find relevant information, incl. EEA, 2015 European environment – state and outlook 2015 (SOER 2015, in particular, thematic briefings and SOER synthesis); EEA 2016. Mapping and assessing the condition of Europe's ecosystems. Progress and challenges; EEA, 2015, State of Nature Report 2015; EEA, 2015, State of Europe's Seas; EEA, 2016. European forest ecosystems – state and trends. In general, the EEA website ( <a href="http://www.eea.europa.eu">http://www.eea.europa.eu</a> ) also provides access to a wealth of relevant indicators and assessments.	EEA sources are highly appreciated and cited throughout the assessment.
Thomas Brooks	0	0	0		Overall: the ECA assessment is looking really good - many congratulations to all the authors. I have focused the great bulk of my comments on issues directly related to data mobilised for the ECA against IUCN standards, especially in the light of the provision of these data for IPBES in <a href="https://www.nature.com/articles/sdata20167">https://www.nature.com/articles/sdata20167</a> , and of IUCN's strategic partnership with IPBES in general.	Thanks for the comment
Switzerland: José Romero	0	0	0		General: establish a glossary as part of this report and include in the glossary words like "cohesiveness"; "regulatory"; "material"; "non-material" NCPs; "trophic level"; "biotic homogenisation".	A glossary has been created as suggested
Switzerland: José Romero	0	0	0		General: in this report, the concept of "trade-off" is used in a rather negative sense, while generally a trade-off is a situation reached for the satisfaction of divergent views and interests, which is considered to be a positive solution. We wonder if this rather negative use of trade-off in the report would be correctly translated in the other non-English languages. For example, in French, we would rather think of a happy outcome when a trade-off (e.g. a compromise, a good deal) is done in front of irreconcilable antagonisms. If the use in this report is more in a negative sense, then why not qualify trade-offs as e.g. "harmful". We hope that the English speakers authors understand our point and find a way out to address it in English as well as in the other non-English languages.	Trade-off is here consistently meant to indicate a negative relation between two variables of interest, e.g. between two NCPs. Mitigation of a trade-off would correspond to your "happy outcome".
The Netherlands: Astrid Hilgers	0	0	0	0	(Financial) cost-benefit analyses for policymakers/society are missing, as it is important to name such considerations explicitly. Also, certain concepts should be defined more precisely.	Discussion of the economics of ES (valuation) has been increased in the document, especially in Ch2
Ramsar Secretariat	0	0	0	0	We recommend that as in the regional assessments for Africa and the Americas, the area of Ramsar Sites, wetlands protected under the Ramsar Convention as internationally important by sub-region, be included in this assessment as an indicator. See: <a href="https://rsis.ramsar.org/">https://rsis.ramsar.org/</a>	Done in chapter 3.
IPBES Knowledge and Data Task Force (KD TF)/ Task Group on Indicators (TGI)	0	0	0		This review provides feedback from the IPBES Knowledge and Data Task Force (KD TF) / Task Group on Indicators (TGI) on the use of IPBES core indicators in your assessment. We see potential for inclusion of additional core indicators and for the more consistent use of the standardized visualizations provided. For information on core indicators potentially relevant to a given chapter, please see <a href="http://www.ipbes.net/indicators">http://www.ipbes.net/indicators</a> (or see the tab named "core indicators" in this spreadsheet) and check the indicator trend graphs shared by your TSU. For the trends of IPBES core indicator, standardized visualizations should be used as much as possible to ensure the consistency between and within the assessments. The KD TF/TGI aim to follow up with specific recommendations in the near future. In the meantime, do not hesitate to reach out to them through your TSU or the KD TF TSU (ipbes.kdtsu@gmail.com).	Chapter author teams made use of the core indicators as far as possible given the delivery late in the process.
Kremena Gocheva	0	0	0		The draft assessment is an impressive and very informative work. It can, also, be seen that the drafting and peer review process are flexible enough to incorporate very recent work despite the long drafting cycle.  It would be helpful to incorporate a feedback mechanism from stakeholders as well, for collecting new information that becomes available on a running basis. For example, the Bulgarian mapping and assessment outside NATURA 2000 - some 66% of the country - for ecosystem condition and biophysical valuation of ecosystem services was completed in April, 2017. IBER-BAS has mapped six of the nine ecosystem types in Bulgaria, and had the lead role in developing the underlying methodological framework. However, the final reports are under verification and publications upon it are still to follow, with findings being systematized. Similarly, work is underway in other countries too.  Therefore, at the current stage the comments are somewhat generic and limited to the general approach (Chapter 1) but it would be suitable, if such a mechanism existed, to keep contributing beyond June 26 until the report is ready. It may be good to allow for submitting links to new publications on a regular basis, so the report authors would get up-to-date information in a timely manner.	Thank you for the suggestion concerning new literature. The IPBES guidelines requires us to establish a cut-off date for literature (April 2017), but we have attempted to be flexible in incorporating more recent, but highly important, material.

Kremena Gocheva	0	0	0		<p>The assessment's description in Chapter 1 appears anthropocentric without a clear focus on humans as part of Nature. Since the Assessment clearly notes (Table 1.1, Figure 1.2) that the IPBES has a scope overarching earlier assessments such as MA, TEEB, MAES by providing a holistic view on Nature, the introduction, too, may need to put more emphasis on the socio-ecological system as a single entity rather than merely a source of benefits to humans.</p> <p>This could lead onto introducing insights at the win-win and lose-lose options, including the ecosystem disservices, as well as a more systemic view at the continuum of states in which the socio-ecological system is evolving over time. It would bring out more clearly the NATURE component of the IPBES CF, in particular its Mother Earth and Systems Values categories which appear to be underrepresented in the current draft. Their equivalent in Western science appears to be not the entire body of knowledge on biodiversity and ecosystems but rather the parts of ecology that treat ecosystems from the energy/energy/entropy/information theory points of view.</p>	Chapter 1 has been edited considerably to adopt a more comprehensive socio-ecological systems approach as well as recognising the intrinsic value of nature and pointing out non-material relational values.
Jean-Paul Hettelingh	Ch.5	0	0		<p>This chapter gives an extensive overview of scenarios and model applications. However, an important set of recently developed, and still applied, RCP scenarios is missing. The chapter is very theoretic dealing with models and scenario approaches. It is recommended that the chapter builds on the relationships between drivers and impacts that have been identified in chapter 4.</p>	The RCPs are included in the review databases (both the scenarios and models reviews). We have attempted to build in more links with Chapter 4 and have indicated these in the Introduction
Mark Rounsevell	Ch.5	0	0		<p>This is looking really good, and a major advance from the FOD. I've added comments throughout, but my main points concern what I see as omissions in the chapter text, which are:</p> <p>a) You've explicitly excluded sub-national scenario studies, but I think this misses a wealth of important research that could be usefully assessed. Comparing sub-national scenario study outcomes with those of higher scale levels would also be useful, with potential implications for the conclusions for decision-making. The other reason to include sub-regional scenarios is that these often better connect with IPBES issues, e.g. quality of life, ecological networks and species modelling, which the higher scale level scenarios don't always do (which I think you've concluded somewhere). I've given some (non-exhaustive) examples in the text (sorry for the self-citation!);</p> <p>b) There is no discussion of the importance of model type used in quantifying narrative storylines. A couple of recent papers on land cover change have highlighted the uncertainties associated with model type (and initial data classes). In most cases the variability arising from model (and data classification) differences is greater than the differences between the scenarios. There are also geographic differences, i.e. parts of ECA (e.g. Russia, I think), where models do not agree at all well. The other paper given below demonstrated how data sampling creates greater uncertainty than scenario differences. It's important that these types of uncertainties are highlighted and perhaps also indicated as a knowledge gap. There are also many other publications (for the ClimSAVE scenarios) that formally explore scenario uncertainty, including taking a conditional probabilistic approach.</p> <p>c) It would be useful to have some form of summary table or list that summarises the 'vision' studies and their main components/characteristics (section 5.4.3), as was done for the exploratory scenarios in section 5.2.2.</p> <p>Alexander et al (2016). Assessing uncertainties in land cover projections. Global Change Biology, doi 10.1111/gcb.13447  Prestele et al (2016). Hotspots of uncertainty in land use and land cover change projections: a global scale model comparison. Global Change Biology, 22, 3967-3983 doi: 10.1111/gcb.13337  Dendoncker et al. (2008). Exploring spatial data uncertainties in land use change scenarios. International Journal of Geographical Information Science, 22, 1013-1030</p>	<p>a) It was not possible to undertake a comprehensive review of sub-national scenarios due to the overwhelming number of them, many of which are not published in English. However, we have reviewed a number of them and emphasise their importance in a box on local participatory scenario planning (Box 5.2). Sub-national modelling studies are included and have been now been treated more explicitly in Section 5.3 and are given more importance in the reporting of the results across scenarios archetypes. b) We have added a box to Section 5.3 to discuss model type and uncertainties. This includes different types of integrated models, and a discussion of different sources of uncertainty and how these vary between single component and integrated models (see Box 5.4).</p>
Ilya Gasan Osojnik Črnivec	Ch.5	0	0		ILKP was explained in Ch.4, ILKC is not explained in text	We have removed the term ILKC
Robert Watson	Ch.5	0	0		An assessment of NCP under future scenarios in chapters 5 is needed.	Impacts of scenarios on different NCP are included in Section 5.3. Results are synthesised and discussed by scenario archetype.
Bruno Fady	Ch.5	0	0	0	Euforgen, the European programme for forest genetic resources, is never mentioned. This more than 20 year old programme ( <a href="http://www.euforgen.org/">http://www.euforgen.org/</a> ) is a success for raising awareness of and implementing strategies for conservation of genetic diversity across Europe	Unfortunately, we could not find any futures-related work on the homepage
Germany	Ch.5	0	0		Please provide short explanations of key terms (e.g., scenario archetypes) in the executive summary	We now avoid using the term scenario archetype in the Executive Summary (we stick to the term scenarios, which is more widely understood). Scenario archetypes are explained in detail in Section 5.2 when they are first introduced.
Germany	Ch.5	0	0		The role of investment for sustainable development is mentioned as one of the research questions, which the ECA assessment should address (see IPBES/3/18, A. Scope). Though 'investment' is mentioned in the chapter, it remains at a very general level. Please provide more specific information if possible. If this is lacking, you may want to highlight this as a serious research gap.	We have now included the role of investments in the analysis of the policy instruments in the context of the pathways in section 5.5. However, we were limited in the material we could find in order to answer the question from the scoping document with more specific detail.
Germany	Ch.5	0	0		Many of the key messages in the executive summary identify the problems very thoroughly. However, on possible solutions there is less information available. Some more examples for options even if hypothetical or bound to specific circumstances would be very much appreciated	We have now expanded the "solutions-oriented" text in the Executive Summary explaining what assumptions in scenarios and actions or policy instruments in pathways help to achieve more sustainable futures.
Ben ten brink	Ch.5	0	0	0	Although the chapter is much better structured than the FOD, the Chapter is too long and is mainly a methodological assessment instead of a policy-oriented assessment of B and ES in the ECA region. Therefore and regrettably, after 130 pages it stays unclear to the reader what is the current and future state of B and ES, how much the various drivers contribute to the loss of B and ES, how much the present and future state deviate from the policy targets or has been changed by man, and what are alternative policy options -single measures or smart combinations-, given their effect on B and ES, their efficiency, synergies and trade offs. This information is required to inform policymakers on alternative policies, the ultimate goal of this chapter. The lack of this information also hampers the assessment on how these policies might be effectively achieved in Chapter 6. However, white and grey information on these issues is available and has to be included in the final report, while methodological issues should be taken out, not because they are not sound, but irrelevant for the purpose of this report, and distract from the key insights.	We went through our scoping report and made sure to have addressed the knowledge needs formulated there. We have considerably shortened the chapter and introduced the SDGs and ABTs as policy goals as a guiding concept. We analyse and provide indepth information about which pathways and associated policy instruments will be suitable to achieve goals similar to SDGs and ABTs. We have also closely collaborated with Chapter 6 to ensure that the chapters are well connected.
Ben ten brink	Ch.5	0	0	0	The language is extremely scientific, full of jargon, and quite tiresome to read, and therefore incomprehensible to the target-audience.	We have now revised the entire text and hope the text is now more accessible.

Ben ten brink	Ch.5	0	0	0	0	The chapter is extremely information dense, leaving the reader lost in the forest by the trees; 'data rich but information poor'. The 'synthesis' of the many data and knowledge is lacking, the key function of the ECA. In this stage of the work this is not uncommon. In the final stage up to the FOD this step can be made by selection of the major issues, policy focus and synthesizing, extracting the big picture for the target-audience answering the 4 key policy questions: what is changing, why, why is it important and what can we do about it? Given the information gaps in the SOD, this will take quite an additional effort.	We went through our scoping report and made sure to have addressed the knowledge needs formulated there. We have considerably shortened the chapter and introduced the SDGs and ABTs as policy goals as guiding concept. We analyse and provide indepth information about which pathways and associated policy instruments will be suitable to achieve goals similar to SDGs and ABTs. Concerning the 4 key policy questions, we start in section 5.2 on why things change, and provide in section 5.3 what are the results of these changes and how the changes bring us closer to policy goals and targets similar to SDGs and ABTs or not. Finally in sections 5.4 and 5.5 we provide intensive detail about pathways to a more sustainable future.
Ben ten brink	Ch.5	0	0	0	0	It would be informative if answers could be given on ongoing discussions whether intensification or extensification of food (and fibre) production is favorable to B and ES? ; how to include foot prints outside the study area in such analysis?; are biofuels for climate mitigation beneficial or detrimental?; are forest plantations, clear cut or multifunctional forests beneficial to B and ES? ; what is the impact of conservation areas?; can their impact be increased in combination with sector policies?; what is the impact of different spatial alternatives of conservation in the ECA region?; what are the pros and cons of wild capture fisheries and aqua culture?; what is the impact of more or less meat consumption? ; what are alternatives for meat consumption?; how to judge large scale soy production in this respect?; are free trade policies in food positive or negative to B and ES in ECA?; and what are the trade offs in other world regions? ; what is the relative contribution of population growth, consumption and technology improvements such as efficiency of the use of water, energy, materials, and space?; is their cumulative impact additive or multiplicative?; and can we roughly rank policy options in terms of effectiveness and efficiency, and which trade offs and synergies have to be taken into account when implementing them in combination? Without answers on these kinds of questions and indications on which pathway(s) sectors can take in support of B and ES it remains unclear what to do, and policies stay toothless.	The questions highlighted in the comment are certainly very relevant. However, they are a selection of questions. As pointed out above, we have addressed the policy questions and issues that were laid out in the scoping report. When synthesising the findings from the reviews, we have attempted to pull out many of the issues mentioned from the modelling studies and the pathway narratives, but we are limited by the information available from the literature reviews. Also definitive answers to this questions are not possible. However, we do raise the issues that they entail, particularly focusing on trade-offs (cross-sector and cross-scale/inter-regional). We provide examples of such trade-offs related to intensification vs extensification, biofuels, forests vs agricultural land use, dietary change, etc. We also provide indications of how such trade-offs may be resolved depending on assumptions about drivers (such as population growth, consumption, technology, etc) in the different scenario archetypes.
Ben ten brink	Ch.5	0	0	0	0	Reports that assess the impacts of single measures and measure packages on B and ES, trade offs and synergies, an regional distribution are: 'CBD/MNP (2007), Cross-roads of Life on Earth; Exploring means to meet the 2010 biodiversity target. Solution oriented scenarios for the Global Biodiversity Outlook 2. CBD Technical Series No. 31. /MNP report 555050001. Secretariat of the Convention on Biological Diversity and Netherlands Environmental Assessment Agency, Montreal en Bilthoven'; 'PBL (2010). Rethinking Global Biodiversity Strategies: Exploring structural changes in production and consumption to reduce biodiversity loss. Netherlands Environmental Assessment Agency (PBL), The Hague/Bilthoven'; 'PBL (2014) How sectors can contribute to sustainable use and conservation of biodiversity. CDB Technical Series No 79'; 'UNCCD (2017) Global Land Outlook. (forthcoming)'; 'PBL (2017). Exploring the impact of changes in land use and land condition on food, water, climate change mitigation and biodiversity; Scenarios for the UNCCD Global Land Outlook. PBL-Netherlands Environmental Assessment Agency. Report xx. The Hague' (forthcoming); 'Land Degradation and Restoration Assessment, second order draft. IPBES (Forthcoming)'; 'Burney, J. A., Davis, S. J., & Lobell, D. B. (2010). Greenhouse gas mitigation by agricultural intensification. <i>Pnas</i> , 107(26)'; 'Alkemade, R., van Oorschot, M., Miles, L., Nelleman, C., Bakkenes, M., & ten Brink, B. (2009). GLOBIOS3: A Framework to Investigate Options for Reducing Global Terrestrial Biodiversity Loss. <i>Ecosystems</i> , 12(3)'.	Thank you for the suggestions. We have included them where they met our review criteria.
Ben ten brink	Ch.5	0	0	0	0	As liaison between Chapter 5 and 6 of the ECA I am happy to support the making of the synthesis over the large amount of information	Thank you very much for your offer. We have discussed ways forward during the authors meeting in Prague and had a close exchange between the chapters, particularly on pathways and policy instruments presented in chapter 5. These are now picked up and further detailed in chapter 6 to provide concrete policy options for the different pathways.
Henk van Zeijts	Ch.5	0	0			The chapter is impressive in terms of material, but way too long for its target group. Sections 5.2 and 5.3 could be much shorter, as these are general and exploratory scenarios, and could focus more on the trends that are most important for biodiversity and ncp's. Section 5.5 is the most interesting part of the Chapter, can be elaborated not shortened.	We have now considerably shortened sections 5.2 and 5.3 and elaborated on the pathways and associated policy instruments to futher improve the relevance of the chapter
Olesya Petrovych	Ch.5	0	0			Chapter 5 about scenarios is interesting. But it seems that the text often repeats, because there are a lot of recurrent moments or possible synergic approaches to different scenarios and decisions that have already been made. That's why I think that the document can be shortened and made more accessible to reader.	We have now considerably shortened sections 5.2 and 5.3 and elaborated on the pathways and associated policy instruments to futher improve the relevance of the chapter
Andrew Wade	Ch.5	0	0			Congratulations to all the authors and review editors on excellent work to collate and present the material. The chapter is impressive.	Thank you!
Andrew Wade	Ch.5	0	0			The material presented seems to draw heavily from a few key modelling studies and whilst this may represent the state of the art, perhaps caveats need to be added to acknowledge the limitations of the approach too? In particular, integrated models operate at a large scale and landscape heterogeneity and local factors may mean the generalised results are not applicable at smaller scales.	The limited number of papers from integrated models has been emphasised in the description of the review in Section 5.3 and again in the synthesis of the results as relevant. We have also added a box on integrated assessment models and uncertainties to highlight some of the limitations and uncertainties associated with such approaches (Box 5.4)
Andrew Wade	Ch.5	0	0			Given the phrasing used throughout the chapter it appears that the published work considered has been taken as fact. It is unclear how robust all the different studies are and how strong the evidence is for the outcomes noted. For example are some of the conclusion based on a single study or a synthesis of multiple studies?	We have attempted to make the number of studies and number of indicator-scenario combinations underlying the results clearer. If results are based on a single study, this has been indicated. We have also reviewed the language to ensure we talk about "projected changes", so that the results are not taken as fact. We also highlight uncertainties in several places (early in Section 5.3, in Box 5.4, throughout the results where relevant and in Section 5.6)
The Netherlands: Astrid Hilgers	Ch.5	0	0	0	0	This chapter gives an extensive overview of scenarios and model applications. However, an important set of recently developed, and still applied, RCP scenarios is missing. The chapter is very theoretic dealing with models and scenario approaches. Also, various trade-offs deserve more attention. It is recommended that the chapter builds on the relationships between drivers and impacts that have been identified in chapter 4.	The RCPs are included in the review of scenarios, often interpreted in terms of outputs from climate models. We have revised the chapter to make it less theoretical and emphasise the policy-relevant results in relation to goals and targets similar to the SDGs and Aichi biodiversity targets. Trade-offs are discussed in detail in Sections 5.3, 5.4 and 5.5. They are also summarised in Section 5.6 and the Executive Summary. Links with Chapter 4 have been improved.

The Netherlands: Astrid Hilgers	Ch.5	0	0	0	0	Although the chapter is much better structured than the FOD, the Chapter is too long and is mainly a methodological and 'meta' assessment instead of an assessment of biodiversity and ES in the ECA region. Especially section 5.2 and 5.3 could be much shorter; it is section 5.5 that is the most relevant. After reading the chapter, it stays unclear what is the current and future state of B and ES, how much the various drivers contribute to the loss of B and ES, how much the present and future state differ from the policy targets, what are alternative policy options (single measures or combinations) to a BAU scenario and what are the consequences for B and ES. This information is required to inform policymakers on alternative policies, the goal of this chapter. The lack of this information also hampers the assessment on how these policies might be effectively achieved in Chapter 6. More information on these issues is available and should be included, while methodological issues can be taken out.	The reorganisation of the chapter following the guidelines has been undertaken. This has lead to a significant reduction of sections 5.2 and 5.3 with some of the original, rather methodological information deleted. A more policy-relevant focus on results has been taken throughout the chapter. The link to chapter 6 has also been improved so that the results on pathways and policy instruments presented in chapter 5 are now picked up and further detailed in chapter 6 to provide concrete policy options for the different pathways.
The Netherlands: Astrid Hilgers	Ch.5	0	0	0	0	The scenarios discussed in this chapter are more globally applicable then specifically suited for the ECA region.	We have now considerably reduced the material on the global scale and focus on ECA specific studies. We only left global information where it was useful to analyse cross-scale interactions as requested in the scoping document.
The Netherlands: Astrid Hilgers	Ch.5	0	0	0	0	The chapter is extremely information dense, leaving the reader lost. An example of data rich but information poor. As such this is a common stage in such analysis. The next step towards the FOD is to rise out of the many details and extract the big picture for the target-audience to answer the 4 key policy questions: what is changing, why, why is it important and what can he do about it?	We went through our scoping report and made sure to have addressed the knowledge needs formulated there. We have considerably shortened the chapter and introduced the SDGs and ABTs as policy goals as guiding concept. We analyse and provide indepth information about which pathways and associated policy instruments will be suitable to achieve goals similar to SDGs and ABTs. Concerning the 4 key policy questions, we start in section 5.2 on why things change, and provide in section 5.3 what are the results of these changes and how the changes bring us closer to policy goals and targets similar to SDGs and ABTs or not. Finally in sections 5.4 and 5.5 we provide intensive detail about pathways to a more sustainable future.
ECA values liaison group	Ch.5	0	0			When applicable, i.e. when different value types are mentioned or discussed, please refer to the values table and definitions in Chapter 1 that introduces and defines all value types in the assessment. This will be suggested to each ECA chapter	The values table of Chapter 1 was reviewed and compared with all indicators used in Chapter 5 for different values. Finally we standardised all values indicators using Chapter 1 definitions.
ECA values liaison group	Ch.5	0	0			For clarity and consistency, replace "multiple values" with "diverse values" throughout (for example lines 710, 713, 785, etc.	The entire chapters was thoroughly revised and language edited. We hope that we have managed to keep language consistent and clear.
ECA values liaison group	Ch.5	0	0			Add a paragraph in in Sections 5.4.1, 5.4.2, 5.5.1, 5.5.2, (Scenarios, Model, Visions and Pathways) which valuation approaches with the aim of a more coherent, integrated and well-structures treatment of valuation (and only values).	We add in each section (Scenarios, Models and Pathways) a specific analysis of the different values and methods used. To conduct those analysis we developed a systematic review of all references used in each of those section with the aim to understand what type of values, indicators, methods, etc were used.
ECA values liaison group	Ch.5	0	0			General: Add a new sections with the results from the analysis how scenarios, models, pathways and vision incorporated values.	We have considered your suggestion carefully, but finally decided that the value analysis for Chapter 5 was a transversal issue throughout all the sections. A specific section describing the how the values were used in the literature was not necessary, but gaps have been pulled together in Section 5.6.2.
ECA values liaison group	Ch.5	0	0			Check that all subregions are covered roughly equally in terms of values.	All literature from the scenarios, models and pathways reviews was assessed in terms of values. The representation of the subregions was therefore dependent on the literature that was available in each of the reviews.
Mark Snethlage	Ch.5	0	0			In this table, suggestions are made for maps to illustrate some sections of the different chapters. A document with a number of examples (referred to below) is available at:  <a href="https://tinyurl.com/ECA-Maps">https://tinyurl.com/ECA-Maps</a>  ECA sharepoint site login required	An special effort has been devoted to rethink the figures. Also new figures containing maps have been added to the new version of the chapter.
ECA values liaison group	Ch.5	0	0			Please double check the use of the term 'worldview' to ensure it is used consistently, and consistently with IPBES wording and meaning, or at least it is clear from the context what exactly is meant.	We have carefully reviewed the terminology of Values used in Chapter 5. We have omitted some sections which used the term "worldview", so we believe it is now used consistently only where necessary.
PESC-4: Zoi Konstantinou	Ch.5	0	0	0	0	in general text that is too global can be reduced	We have now considerably reduced the material on the global scale and focus on ECA specific studies. We only left global information where it was useful to analyse cross-scale interactions as requested in the scoping document.
PESC-4: Kristina Kujundzic	Ch.5	0	0	0	0	specific scenario work (integrated or exploratory): 2 national ones can be added: one on Montenegro and one Macedonia. See "Integrating Ecosystem Services into Development Planning. Report of the ESAV Regional Resource Persons First Regional Training on Ecosystem Services Assessment and Valuation."	Thank you very much for making us aware of this document. We considered it carefully, for including it in our review, but decided to not include it as it did not meet our review criteria.
PESC-4: Arevik Mkrtchyan	Ch.5	0	0	0	0	This chapter could be complemented with a vision developed for watershed management in the Caucasus (Armenia). See: Vahagn Tonoyan. Protocol on Water and Health – Improving health in Armenia through target setting to ensure sustainable water management, access to safe water and adequate sanitation. Yerevan, June 2014	Thank you very much for making us aware of this document. We considered it carefully, for including it in our review, but decided to not include it as it did not meet our review criteria.

PESC-4: Jeroen Arends	Ch.5	0	0	0	0	The Balkan region is prone to a number of natural disasters ranging from earth quakes, erosion, land slides, drought, floods, forest fires, etc. The last few years have seen an increase of these, especially floods, drought, forest fires and extreme weather events. The region has always historically been prone to these but their increase is attributed to climate change in combination with bad practices such as illegal buildings/settlements as well as lack of institutional capacity and resources to combat the effects. It is expected that number, intensity and duration of these disaster events is likely to increase in the near future due to climate change. This will also affect biodiversity and ecosystem services, especially when considering that sectors of society will also compete with each other for certain ES such water. Links: <a href="http://www.unisdr.org/">http://www.unisdr.org/</a> <a href="http://www.cadri.net/">http://www.cadri.net/</a> <a href="http://www.preventionweb.net/">http://www.preventionweb.net/</a> The UN adopted the Hyogo Framework for Action in order to deal with disasters worldwide. At these site you can find documents related to countries in the region's developments regarding adopting and implementing Hyogo and disaster risk reduction and management. In that respect it is perhaps also interesting to know that there is something called eco-drr which looks at natural solutions to reduce the risk of natural disaster such as wetland restoration, etc. One document that assesses the risk of South Eastern Europe is "South Eastern Europe Disaster Risk Mitigation and Adaptation Initiative Risk Assessment for South Eastern Europe Desk Study Review" by UN/ISDR and World Bank although newer risk assessments exist.	Thank you very much for making us aware of this document. We considered it carefully, for including it in our review, but decided to not include it as it did not meet our review criteria.
Henk van Zeijts	Ch.5	1	89	1	90	This conclusion does not seem to fit with the goal of exploratory scenarios; skip the policy choices part. Alternative: 'Wide ranging future impacts have been projected on ...'	Exploratory scenarios include different assumptions about governance, policy and cultural drivers (as well as other indirect and direct drivers). The conclusion comes from assessing the impacts under these different driver assumptions. We prefer to keep this opening sentence as it is more policy-relevant than the one proposed. However, we have added an additional sentence in bold to further explain this.
The Netherlands: Astrid Hilgers	Ch.5	1	89	1	90	This conclusion does not seem to fit with the goal of exploratory scenarios; skip the policy choices part. Alternative: Wide ranging future impacts have been projected on ...	Exploratory scenarios include different assumptions about governance, policy and cultural drivers (as well as other indirect and direct drivers). The conclusion comes from assessing the impacts under these different driver assumptions. We prefer to keep this opening sentence as it is more policy-relevant than the one proposed. However, we have added an additional sentence in bold to further explain this.
Mark Rounsevell	Ch.5	4	76			There doesn't seem to be much about models, and especially model uncertainty in the Exec Sum. Given the importance of model type in determining scenario outcomes, perhaps this should be addressed somewhere? One could also argue that the lack of integrated models for use in cross-sectoral and multi-driver studies is a knowledge gap, given the focus here on complexity.	At least half of the Key Messages describe results from models. They have not been phrased in this way (other than using the term "projected" to ensure they are not taken as fact) to make them more policy-relevant and accessible. We have added the term "scenario and modelling studies" to the opening Key Message to make this clear. The lack of integrated models and uncertainty is included in the final Key Message.
Markus Fischer	Ch.5	4	76			Many statements in the non-bold texts (and also some in the bold texts) need to be flagged with confidence language.	We have confidence language throughout all Key Messages.
Ben ten brink	Ch.5	4	76	8	255	The results and insights in the Executive Summary are extremely hard to perceive for its abstract terms and sentences, and expression in relative changes ('increase', 'decrease', 'deterioration', ...) in a wide variety of issues, which does not give any idea or specification about the absolute state of a particular issue (B, ESs or other), its rate, a sense of severity by comparing it with a meaningful baseline or reference value, to whom it may be detrimental or beneficial, where and when. It is also unlikely that such statements, even specified, would apply to the entire ECA region, as it is unlikely that statements on improvement or deterioration apply to all 'nature', 'NCP', 'good quality of life', considering these cover many aspects often changing in opposite directions, and the socioeconomic and ecological diversity of the ECA region. The trade offs are not only between nature, ES and hard socioeconomic interests, but also between the components within nature, ES and socioeconomic interests. Also it is difficult to interpret the scenarios, how and why they differ. Where are they standing for, does it concern autonomous developments or impacts from -changeable- policies, and if so, which concrete policies they include, where and when? To summarize, this executive summary does not deliver the information to support policymakers. Specification is required. When the Chapter answers the four key policy questions mentioned above it achieves its goal. This is the challenge for the final draft.	We went through our scoping report and have made sure we have addressed the key policy questions. We have also revised the Executive Summary to be more specific and to include Key Messages on the scenarios (and their interpretation), trade-offs between sectors/nature/NCP/quality of life indicators and geographical variations in impacts.
The Netherlands: Astrid Hilgers	Ch.5	4	76	8	255	The results and insights in the Executive Summary are extremely hard to perceive for its abstract terms and sentences, and expression in relative changes in a wide variety of issues, which does not give any idea or specification about the absolute state of a particular issue (B, ESs or other), its severity, to whom, where and when, to the target-audience. It is also unlikely that such statements, even specified, would apply to the entire ECA region, as it is unlikely that statements on improvement or deterioration apply to all 'nature', 'NCP', 'good quality of life', considering these cover many aspects often changing in opposite directions. The trade offs are not only between nature, ES and hard socioeconomic interests, but also between the components within them. Also it is difficult to interpret the scenarios and how they differ. Where are they standing for, are they autonomous developments or do they include concrete policy measures, and if so, which concrete policies they include, where and when? To summarize, this executive summary does not deliver the information to support policymakers. Specification is required. When the Chapter makes clear to the policymaker: 'what is changing, from which causes, why it is important, and what can we do about it?' it becomes useful information. This is the challenge for the final draft.	We went through our scoping report and have made sure we have addressed the key policy questions. We have also revised the Executive Summary to be more specific and to include Key Messages on the scenarios (and their interpretation), trade-offs between sectors/nature/NCP/quality of life indicators and geographical variations in impacts.
Markus Fischer	Ch.5	4	77			Integrated assessment of what exactly?	Rephrased. The focus is now on integrated scenario and modelling studies and how they help to assess impacts on nature, NCP and quality of life indicators for informing pathways to sustainable futures.
The Netherlands: Astrid Hilgers	Ch.5	4	77	4	88	Hard to read; many concepts need to be more explicitly defined. Also, elaborate. Suggestion to alter/remove statement 1.	We have rephrased this first Key Message and focus on the priorities for sustainable development within the ECA region
PESC-4: Machteld Schoonenberg	Ch.5	4	77	4	80	rephrase the first key message in the executive summary	We have rephrased this first Key Message and focus on the priorities for sustainable development within the ECA region
The Netherlands: Astrid Hilgers	Ch.5	4	89	4	111	The summary could start with this paragraph instead of the above. However, it still misses how this affects ECA specifically.	We rephrased the first Key Message to make it more policy-relevant. Geographical variations in impacts across the ECA region are provided in the 4th Key Message
Markus Fischer	Ch.5	4	91			"...four plausible future scenario archetypes...": With business as usual it would be five. As this is the first mention of the archetypes, it would be good to also mention the latter.	We have decided to avoid using the term scenario archetypes in the Executive Summary to avoid confusion. The Key Message has been expanded to include all 6 scenario archetypes discussed in the chapter
Germany	Ch.5	4	91	4	91	Some of the choices can be captured in the four scenarios, but not all choices - as stated in the text	Rephrased to omit this part of the sentence
Mark Rounsevell	Ch.5	4	92			Do you need to say 'scenario archetype' throughout?	We have decided to avoid using the term scenario archetypes in the Executive Summary to avoid confusion.
Markus Fischer	Ch.5	4	99	4	100	Somewhat surprising at first glance, may give idea why this is so	Rephrased to explain each scenario archetype independently
PESC-4: Agnes Hallosserie	Ch.5	4	101	4	101	the term 'regional' in this context is confusing. Can you think of another term for this scenario hypothesis.	This is the term used in the IPBES Deliverable 3c, so it can not be changed.

ECA values liaison group	Ch.5	4	106		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	"wellbeing" has been changed throughout where appropriate to align with the IPBES CF
ECA values liaison group	Ch.5	4	111		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	"wellbeing" has been changed throughout where appropriate to align with the IPBES CF
The Netherlands: Astrid Hilgers	Ch.5	4	115	5	119 Stating the obvious a bit. Please explain, why and when this statement is valid.	These are the trade-offs we found in the literature. We don't agree that they are obvious to everyone and are a key trade-off associated with these scenarios
Andrew Wade	Ch.5	4	123	4	126 Whilst evidence does suggest that afforestation with high intensity plantation forest (e.g. Plynlimon) can increase evapotranspiration and reduce surface flows during forest growth (Marc and Robinson, 2007) then it is unclear that reforestation will reduce water resources on the scale suggested to adversely impact ecosystem health given likely variability in forest age and structure and, possibly, precipitation - though this may depend on the location and climate regime. The term reforestation implies a return to a previous state when the surface water resources, presumably, supported a more natural ecosystem (perhaps afforestation is meant? - which is more in keeping with the citation of Schroter et al., 2005 in the cross-referenced sections). The studies used to provide the evidence for the statement about reduced surface water resources need to be looked at carefully, it may be that additional water is moving to groundwater during storms which may offset any increase in ET in terms of surface water depletion, or that changes in precipitation and snowmelt may be driving the overall water balance. Care is needed here if this outcome is based on one hydrological model and highlights the need to be cautious in the interpretation of modelled outcomes. I re-read the Schroter et al (2005) paper to look at the supporting evidence for this statement about the water balance as this is the paper cited in the supporting paragraphs. This paper doesn't mention reafforestation, it does mention afforestation but doesn't detail the effect on the water balance in the main text. The supplementary material is no longer available for access from the publishers website using the URL given in the paper. Marc V and Robinson M (2007) The long-term water balance (1972-2004) of upland forestry and grassland at Plynlimon, mid-Wales. Hydrology and Earth System Sciences 11(1), 44-60.	Thank you for this information. We have carefully assessed the literature and changed the wording of this "trade-off" in the chapter (section 5.3) and omitted it from the Executive Summary (where we focus on less controversial trade-offs such as the effects of agricultural extensification or increases in bioenergy croplands on other land uses and biodiversity)
Henk van Zeijts	Ch.5	5	122	5	122 One cannot say trade-offs are 'more prominent' on the economically-focussed futures. People who focus on provisioning services will not agree. How is 'prominent' defined?	Reworded to emphasise that trade-offs exist under all the scenarios
The Netherlands: Astrid Hilgers	Ch.5	5	122	5	122 One cannot say trade-offs are 'more prominent' on the economically-focussed futures. People who focus on provisioning services will not agree. How is 'prominent' defined?	Reworded to emphasise that trade-offs exist under all the scenarios
Mark Rounsevell	Ch.5	5	124	5	125 Not sure about this. There is a lot of literature in the climate field that demonstrates that re/afforestation increases precipitation and reduces temperatures (i.e. evapotranspiration)  A more important negative effect of reforestation is the potential loss of biodiversity.	We have changed the wording of this "trade-off" in the chapter (section 5.3) and omitted it from the Executive Summary (where we focus on less controversial trade-offs such as the effects of agricultural extensification or increases in bioenergy croplands on other land uses and biodiversity)
Markus Fischer	Ch.5	5	124	5	125 Effect of reforestation on BD would be mixed, with increases for some taxa and declines for others.	We have changed the wording of this "trade-off" in the chapter (section 5.3) and omitted it from the Executive Summary (where we focus on less controversial trade-offs such as the effects of agricultural extensification or increases in bioenergy croplands on other land uses and biodiversity)
Tanya Lazarova	Ch.5	5	131	5	132 This sentence is repeating the one on line 112-113, p.4	Reworded to emphasise geographic differences in impacts
The Netherlands: Astrid Hilgers	Ch.5	5	131	5	132 Repetition of previous statements in a way. Suggest to merge and/or cut.	Reworded to emphasise geographic differences in impacts
Henk van Zeijts	Ch.5	5	132	5	134 Scenarios ... are effective' change into 'Cooperation between countries open up possibilities to ...'	Thank you for the suggestion. We have reworded this sentence as you suggest.
The Netherlands: Astrid Hilgers	Ch.5	5	132	5	134 Scenarios ... are effective' change into 'Cooperation between countries open up possibilities to ...'	Thank you for the suggestion. We have reworded this sentence as you suggest.
Andrew Wade	Ch.5	5	141	5	144 May also be appropriate to note that climate change may/may not have a confounding influence on the mitigation measures used to reduce water pollution. For example: Whitehead et al 2013. Water security, water quality and aquatic ecology - a cost-effectiveness analysis: impacts of climate and land use change on the River Thames system. Philosophical Transactions of the Royal Society. <a href="http://dx.doi.org/10.1098/rsta.2012.0413">http://dx.doi.org/10.1098/rsta.2012.0413</a> ; Crossman et al. (2013) The interactive responses of water quality and hydrology to changes in multiple stressors, and implications for the long-term effective management of phosphorus. Science of the Total Environment 454-455, 230-244.	Thank you for the reference, which we have considered. The sentences in the executive summary to which this comment referred have now been omitted in the process of shortening the key messages
The Netherlands: Astrid Hilgers	Ch.5	5	142	5	144 leave out "such as..." as it is addressed in other chapter and too much info for this place.	Omitted
Markus Fischer	Ch.5	5	157		Say clearly to which visions you refer, i.e. how visions are defined.	We have now revised the key messages to make results concerning visions more clear. We also integrated a definition of visions into the first key message
Hanna Skryhan	Ch.5	6	169	6	177 to make separate paragraph	We have now revised the entire key messages. The most important point of the visions are now captured in key message 1
PESC-4: Agnes Hallosserie	Ch.5	6	172	6	177 make a separated paragraph in bold on the importance of cross-sectoral approach to mainstream biodiversity	We have now made more clear the point in a second key message on pathways
Germany	Ch.5	6	178	6	182 Awareness of multiple pathways will certainly contribute to reducing the likelihood of potential mal-adaptations. However, it is not a means to avoid path dependencies per se.	We have rephrased the key message and deleted the reference to path dependencies
PESC-4: Zoi Konstantinou	Ch.5	6	196	6	196 in general the para is very well written but term 'Eco-topian' might not be appropriate. It gives the impression that it will never happen.	Our narratives are adopted from a key publication (Luderitz et al.), and we chose to stick with the approach described therein.
Mark Rounsevell	Ch.5	6	205		Too prescriptive	We have rephrased the key message.
Hanna Skryhan	Ch.5	7	207	7	209 add the 'positive' statement as an advice or recommendation for policy-makers	We are not permitted to be prescriptive. The key message highlights clear gaps in knowledge that policy-makers/funders can fill
PESC-4: Hanna Skryhan	Ch.5	7	207	7	234 maybe pertinent to inverse para starting on line 207 and the one starting on line 221	The key messages have been restructured to provide a more logical order and flow
PESC-4: Hanna Skryhan	Ch.5	7	207	7	220 rephrase and elaborate on participatory approaches . Provide the solution already	We were advised to avoid to many methodological details. Therefore we decided to keep the key message rather short. We include the importance of participatory approaches and ILK in a separate key message
PESC-4: Machteld Schoolenberg	Ch.5	7	207	7	220 lack of links to local level (ECA) and express the differences in the region. The current paragraph is too global.	This conclusion applies to all 4 subregions. In the final key message and in Section 5.6.2 we also provide information on the lack of integrated studies in Central Asia and to a lesser extent Eastern Europe to provide some ECA-specific detail

Tanya Lazarova	Ch.5	7	212	7	213	Here , to be more concrete, you can say that most scenario studies focus on single DIRECT drivers, as later in figure 5.7, we see that there are quite a lot of studies which use sets of indirect drivers	Thank you. We have made the suggested change
Germany	Ch.5	7	221	7	221	Message explained later in the chapter, the difference/definition of scenario vs. pathways studies might need to be included here. Otherwise it might be difficult to understand this key message	We have rephrased the start of the key message in terms of pathways ADDRESSING trade-offs to clarify the difference with scenarios. We prefer not to put definitions in the executive summary
ECA values liaison group	Ch.5	7	221			Add in the key message of values a sentence with the main idea coming from the comparative analysis how scenarios, models, pathways and vision incorporate values	This key message has been omitted and information on values integrated across the other key messages on scenarios and pathways
Hanna Skryhan	Ch.5	7	221	7	222	re-formulate + add the 'positive' statement as an advice or recommendation for policy-makers	This key message has been omitted and information on values integrated across the other key messages on scenarios and pathways
PESC-4: Hanna Skryhan	Ch.5	7	221	7	234	similarly turn it into a positive sentence with participatory approach	This key message has been omitted and information on values integrated across the other key messages on scenarios and pathways
Henk van Zeijts	Ch.5	7	230	7	232	Links people-hierarchist, planet-egalitarian, individualist-profit seem simplistic and not well-established.	We have now omitted with text and key message
The Netherlands: Astrid Hilgers	Ch.5	7	230	7	232	Links people-hierarchist, planet-egalitarian, individualist-profit seem simplistic and not well-established.	We have now omitted with text and key message
PESC-4: Hanna Skryhan	Ch.5	7	235	7	243	good paragraph	Thank you
Tanya Lazarova	Ch.5	7	236			Can you put the full names instead of the acronyms ILKP and ILKC here?	In line with newest guidance from IPBES we are now avoiding these acronyms altogether.
PESC-4: Agnes Hallosserie	Ch.5	7	236	7	236	confusion on ILKC and ILKP acronyms and their use. We do not understand the meaning of the sentence. Check with the TSU...	In line with newest guidance from IPBES we are now avoiding these acronyms altogether.
Hanna Skryhan	Ch.5	7	244	7	246	add the 'positive' statement as an advice or recommendation for policy-makers	We were advised to provide a key message on gaps and uncertainties.
PESC-4: Arevik Mkrtchyan	Ch.5	7	244	8	255	rephrase the para. List the gaps in certain geographical areas and put emphasis on what needs to be done to fill in these gaps (but must not be prescriptive).	We have now tried to revise the key message according to your recommendation.
ECA values liaison group	Ch.5	7	245			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Done
Mark Rounsevell	Ch.5	8	255			Insert sub-section reference?	Added
Hanna Skryhan	Ch.5	8	256	8	256	add the conclusions on the importance of the educations, sharing the best practices and etc.	This is emphasised for the ecotopian and transition movements pathways in terms of continuous education and knowledge sharing.
Mark Rounsevell	Ch.5	9	276			You've explained more about what scenarios are and the different types (below), so do you also need to do the same for models? There is a large range of model types, including 'mental models' and we know (from the literature) that the model type is a strong factor in determining scenario outcomes. So perhaps a brief introduction would be useful here?	We explained the scenarios in more detail to provide an explanation for our overall chapter structure. In order to keep the introduction as short as possible and avoid methodological discussions, we refrained here from adding more explanation about models. The introduction to the different models is provided in section 5.3.1 and specifically in Box 5.4
Mark Rounsevell	Ch.5	9	283			You might find this article useful in defining the differences between scenario types, and a bit of 'history' of the scenario method:  Rounsevell, M.D.A. and Metzger, M.J. (2010). Developing qualitative scenario storylines for environmental change assessment. Wiley Interdisciplinary Reviews Climate Change, 1, 606-619	Reference added, but in order to avoid too much methodological discussion we did not include further information on differences between scenarios types or its history.
Tanya Lazarova	Ch.5	10	297			To make it easier for the graphic designers, you can just crop the upper part of Figure SPM.2 of the Summary for Policymakers of Del.3c, which shows exactly what you show in Figure 5.1	Thank you very much for the suggestion.
Jean-Paul Hettelingh	Ch.5	11	325			The entities distinguished in Fig. 5.2. are not made operational with what the reader learned in chapter 4.	We have now included the connections our chapter has with the other chapters, to make the scope of the individual chapters clearer.
The Netherlands: Astrid Hilgers	Ch.5	11	325	11	325	The entities distinguished in Fig. 5.2. are not made operational with what the reader learned in chapter 4.	We have now included the connections our chapter has with the other chapters, to make the scope of the individual chapters clearer.
Markus Fischer	Ch.5	11	326			In the box below visions are defined. A short definition would be needed also in exec summ when visions are first mentioned.	We have now included a definition in the key messages
ECA values liaison group	Ch.5	11	327			In box 5.1, please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	We have made the suggested change.
Ben ten brink	Ch.5	12	330	38	1069	this section is highly methodological oriented and would be more suitable as supplementary information in an Annex. The conclusions can be added in a chapter on information gaps and recommendations on future work	The section has been substantially refined to omit unnecessary methodological detail, to move necessary methodological detail into boxes and to focus the main text on the resulting insights in the form of scenario archetypes for Europe and Central Asia.
The Netherlands: Astrid Hilgers	Ch.5	12	330	38	1069	This section is highly methodological oriented and would be more suitable as supplementary information in an Annex.	The section has been substantially refined to omit unnecessary methodological detail, to move necessary methodological detail into boxes and to focus the main text on the resulting insights in the form of scenario archetypes for Europe and Central Asia.
ECA values liaison group	Ch.5	14	378			Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Done
Markus Fischer	Ch.5	14	390			Brackets often in wrong place	Mendeley issue that can not be resolved
PESC-4: Zoi Konstantinou	Ch.5	14	400	14	402	Table 5.1 might be confusing. The text is clearer. Thus the table should be moved to the annex	The table has been moved to a box and is no longer part of the main text.
Tanya Lazarova	Ch.5	15	421	15	422	Please double check this with the other Chapter 5s. I noticed that the Asia Pacific and Americas assessments used the Hunet et al. archetypes.	There was an agreement across chapter 5s in the Japan workshop to use the archetypes provided in IPBES deliverable 3C. We have used these archetypes and hope that the other assessments will also follow the agreed approach.
The Netherlands: Astrid Hilgers	Ch.5	17	485	17	485	Table 5.2: Need for classification on what these arrows mean. The table should include social aspects as well.	The table has been omitted in the current version of the chapter.
Hanna Skryhan	Ch.5	17	485	17	47	Add the column "Social aspects" and description of the arrow directions	The table has been omitted in the current version of the chapter.

PESC-4: Hanna Skryhan	Ch.5	17	485	17	487	table 5.2 is too hard to understand. Social issues are missing in the table but they are at the background.	The table has been omitted in the current version of the chapter.
Christian Schleyer	Ch.5	17	488			Please consider Priess, J.A. and J. Hauck (2014): Integrative scenario development. <i>Ecology and Society</i> 19: [online]: <a href="http://www.ecologyandsociety.org/vol19/iss1/art12/">http://www.ecologyandsociety.org/vol19/iss1/art12/</a> as well as Priess et al. (forthcoming) for an excellent example of EU level scenarios with compelling narratives for ecosystem services provisioning and natural capital -> Priess, J.A., Hauck, J., Haines-Young, R., Alkemade, R., Mandryk, M., Veerkamp, C., Gyorgyi, B., Dunford, R., Harrison, P., Dick, J., Keune, H., Kok, M., Kopperoinen, L., Lazarova, T., Maes, J., Pataki, G., Preda, E., Schleyer, C., Vadineanu, A. & Julian, G. (forthcoming): Lookout on Europe's ecosystem services and natural capital: new EU-level scenarios until 2050. <i>Ecosystem Services</i> .	Thanks for valuable suggestions. We have included the OpenNESS scenarios described in the Priess et al. paper. Unfortunately, the first article does not match our review criteria as it is sub-national level.
Mark Rounsevell	Ch.5	17	495	17	496	There are a lot of useful sub-national scenario studies that should be assessed here. I've given some examples below that I'm aware of, but I'm sure there are many more studies. It would be especially interesting to see how the outcomes/conclusions of the sub-national scenario studies compare with the national to continental scale scenarios.	Thanks for a relevant comment. Unfortunately, covering large numbers of sub-national scale scenario studies was not feasible due to time and capacity constraints. Suggested studies were added to an illustrative box on local scale scenarios.
Hanna Skryhan	Ch.5	17	498	17	503	present text as a figure	Due to space constraints, this paragraph was shortened and rephrased.
Denmark	Ch.5	18	495	18	496	reducing nutrient loads and enhanced fishery management ( <i>well established</i> ).	The comment doesn't match the text on the stated line numbers, so unfortunately, we could not identify the specific text in this paragraph which the comment refers to.
Denmark	Ch.5	18	496	18	496	Then forcing? Unsure what that means	The comment doesn't match the text on the stated line numbers, so unfortunately, we could not identify the specific text in this paragraph which the comment refers to.
Denmark	Ch.5	19	512	19	513	Exceptions from what? Please clarify.	The comment doesn't match the text on the stated line numbers, so unfortunately, we could not identify the specific text in this paragraph which the comment refers to.
Mark Rounsevell	Ch.5	20	522			I'm surprised that 10 is the maximum number of drivers considered. I would have thought that scenarios based on integrated assessment models (both global and regional scales) would include (many?) more than this. For example the CLIMSAVE IAP model (cited here) has been used to generate European scenarios, with 24+ input variables (that equate to different drivers), e.g. see Kebbede et al (2015), Climatic Change, for a list. Perhaps this is because 'driver' is being used here at a more aggregate level, e.g. climate, economy, governance, ... in which case this should be clearly stated.	The latter explanation is the one we had in mind. We now describe this explicitly in the new version of section 5.2.1.
PESC-4: Hanna Skryhan	Ch.5	20	524	24	646	section 5.2.2.2 should be rearranged and shortened. It is hard to understand. Should give clearer conclusions.	Section 5.2.2.2 was rearranged and substantially shortened.
The Netherlands: Astrid Hilgers	Ch.5	21	572	21	586	table 5.7: this table is too complex. Visuals should serve as clarification for the reader. Re-arrange or simplify text and figure.	The figure was rearranged to make it more intuitive to understand.
PESC-4: Machiel Schoolenberg	Ch.5	21	572	21	586	the paragraph above fig 5.7. already covers the content of the table so it could be moved to annexes	The text has been substantially shortened and therefore, the table was kept, but rearranged to become more informative.
Ben ten brink	Ch.5	22	539	22		Recently, an integrated scenario analysis has been executed for UNCCD's first Global Land Outlook based on the scenarios SSP1, 2 and 3, disaggregated for 10 world regions amongst which 'West and Central Europe' and 'Russian region and Central Asia'. This report provides the latest information for the ECA in terms of B and ES in the past, present and future, and thus relevant to include in its assessment. In the GLO a fourth scenario has been analysed on ongoing decline in productivity, land cover and soil properties ('land degradation') and its impacts on food, agricultural area, water scarcity and river discharges, carbon storage, climate change, and biodiversity. The GLO report will be published by the sUNCCD at the COP13 in september this year; The underlying scientific report will be published in the summer of 2017 as 'PBL Netherlands Environmental Assessment Agency (2017). Exploring the impact of changes in land use and land condition on food, water, climate change mitigation and biodiversity; Scenarios for the UNCCD Global Land Outlook. PBL Report. Den Haag.'	Thanks for a highly relevant suggestion. Unfortunately, the time of publishing of the reports does not fit with the IPBES timescale (studies need to be published before May 2017).
UK: Karsten Schonrogge	Ch.5	22	573	22	575	That statement seems to be accurate. For the whole paragraph a suggestion would be to illustrate our well established knowledge of individual drivers, in forestry disease affecting species of major importance at continental scales (Ash dieback, Dutch Elm Disease, Chestnut Blight to name a few), but our lack of understanding about the interaction of drivers, e.g. pathogens and climate change.	The comment doesn't match the text on the stated line numbers, so unfortunately, we could not identify the specific text in this paragraph which the comment refers to.
Mark Rounsevell	Ch.5	22	597			The definitive reference for the ALARM scenarios is:  Spangenberg, et al. (2012). Scenarios for investigating risks to biodiversity. <i>Global Ecology and Biogeography</i> , 21, 5-18  Another study using the ALARM scenarios that also explores impacts on an individual species:  Guillem, E.E., Murray-Rust, D., Robinson, D.T., Barnes, A.P., Rounsevell, M.D.A. (2015). Modelling farmer decision-making to anticipate trade-offs between provisioning ecosystem services and biodiversity. <i>Agricultural Systems</i> , 137, 12–23  And another ALARM study exploring impacts on Natura2000:  Vogiatzakis, I.N., Stirpe, M.T., Rickebusch, S., Metzger, M.J., Xu, G., Rounsevell, M.D.A., Bommarco, R. & Potts, S.G. (2015). Rapid assessment of historic, current and future habitat quality for biodiversity around UK Natura 2000 sites. <i>Environmental Conservation</i> , 42, 31-40 doi:10.1017/S0376892914000137	Thanks for highly relevant suggestions. Some of the citations were included in the text.

Mark Rounsevell	Ch.5	22	613		<p>Another relevant SRES-based study that you might like to add to the list is reported in:</p> <p>Murray-Rust, D., Rieser, V., Robinson, D.T., Milicic, V. and Rounsevell, M.D.A. (2013). Agent-based modelling of land use dynamics and residential quality of life for future scenarios. <i>Environmental Modelling &amp; Software</i> 46, 75-89</p> <p>This study also explores quality of life issues (and land use change) for a location in Central Europe.</p> <p>... and another SRES-based scenario study of land use change and ecological networks:</p> <p>Bakker, M., Jamal Alam, S., van Dijk, J., Rounsevell, M.D.A., Spek, T. &amp; van den Brink, A. (2015). The feasibility of implementing an ecological network in The Netherlands under conditions of global change. <i>Landscape Ecology</i>, 30(5), 791-804 DOI: 10.1007/s10980-014-0145-5</p> <p>This study also uses SRES to explore changes in Montado landscapes:</p> <p>Acosta-Michlik, L.A., Rounsevell, M.D.A., Bakker, M., Van Doorn, A., Gómez Delgado, M. &amp; Delgado, M. (2014). An agent-based assessment of land use and ecosystem changes in a traditional agricultural landscape of Portugal. <i>Intelligent Information Management</i>, 6, 55-80</p>	Thanks for highly relevant suggestions. The citations were included in section 5.2.1 and a separate box on local-scale scenarios.	
Mark Rounsevell	Ch.5	22	613	22	617	SRES and SSP based scenarios are lumped together, even though they refer to very different studies (different assumptions, different models, etc). The other examples in the list are for individual studies. Would it not be better to divide out the SRES/SSP scenarios into their individual studies? This would give a stronger sense of the number of studies. Also, the EURURALIS scenarios were largely derived from SRES, so it's difficult to separate these out.	In the updated version of the chapter, the inconsistency was avoided by focusing solely on the project-based families of scenarios. The abundance of SRES-based scenarios is emphasized in the following text of the chapter.
Mark Rounsevell	Ch.5	22	616		<p>Another SSP based study on forest change in Sweden that you might like to consider:</p> <p>Blanco, V., Holzhauer, S., Brown, C., Lagergren, F., Vulturius, G., Lindeskog, M. &amp; Rounsevell, M.D.A. (2017). The effect of forest owner decision-making, climatic change and societal demands on land-use change and ecosystem service provision in Sweden. <i>Ecosystem Services</i>, 23, 174–208</p> <p>Blanco, V., Holzhauer, S., Brown, C., Vulturius, G. &amp; Rounsevell, M.D.A. (2017). The importance of socio-ecological system dynamics in understanding adaptation to global change in the forestry sector. <i>Journal of Environmental Management</i>, 196, 36-47</p>	Thanks for highly relevant suggestions. The citations were included in the text.	
Ben ten brink	Ch.5	23	596	23	596	See also the scenario analysis made for the Global Biodiversity Outlook2 with a separate analysis for Europe, West and North Asia: 'CBD/MNP (2007). Cross-roads of Life on Earth; Exploring means to meet the 2010 biodiversity target. Solution-oriented scenarios for the Global Biodiversity Outlook 2. CBD Technical Series No. 31. /MNP report 555050001. Secretariat of the Convention on Biological Diversity and Netherlands Environmental Assessment Agency, Montreal en Bithoven.'	Thanks for highly relevant suggestion. The citation was included in the text.
The Netherlands: Astrid Hilgers	Ch.5	23	596	23	596	See also the scenario analysis made for the Global Biodiversity Outlook2 with a separate analysis for Europe, West and North Asia: CBD/MNP (2007). Cross-roads of Life on Earth; Exploring means to meet the 2010 biodiversity target. Solution-oriented scenarios for the Global Biodiversity Outlook 2. CBD Technical Series No. 31. /MNP report 555050001. Secretariat of the Convention on Biological Diversity and Netherlands Environmental Assessment Agency, Montreal en Bithoven.	Thanks for highly relevant suggestion. The citation was included in the text.
Tanya Lazarova	Ch.5	23	597	23	617	Perhaps these bullet points can be summarized in a table, this way they look a bit strange	This section was substantially rephrased and shortened.
Jean-Paul Hettelingh	Ch.5	24	641		The information content of Figure 5.8 is not easily placed in the context of this assessment. Moreover it uses "Pressures" in stead of the term "direct drivers" introduced as part of the IPBES assessment. It is recommended to choose the scenario family which is recommended for use in ECA and recommendations for policy.	The figure was omitted.	
Ben ten brink	Ch.5	24	641	641	Difficult figure to understand. More explanation is required	The figure was omitted.	
The Netherlands: Astrid Hilgers	Ch.5	24	641	24	641	The information content of Figure 5.8 is not easily placed in the context of this assessment. Moreover it uses "Pressures" in stead of the term "direct drivers" introduced as part of the IPBES assessment. It is recommended to choose the scenario family which is recommended for use in ECA and recommendations for policy.	The figure was omitted.
Hanna Skryhan	Ch.5	24	647	25	677	The text is very complicated. Is it possible to add some pictures and to simplify the text?	The section was shortened and substantially rephrased.
Mark Rounsevell	Ch.5	25	667	25	669	Quite difficult to characterise these disciplines, since most integrated assessment researchers might more readily recognise with being cross-disciplinary.	This sentence has been omitted.
Mark Rounsevell	Ch.5	25	671		See Murray-Rust reference given above	Reference included.	
ECA values liaison group	Ch.5	26	678		In box 5.5, please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Done	
ECA values liaison group	Ch.5	26	681	31	788 Scenarios (5.2.3/Fig. 5.11/Fig. 5.12): Check which valuation steps are not/covered in this section and adapt if necessary, and write a comment on how to improve with the aim of a more coherent, integrated and well-structured treatment of valuation cfr. Definitions and table in chapter 1.	In the description of results presented in section 5.2.3. all valuation steps considered in chapter 1 are included in the results of analysis.	
Henk van Zeijts	Ch.5	28	720	30	780 This text is problematic and I would suggest to remove it completely. Indeed, explorative scenarios use world views. But linking this to Cultural Theory is not well-established. And linking Cultural Theory with nature views is not established at all. When creating (exploratory or normative) scenarios, you can use variations in how people view nature in scenarios, but only for the purpose of structuring and creating contrasting storylines. In the current text, there is a risk of circular reasoning, see for example the use of Beumer and Martens, they look at assumptions on cultural perspectives and attitudes to nature in global scenario studies, but you cannot use this as evidence that certain cultural perspectives are linked with certain nature perspectives. Figure 5.12 raises questions on how percentages are derived.	All the references to the cultural theory were removed in the new version because the connection between values and world views were not considered sufficiently established.	
The Netherlands: Astrid Hilgers	Ch.5	28	720	30	780 This text is problematic and perhaps it should be removed completely. Indeed, explorative scenarios use world views. But linking this to Cultural Theory is not well-established. And linking Cultural Theory with nature views is not established at all. When creating (exploratory or normative) scenarios, one can use variations in how people view nature in scenarios, but only for the purpose of structuring and creating contrasting storylines. In the current text, there is a risk of circular reasoning, see for example the use of Beumer and Martens. They look at assumptions on cultural perspectives and attitudes to nature in global scenario studies, but this cannot be used as evidence that certain cultural perspectives are linked with certain nature perspectives. Figure 5.12 raises questions on how percentages are derived.	All the references to the cultural theory were removed in the new version because the connection between values and world views were not considered sufficiently established.	
ECA values liaison group	Ch.5	28	720	28	728 Please consider the following edited version: "The representation of values within the Europe and Central Asia scenarios has been compared with the scenario archetypes by considering how the different dimensions of value relate to different conceptualizations of the world. In the last two decades, several environmental studies have successfully included different views of the world in scenarios (Beumer & Martens, 2010; Middelkoop et al., 2004; Valkering, Brugge, Offermans, & Rijkens - Klomp, 2011) and integrated assessments (Hoekstra, 2000; Van Asselt and Rotmans, 2002) by understanding different cultures. Cultural Theory identifies four cultures to which individuals belong, based on the level of social regulation and level of membership to a group (Douglas, 1970; Thompson et al., 1990). These cultures consist of different views of the world, including views about nature (known as myths of nature) (Figure 5.11)."	All the references to the cultural theory were removed in the new version because the connection between values and world views were not considered sufficiently established.	
ECA values liaison group	Ch.5	28	720	28	728 The representation of values within the scenarios archetypes through considering how the different dimensions of value relate to worldviews seem to coherent. However it might need a further explanation how this link is made. Add a short explanation within this paragraph.	The relation with world views has been omitted in response to previous reviewer comments. The relation between scenarios archetypes and values has been better explained in the text. It was done through a systematic review of the scenario literature based on value characteristics.	

ECA values liaison group	Ch.5	28	722	28	723	Worldviews as used here are different to worldviews as used in IPBES more generally. Also adding worldviews here adds another layer in the argumentation that is potentially confusing to the reader. New wording also tries to make clearer what has actually been done and simplify language	The concept of worldviews has been omitted to avoid confusion.
Denmark	Ch.5	28	751			we do not agree to include box spm1	This comment does not refer to chapter 5
ECA values liaison group	Ch.5	29	735	29	741	Please consider the following edited version: "This approach enables us to identify how different 'cultures' perceive the relationship between nature and human systems and this in turn has implications on how they refer to values of nature. Similarly, different cultures can be associated with different management styles to highlight the types of responses that are likely to be accepted or rejected. Based on these studies, trends in socio-economic and nature worldviews (influencing drivers) and corresponding management styles (influencing responses and actions) we identified (Table 5.4) to match the scenario archetypes."	All the references to the cultural theory were removed in the new version because the connection between values and world views were not considered sufficiently established.
Denmark	Ch.5	29	772			we do not agree to include table 1	Unfortunately, we did not understand this comment.
ECA values liaison group	Ch.5	30	763	31	778	Add a sentence to explain how this has been derived and what it shows. The figure without any explanation is confusing and does not do justice to the thinking behind. Something like: "We have grouped the scenarios that do refer to values according and calculated the average of the types of values they refer to. The different emphasis different types of scenarios place on different types of values is clearly notable." (any statistical significance?) There is a further issue with the figure. While the horizontal categories (individual – group) are equivalent to the 'cultures' graphic categories, the vertical global and regional are a sort of analogy to externally imposed restrictions vs. no externally imposed restrictions but that needs a sentence of explanation. E.g. that regional scenarios imply and assume a much higher degree of agency and thus the possibility to pro-active behavior than global ones.	The figure has been re-designed. The axes have been omitted, so that it simply shows the % of the number of studies that relate to each value.
ECA values liaison group	Ch.5	31	779	31	780	(Figure 5.12). The figure presented is clear and understandable however for a better interpretation of the results it might be need it a short paragraph explaining the figure and the main conclusion out of the analysis	The figure is described with a paragraph about values in each of the scenarios archetypes.
PESC-4: Hanna Skryhan	Ch.5	31	790	38	1069	section 5.2.4.1: make the text more clear. Harmonise the description between all archetypes.	The section was substantially restructured and rephrased to harmonise the description of the scenario archetypes.
Mark Rounsevell	Ch.5	32	797	32	798	Nice table, but there doesn't seem to be any examples of national scenario studies, other than the UK. Yet the text gives other national examples, e.g. for Germany, Romania. Could these studies be added? Also, it would be really useful (to be comprehensive) to include at least some examples of sub-national scenario studies.	More national examples were added to the table. Unfortunately, it was not possible to add all examples from the text, since the table focuses solely on scenarios covering six and more driver categories. Sub-national scenario studies were not reviewed systematically; therefore, we did not include them in the table since the selection of examples would be artificial.
Hanna Skryhan	Ch.5	32	839	32	840	add the description of the arrow directions	Description of arrows was added to the table caption.
Hanna Skryhan	Ch.5	33	843	38	1069	a lack of the coherence of the scenario description. More clarifications for better distinguishing between scenarios. And in the every scenario the authors' opinion is needed.	The descriptions of the scenario archetypes were rephrased and harmonised. An initial overview of each archetype was added for clarification.
PESC-4: Jeroen Arends	Ch.5	38	1056	38	1069	In the 5.2.4.6 section, there is not much information on how future investments from not only governments but also financial institutions are expected to be directed. Next to that, there is talk of biofuels and technological innovation but they are not very well described. The scenarios also say little about moving away from fossil fuels. Again biofuels are mentioned but biofuels clash with food provisioning. Perhaps more can be said on what kind of technological innovations (regarding fuel efficiency, new sustainable sources of energy, hydrogen fuel, nuclear fusion, nano technologies, etc.) and the investment sources that will invest in their development. Tesla is just one example. Another can be solar energy which is expected to become much more efficient. Can something be said there about how investors will direct their investments into these cleaner, sustainable and innovative developments?	This section is informed solely by the insights from the review of exploratory scenarios. The very relevant topics you suggest were unfortunately covered to only a limited extent by the reviewed scenarios. In the description of the archetypes, we add these details where sufficient information was available.
Ben ten brink	Ch.5	38	1070	45	1289	this section is highly methodological oriented and would be more suitable as supplementary information in an Annex. A summary can be given as an introduction to the rest of section 5.3	The whole section has been significantly reduced and methodological information greatly reduced, while the focus of the text is now centered on the results and their implications.
The Netherlands: Astrid Hilgers	Ch.5	38	1070	45	1289	this section is highly methodological oriented and would be more suitable as supplementary information in an Annex. A summary can be given as an introduction to the rest of section 5.3	The whole section has been significantly reduced and methodological information greatly reduced, while the focus of the text is now centered on the results and their implications.
PESC-4: Hanna Skryhan	Ch.5	38	1070	59	1767	in general, section 5.3 is very well written. Easy to read. Congratulations to the authors	Thank you
Mark Rounsevell	Ch.5	40	1125	40	1126	that models contribute to scenario studies (see my comment at the beginning of the chapter for more suggestions). It would also be useful to have some example references for each of the model types given in the box.	We have reduced the discussion on modelling typologies to reduce the methodological biases of the SOD. The different types of integrated models and their associated uncertainties are now briefly introduced in a box with references for more details to Kelly et al. 2013 and the IPBES Scenarios and Models deliverable.
ECA values liaison group	Ch.5	40	1128			In box 5.6, please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	"wellbeing" was not used in Box 5.6. Nevertheless, this box has now been omitted and a very brief introduction to types of integration included in another box providing an overview of integrated assessment models and their uncertainties
PESC-4: Zoi Konstantinou	Ch.5	40	1128	40	1129	box 5.6 is crucial. Very relevant.	The information from Box 5.6 has been integrated into the beginning of new Box 5.4.
ECA values liaison group	Ch.5	40	1134			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Done
Mark Rounsevell	Ch.5	40	1136			"...The information gathered ranged from sub-national studies...": This contradicts the earlier statement about not assessing sub-national studies.	Section 5.3 revolves around a systematic review of studies using integrated approaches assessing impacts on nature and NCP and this includes sub-national studies. Section 5.2 undertook a separate review of exploratory scenarios which did not include sub-national studies. This was because there are a limited number of papers covering integrated modelling studies, so this literature search was deliberately made as wide as possible.
PESC-4: Zoi Konstantinou	Ch.5	41	1141	41	1166	whole paragraph could be reduced	The paragraph has been significantly shortened
ECA values liaison group	Ch.5	41	1160			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Sentence omitted as paragraph was shortened
Henk van Zeijts	Ch.5	42	1195	45	1271	By compiling all studies into aggregate future trends for the indicators, all scenarios are treated the same, whereas it would be informative to divide between business-as-usual-like scenarios and extreme exploratory scenarios. Putting it otherwise: what lies behind the range of outcomes? The current aggregate way of presenting, is more suitable for a background document, not for the main report.	We agree with the reviewer and have omitted this section. We focus on providing more detailed description of the results for each scenario archetype.
The Netherlands: Astrid Hilgers	Ch.5	42	1195	45	1271	By compiling all studies into aggregate future trends for the indicators, all scenarios are treated the same, whereas it would be informative to divide between business-as-usual-like scenarios and extreme exploratory scenarios. Putting it otherwise: what lies behind the range of outcomes? At the same time, it is a nice addition to explain the relation between chapter 3 and 5.	We agree with the reviewer and have omitted this section. We focus on providing more detailed description of the results for each scenario archetype.

ECA values liaison group	Ch.5	42	1199		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been omitted
ECA values liaison group	Ch.5	42	1204		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been omitted
ECA values liaison group	Ch.5	42	1208		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been omitted
ECA values liaison group	Ch.5	43	1216		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been omitted
PESC-4: Machted Schoonberg	Ch.5	43	1216	43	1219 table 5.6 is good	Thank you, but to save space we now describe the contents of this table in the main text.
PESC-4: Zoi Konstantinou	Ch.5	43	1216	43	1219 table 5.6 can be confusing for people who did not read chapter 3. Should not be there.	This section has been omitted
ECA values liaison group	Ch.5	43	1221		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been omitted
ECA values liaison group	Ch.5	43	1239		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been omitted
ECA values liaison group	Ch.5	44	1247		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been omitted
Mark Rounsevell	Ch.5	45	1272		There's a lot of good contente in this section, but the text tends to be more of a literature review than a synthesis of the main outcomes.	We have provided a more synthetic description of the results for each scenario archetype. Regional variation in results is embedded within the results by scenario archetype to avoid repetition.
ECA values liaison group	Ch.5	45	1283	45	1288 Replace 'wellbeing' with 'Quality of Life' in figure 5.15	Done in the revised version of this figure
Germany	Ch.5	45	1284	45	1288 This figure shows some contradicting evidence. Please elaborate on the consequences of this.	We are not sure exactly what the reviewer is referring to here, but the figures have been redrawn and checked to avoid contradictory evidence.
ECA values liaison group	Ch.5	45	1284		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Done in the revised version of this figure
Ben ten brink	Ch.5	46	1289	56	1672 the description of future changes is for a great deal qualitative and unspecified. 'Increases' and 'decreases' require specification in terms of issue, extent, time and space. Quantitative information is available and much more informative, in particular when related to clear reference data (baselines, targets, demand, critical levels,...). Ranges can be given to show different outcomes. To keep the information digestible-the capacity of the human brain is limited- a selection of key indicators (end points) is required. The figures are too complex and unspecific to get the message. The synthesis of the work is lacking.	Section completely rewritten to strengthen generalities of impacts across scenario archetypes. Quantified information has been included where available from the papers (but we were not always able to extract such information from maps or other types of figures within the published papers). Also figures have been re-designed in order to facilitate interpretation by reader while keeping the initial objectives in mind.
The Netherlands: Astrid Hilgers	Ch.5	46	1289	56	1672 the description of future changes is for a great deal qualitative and unspecified. 'Increases' and 'decreases' require specification in terms of extent, time and space. Quantitative information is available and much more informative, in particular when related to clear reference data (baselines, targets, demand, critical levels,...). Ranges can be given to show different outcomes. To keep the information digestible given the limited capacity of the human brain, a selection of key indicators (end points) is required. The figures are too complex and unspecific to get the message	Section completely rewritten to strengthen generalities of impacts across scenario archetypes. Quantified information has been included where available from the papers (but we were not always able to extract such information from maps or other types of figures within the published papers). Also figures have been re-designed in order to facilitate interpretation by reader while keeping the initial objectives in mind.
ECA values liaison group	Ch.5	46	1292		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.
Germany	Ch.5	46	1321	46	1321 in l. 1307 of the same page a study found that [...] food production and water exploitation...are projected to increase...] "at the expense of forest areas". Please address this obvious contradiction	Food production increases by expanding agricultural area which leave less land area for forestry. Water exploitation increases due to higher demands for irrigation from the expanded agricultural area as well as increasing water demands from other sectors.
Germany	Ch.5	47	1346	47	1350 see earlier comment on fig. 5.15. This is not clear	Figure has been redrawn
ECA values liaison group	Ch.5	47	1346		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.
ECA values liaison group	Ch.5	47	1349		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.
ECA values liaison group	Ch.5	47	1351		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "ecosystem services" has been replaced by "NCP" throughout.
ECA values liaison group	Ch.5	47	1351		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.
ECA values liaison group	Ch.5	47	1354		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "ecosystem services" has been replaced by "NCP" throughout.
ECA values liaison group	Ch.5	47	1356		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.
ECA values liaison group	Ch.5	48	1375		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "ecosystem services" has been replaced by "NCP" throughout.
ECA values liaison group	Ch.5	49	1429		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "ecosystem services" has been replaced by "NCP" throughout.
ECA values liaison group	Ch.5	49	1443		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "ecosystem services" has been replaced by "NCP" throughout.
ECA values liaison group	Ch.5	49	1448		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.

Heino Meessen	Ch.5	50	1474		This section will benefit from the addition of a text box about "Challenges of Biodiversity conservation and management of Large Protected Areas in TRANSITION countries of Eastern Europe including this text: And as to say it with words of local residents in the biodiversity "hot spot" region of Lagodekhi in Georgia: "The international goals of biodiversity conservation related to international convention like CBD have been reached by our government, - but local-level resource management and participation of and benefits for local people is another story. Many local residents in Azerbaijan and Georgia, for example, feel that their local situation is not given enough attention. As one villager put it, "Much is done in [the capital cities] Tbilisi and Baku, but what about natural resources use of wood, water, pastures – restricted by the governmental regulation on nature conservation in our villages?" in: Journal of Alpine Research, Revue de géographie alpine. 103-3 (2015) Heino Meessen, Juraj Švajda, Thomas Kohler, Vladimíra Fabričiusová, Dobromil Galvánek, Miroslav Buraf, Marcela Káčerová et Ján Kadlecik. Protected Areas in the Slovak Carpathians as a Contested Resource Between Metropolitan and Mountain Stakeholders On the Road to Local Participation	Thank you for the interesting suggestion. Unfortunately we were not able to include the suggested box because of the focus of this section on integrated scenario and modelling studies. The example is possibly relevant to Chapter 2, which considers past, current and future dynamics of the relationship between NCP and a good quality of life
ECA values liaison group	Ch.5	50	1476		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.
ECA values liaison group	Ch.5	50	1499		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "ecosystem services" has been replaced by "NCP" throughout.
ECA values liaison group	Ch.5	51	1516		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.
ECA values liaison group	Ch.5	51	1522		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "ecosystem services" has been replaced by "NCP" throughout.
Tanya Lazarova	Ch.5	52	1546		A number of the figures are very difficult to read, including figure 5.16, 5.18, 5.8., 5.20, 5.21, tables 5.7 and 5.8	Figures have been redesigned, and when possible simplified or made more visual (i.e. a new figure with spatial information in form of maps has been added).
ECA values liaison group	Ch.5	52	1546	52	1555 Replace 'wellbeing' with 'Quality of Life' in figure 5.16	Figure has been redrawn and wellbeing replaced by good quality of life in the new figure
ECA values liaison group	Ch.5	53	1569		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.
ECA values liaison group	Ch.5	53	1603		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and rewritten, but "wellbeing" has been replaced by "good quality of life" throughout.
Mark Rounsevell	Ch.5	53	1608		Perhaps explain/justify why this example was chosen? Reasonable arguments might be: European coverage (not a global IAM), range of ES indicator outputs, multiple ecosystems and sectors, multiple drivers, stakeholder engagement process, extensively published, ...  Perhaps add something on the uncertainty work done in this study?	The example has been moved to a box. An explanation of why it was chosen is provided in the title as it is regional (European), covers the scenario archetypes included in the section and a large number of indicators
ECA values liaison group	Ch.5	54	1633		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Done
ECA values liaison group	Ch.5	55	1644		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Done
ECA values liaison group	Ch.5	55	1669		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Sentence omitted from final version
Mark Rounsevell	Ch.5	56	1687	56	1688 Again, I think the uncertainties and differences between these models need to be highlighted here as a caveat for there use to support decision-making. See comment at start of chapter.  Is there a way of making this section more ECA-specific (not just global)?	This section has been omitted from Section 5.3. A simplified version of this section has been put in a Box 5.11 in Section 5.5 to illustrate modelling of pathways or normative scenarios. A new box 5.4 has been added which discusses uncertainties from complex integrated assessment models.
ECA values liaison group	Ch.5	56	1687		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Section shortened and moved to Section 5.5 (Box 5.11). "Ecosystem services" has been replaced by "NCP" throughout.
Tanya Lazarova	Ch.5	56	1704	56	1712 Perhaps in this paragraph, in order to be more precise, it is better to talk about the indicator MSA (Mean Species Abundance), instead of "biodiversity loss".	We used the information provided by the IPBES Scenarios and Models TSU for this figure and its description. We realise that using MSA in the text is more precise, but it is also less accessible to a general audience. Hence, we prefer to maintain "biodiversity loss" in the paragraph, but refer to the figure for the specific results upon which this is based.
Tanya Lazarova	Ch.5	57	1717		Here, you can cite the original publication of PBL (2012) ( <a href="http://www.pbl.nl/sites/default/files/cms/publicaties/PBL_2012_Roads%20from%20Rio_500062001.pdf">http://www.pbl.nl/sites/default/files/cms/publicaties/PBL_2012_Roads%20from%20Rio_500062001.pdf</a> ), where the pathways come from.	Citation added to figure caption.
ECA values liaison group	Ch.5	58	1759		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Done
Ben ten brink	Ch.5	59	1768	74	2172 Quite technical analysis of world views. It is hard to extract the policy message out of it.	We have now tried to revise the text and added an indepth analysis on SDGs and Aichi targets to improve policy relevance.
Henk van Zeijts	Ch.5	59	1768	whole section	It is not clear why Visions of sustainable development has been chosen as a title. This seems very broad: sustainable development is about everything. The word 'nature' is missing, e.g. nature-inclusive sustainable development. At least, this choice should be explained.	We have selected visions using a very broad definition of sustainable development, therefore we think the heading is justified
ECA values liaison group	Ch.5	59	1768		It is no connection between the Visions described and values. To be consistent with other sections in this chapter this might need an individual heading a figure to explain better the results between how the visions and values are connected.	The values work in the chapter focused on the scenarios, models and pathways. Dimensions of sustainability (in terms of biophysical, social and economic) were assigned to SDGs based on the paper by (Folke, Biggs, Norström, Reyers, & Rockström, 2016) in the figures relating the visions to the SDGs. The SDGs have then been interpreted in terms of their value dimensions in Section 5.5 on the pathways (which address these visions).
ECA values liaison group	Ch.5	59	1768		Add an analysis of values for vision section	We did not find the way to review the vision documents in relation to values (as was done for scenarios, models and pathways).
Tanya Lazarova	Ch.5	59	1769		In section 5.3.5 and figure 5.19 you present data from the PBL 2012 study, where a back-casting approach was used to develop different pathways to sustainability. Perhaps that information would fit better in this section on pathways (5.4), or at least, perhaps point that out in this sentence, as now it looks like all studies discussed in sections 5.2. and 5.3 are exploratory.	Thank you very much for your suggestion. We have now moved the PBL 2012 study to the pathways section.

Henk van Zeijts	Ch.5	59	1781		Also, 'good quality of life' is very broad. Isn't this overlapping with ncp's?	Good quality of life and NCP are terms defined as part of the IPBES conceptual framework
ECA values liaison group	Ch.5	59	1785	62	1915 Visions (5.4.1/5.4.2): suggestion to check which valuation steps are not/covered in this section and adapt if necessary and realistically possible, or write a comment on how to improve with the aim of a more coherent, integrated and well-structured treatment of valuation cfr. Definitions and table in chapter 1. and valuation steps in Pascual et al.	We did not find the way to review the vision documents in relation to values (as was done for scenarios, models and pathways).
ECA values liaison group	Ch.5	59	1804		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and shortened, but all mentions of "wellbeing" have been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	60	1817		Please replace the term "biodiversity and ecosystems" by "nature" if relevant - to align with IPBES CF and the other chapters	This is referring to a specific Strategic Goal of the CBD Aichi Target, so we think it is more appropriate to maintain the wording
ECA values liaison group	Ch.5	60	1833		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This is a quote from the EC, so can't changed
Henk van Zeijts	Ch.5	61	1851 whole section		Why are global studies included?	We have now considerably decreased the results of the global studies. However, since we are doing a cross-scale analysis, we left some results, which were used for comparison.
ECA values liaison group	Ch.5	61	1866		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and shortened, but all mentions of "wellbeing" have been replaced by "good quality of life" where appropriate
The Netherlands: Astrid Hilgers	Ch.5	61	1867	62	1915 Shorten this paragraph. No need for such detail	We have now considerably shortened this section.
Natalya Minchenko	ch.5	61	1887	62	1900 Add - For Belarus there are: National Strategy of Sustainable Social & Economic Development till 2030; National plan for green economy development in Belarus till 2020; NATIONAL STRATEGY FOR DEVELOPMENT OF THE SYSTEM OF SPECIALLY PROTECTED NATURAL AREAS till 2030; Strategy for the Conservation and Wise (Sustainable) Use of Peatlands; National Action Plan for the Conservation and Sustainable Use of Biological Diversity for 2016-2020 and Strategy for the Conservation and Sustainable Use of Biological Diversity. references - <a href="http://www.economy.gov.by/uploads/files/NSUR2030/Natsionalnaja-strategija-ustojchivogo-sotsialno-ekonomicheskogo-razvitiya-Respubliki-Belarus-na-period-do-2030-goda.pdf">http://www.economy.gov.by/uploads/files/NSUR2030/Natsionalnaja-strategija-ustojchivogo-sotsialno-ekonomicheskogo-razvitiya-Respubliki-Belarus-na-period-do-2030-goda.pdf</a> ; <a href="http://minpriroda.gov.by/ru/news-ru/view/natsionalnyj-plan-dejstvij-po-razvitiyu-zelenoj-ekonomiki-v-respublike-belarus-do-2020-goda-1958/">http://minpriroda.gov.by/ru/news-ru/view/natsionalnyj-plan-dejstvij-po-razvitiyu-zelenoj-ekonomiki-v-respublike-belarus-do-2020-goda-1958/</a> ; <a href="http://www.minpriroda.gov.by/ru/news-ru/view/pravitelstvom-prinjata-strategija-ratsionalnogo-ispolzovaniya-torfjanikov-1804/">http://www.minpriroda.gov.by/ru/news-ru/view/pravitelstvom-prinjata-strategija-ratsionalnogo-ispolzovaniya-torfjanikov-1804/</a> ; <a href="http://www.government.by/upload/docs/file49546bb195494017.PDF">http://www.government.by/upload/docs/file49546bb195494017.PDF</a> ; <a href="http://www.minpriroda.gov.by/ru/news-ru/view/3-sentjabrja-2015-goda-postanovleniem-sovetom-ministrov-respubliki-belarus-743-utverzhden-natsionalnyj-plan-1752/">http://www.minpriroda.gov.by/ru/news-ru/view/3-sentjabrja-2015-goda-postanovleniem-sovetom-ministrov-respubliki-belarus-743-utverzhden-natsionalnyj-plan-1752/</a>	Thank you very much for pointing out this study, which we have now included in our analysis
ECA values liaison group	Ch.5	62	1903		Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and shortened, but all mentions of ecosystem services have been replaced by "NCP where appropriate"
ECA values liaison group	Ch.5	62	1903		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and shortened, but all mentions of "wellbeing" have been replaced by "good quality of life" where appropriate
Henk van Zeijts	Ch.5	62	1908		12 for Europe', does this include EU-studies? In that case, it might be an idea to split between EU and Europe (as the latter is much bigger than EU). Is the Naturet Outlook by PBL included by the 12, as this study would clearly under the category of visions (normative scenarios).	We have now included a list of studies reviewed for the visions section in an electronic annex, including information on the spatial extent of each study. The PBL study was included in the pathways section in an indepth analysis within Box 5.11.
Mark Rounsevell	Ch.5	62	1916		Would it be useful to include a table or list of relevant envisioning studies as was done in the section on explorative scenarios?	We have now included a list of studies reviewed for the visions section in an electronic annex.
Henk van Zeijts	Ch.5	62	1916	66	2006 Information is -indeed- characterising the visions, but little is said about the content of the visions. When we talk about biodiversity and ncp's, what are the most important	We have now revised the visions section and included more information on visions characteristics.
Mark Rounsevell	Ch.5	62	1919	62	1920 I'm a bit surprised by this. Although, much of the urban/transport envisioning is done at the city level, I would have thought that it included the broader hinterland (region) of a city.	We did not find visions on urban/transport at the regional (or supra-national scales), these visions are mostly developed for scales lower than the regional level.
ECA values liaison group	Ch.5	63	1952		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and shortened, but all mentions of "wellbeing" have been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	63	1957		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and shortened, but all mentions of "wellbeing" have been replaced by "good quality of life" where appropriate

Natalya Minchenko	ch.5	64	1969	65	1972	<p>Add - Visions for peatlands protected areas in Belarus. For peatlands conservation the Ministry of natural resources and environmental protection of the Republic of Belarus has developed the Strategy for the Conservation and Wise (Sustainable) Use of Peatlands which was approved by the Resolution of the Council of Ministers of the Republic of Belarus 30.12.2015 No. 1111. Below are the key problems pertaining to the conservation and wise (sustainable) use of peatlands:</p> <ul style="list-style-type: none"> <li>- disturbance of the hydrological regime of mires by the drainage network of canals of the adjoining ameliorative, forest hydrological amelioration systems, peat extraction fields (total area of mires with partially disturbed hydrological regime is approximately 516 thousand ha);</li> <li>- overgrowth of open mire ecosystems with forests, shrubs, reeds as a result of cessation of their traditional use, eutrophication of surface waters, disturbance of the hydrological regime;</li> <li>- peat extraction on mires, which are in their natural or near natural state;</li> <li>- insufficient consideration of the agricultural and environmental state of the territories, peculiarities of the soil cover and amount of moisture during planning of areas under crops on drained lands with peat soils; plowing of approximately 318.1 thousand ha of lands with peat soils with intensive loss of organic matter;</li> <li>- presence of about 190.2 thousand ha of degraded lands with peat soils used in agriculture, and 281.5 thousand ha of peat deposits withdrawn from commercial exploitation;</li> <li>- peat consumption exceeding peat increment by 12 times - annual loss of peat due to agricultural use and peat extraction is 12.8 million tons a year, while annual accumulation of peat in mires is just 1.04 million tons;</li> <li>- release of 16.7 million tons of CO<sub>2</sub> into the atmosphere from peatlands (4.45 million tons of carbon) a year, while mires absorb just 0.9 million tons of CO<sub>2</sub> (0.23 million tons of carbon) a year;</li> <li>- insufficient use of mires' biological resources (cranberries, plant biomass);</li> <li>- peat fires and drainage effect of ameliorative canals, constructed in 1960 - 1980 for use in forestry, on raised bogs with deep cotton grass and sphagnum peats and on black alder plantations on mineral hydromorphic soils with low peat content; lack of a system for regulating water level on drained forest lands.</li> </ul> <p>To ensure conservation and use of peatlands in such a way and at such a rate, which in the long term do not cause their depletion and thus make it possible to preserve their ability to meet the environmental, economic, aesthetic and other needs of the present and future generations, in the Strategy the following key principles were set:</p> <ul style="list-style-type: none"> <li>- strict and/or special conservation of mires preserved in the natural or near natural condition;</li> <li>- conduct of peat extraction mainly at peat deposits, where preparatory works (drainage canals network) were conducted, or the restoration of the hydrological regime of which is impossible or inexpedient; on ineffectively drained by forest amelioration peatlands, the re-wetting of which is inexpedient; on ineffectively used drained agricultural lands, the ameliorative systems of which are not subject to restoration;</li> <li>- use of drained agricultural lands with peat soils using methods and approaches, which ensure minimum loss of organic matter and preservation of soils fertility;</li> <li>- environmental rehabilitation of disturbed peatlands, further effective use of which is impossible.</li> </ul> <p>One of the focus area to implement the strategy is ensuring conservation and wise (sustainable) use of mires preserved in the natural or near natural condition through:</p> <ul style="list-style-type: none"> <li>- designation of unique, model and other valuable mire ecosystems as strictly protected natural areas;</li> <li>- identification and transfer of rare and typical mire biotopes for protection to land and/or water users;</li> <li>- sustainable management of strictly protected natural areas, rare and typical biotopes;</li> <li>- development of ecotourism and establishment of the necessary infrastructure;</li> <li>- effective use of the mires' plant biomass.</li> </ul> <p>environmental rehabilitation of disturbed peatlands.</p> <p>The implementation of the Strategy in the Republic of Belarus will result by 2030 in the following:</p> <ul style="list-style-type: none"> <li>- preservation of 684 thousand ha of mires in their natural state; investigation of 179 thousand ha of mires and determining measures to ensure their conservation;</li> <li>- restoration of at least 15 per cent of the area (at least 75,000 ha) of disturbed peatlands (depleted parts of peat deposits, degraded lands with peat soils, mires ineffectively drained by forest amelioration);</li> <li>- preservation in mires of over 7 billion cubic metres of fresh water and ensuring sustainable water supply of rivers and lakes;</li> <li>- preservation in mires of approximately 500 million tons of carbon and so on.</li> </ul>	Thank you very much for making us aware of this document. We considered it carefully, for including it in our review, but decided to not include it as it did not meet our review criteria.
Henk van Zeijts	Ch.5	66	2008	74	2172	I am not sure why you would want to know which SDG's and Aichi targets are in the visions and the connection between SDG's and Aichi; is this information necessary to the reader? And, if so, can this be summarised in 2 pages in stead of the difficult text and tables?	We added the coherence analysis of visions with SDGs and Aichi targets as we believe that it will increase the relevance for policy makers. Figures/tables have been revised to make them easier to read.
ECA values liaison group	Ch.5	67	2043			include a paragraph how values could be connected to individual SDGs.	This is explained in the text that follows Figure 5.15
ECA values liaison group	Ch.5	69	2061	70	2067	In table 5.8, please replace the term "biodiversity and ecosystems" by "nature" if relevant - to align with IPBES CF and the other chapters	This is referring to a specific Strategic Goal of the CBD Aichi Target, so we think it is more appropriate to maintain the wording. However, the table is now omitted and replaced by the simpler flower diagrams.
ECA values liaison group	Ch.5	69	2061			include a paragraph how values could be connected to individual SDGs.	This is explained in the text that follow Figure 5.15
The Netherlands: Astrid Hilgers	Ch.5	70	2076	70	2084	This is just one side of the story. Indeed, intensification have consequences for B and ES at the plot, but the alternative, agricultural expansion has larger consequences for Biodiversity and ES such as water holding capacity, carbon storage in vegetation and soil, and this climate mitigation because of the increased loss of natural habitat. Without intensification, Europe had lost much of its nature by now.	We acknowledge the importance of a deeper discussion on the alternatives for the planning of agricultural landscapes, including intensification vs. extensification. Unfortunately, we did not have the space to discuss this topic in more depth as the whole section was significantly shortened.
Germany	Ch.5	71	2076	71	2077	This seems to be quite an important finding. This might hence have to be highlighted a bit more.	We have now shifted the analysis to the very beginning of our chapter and added corresponding figures to make the findings more prominent.
ECA values liaison group	Ch.5	71	2086			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and shortened, but all mentions of "wellbeing" have been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	71	2089			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Section has been restructured and shortened, but all mentions of "wellbeing" have been replaced by "good quality of life" where appropriate
Jean-Paul Hettelingh	Ch.5	72	2114			While this section is vital in the IPBES, it is recommended that an effort is made to seek synergy between the driver-impact relationships of chapter 4 and the synergy between SDGs and Aichi targets treated herein.	This sub-section has been omitted as part of the restructuring and shortening of this section
The Netherlands: Astrid Hilgers	Ch.5	72	2114	74	2172	While this section is vital in the IPBES, it is recommended that an effort is made to seek synergy between the driver-impact relationships of chapter 4 and the synergy between SDGs and Aichi targets treated herein.	This sub-section has been omitted as part of the restructuring and shortening of this section
PESC-4: Machteld Schoonenberg	Ch.5	72	2132	72	2132	5.4.6. fig 5.20 is interesting but should not appear in the chapter. Could be moved to global assessment or as an annex to ECA assessment.	Figure has been omitted

The Netherlands: Astrid Hilgers	Ch.5	73	2140	73	2140	Figure 5.20 suggestion to delete this table and keep only the ECA figure, and mention the difference between ECA and global in text.	Figure has been omitted
Ben ten brink	Ch.5	74	2173	86	2601	Quite technical analysis of sustainable pathways. It is hard to extract the policy message out of it.	We have revised the analysis and text to make it more policy relevant.
The Netherlands: Astrid Hilgers	Ch.5	74	2173	86	2601	Quite technical analysis of sustainable pathways. It is hard to extract the policy message out of it.	We have revised the analysis and text to make it more policy relevant.
Mark Rounsevell	Ch.5	74	2174			A recently published paper from the Volante project that might be of use here:  Brown et al (2016). Land managers' behaviours modulate pathways to visions of future land systems. <i>Regional Environmental Change</i> , DOI: 10.1007/s10113-016-0999-y	Thank you! We have now included this paper.
ECA values liaison group	Ch.5	74	2174	81	2406	Pathways (5.5.1/S.5.2): Check which valuation steps are not/covered in this section and adapt if necessary, and write a comment on how to improve with the aim of a more coherent, integrated and well-structured treatment of valuation cfr. Definitions and table in chapter 1.	We have added a general description of values for the pathways literature and a more detailed description of the values that are represented within each pathway.
ECA values liaison group	Ch.5	75	2188			Please replace the term "biodiversity and ecosystems" by "nature" if relevant - to align with IPBES CF and the other chapters	Changed
ECA values liaison group	Ch.5	75	2201			Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Changed
ECA values liaison group	Ch.5	75	2201			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Changed
ECA values liaison group	Ch.5	75	2212	75	2219	Rewrite this paragraph. It is no clear how the different types of values are linked with the classification of Visions. To be consistent with the Scenarios section this might need a an individual heading a figure to explain better the results.	We have added a general description of values for the pathways literature and a more detailed description of the values that are represented within each pathway. Values were not assessed for the visions.
ECA values liaison group	Ch.5	76	2220			I box 5.10, please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Changed
ECA values liaison group	Ch.5	76	2220			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Changed
Henk van Zeijts	Ch.5	76	2231			This seems too much global-oriented: 'producing food for nine billion', whereas this IPBES report is about ECA.	We have now revised the whole chapter to focus on Europe and Central Asia.
Henk van Zeijts	Ch.5	76	2235			These [global] trade-offs translated to a series of trade-offs ... I am not sure if this 'translated to' is correct, as many of the trade-offs are specific for Europe.	The section has been revised.
Henk van Zeijts	Ch.5	76	2235	77	2249	Text suggestion to be added here: "From the point of view of people's perspectives in the EU, most conflicts and synergies potentially occur in urbanised and mountainous regions. In urban and peri-urban regions, synergies can be found between characteristic landscapes that are attractive for recreation and provide regulating services, like pollination. Conflicts could arise between development of private landscape parks and free accessibility for recreation and between intensive agriculture and attractiveness of landscapes. For mountainous areas, regulating services, such as water retention and carbon sequestration, would be compatible with large-scale development of wild nature and private parks for tourism. An example of conflict would be the combination between large nature areas with natural dynamics, and the conservation of historically characteristic landscapes (Van Zeijts et al., 2017; Prins et al., 2017)." Van Zeijts H, Prins A, Dammers D, Vonk M, Bouwma I, Farjon H and Pouwels R. (2017). European nature in the plural. Finding common ground for a next policy agenda. PBL Netherlands Environmental Assessment Agency, The Hague. Prins AG, Pouwels R, Clement J, Hendriks M, De Knecht B, Petz K, Beusen A, Farjon H, Van Hinsberg A, Janse J, Knol B, Van Puijenbroek P, Schelhaas M-J and Van Tol S. (2017). Perspectives on the future of nature in Europe: impacts and combinations. PBL Netherlands Environmental Assessment Agency, The Hague.	Thank you! We have added the text.
Henk van Zeijts	Ch.5	77	2250	80	2380	Interesting thinking in this section. As visions on sustainable development are used, this is quite broad, and not focussed on biodiversity and ncp's. In particular, a vision is lacking for a pathway for the narrative 'Nature for itself'. See for example the Rewilding initiatives (in the PBL Nature Outlook study we call this narrative Allowing Nature to Find its Way.) I would add that pathway. The pathway can be combined with the other pathways, to various extents. The Low Carbon pathway (climate/energy focus) can be skipped and be integrated in the Green Economy pathway.	The idea of "Nature for itself" is perhaps best included in the land sparing. We decided not to merge Low Carbon Transformation and Green Economy pathways because 1) their intents are different, and 2) their nature / NCP / QoL outcomes are different - in the case of LowC_ in particular
The Netherlands: Astrid Hilgers	Ch.5	77	2250	80	2380	Interesting thinking in this section. As visions on sustainable development are used, this is quite broad, and not focussed on biodiversity and ncp's. In particular, a vision is lacking for a pathway for the narrative 'Nature for itself'. See for example the Rewilding initiatives. (In the PBL Nature Outlook study this is called narrative Allowing Nature to Find its Way.) On the other hand, the Low Carbon pathway (climate/energy focus) can be skipped and be integrated in the Green Economy pathway.	The idea of "Nature for itself" is perhaps best included in the land sparing. We decided not to merge Low Carbon Transformation and Green Economy pathways because 1) their intents are different, and 2) their nature / NCP / QoL outcomes are different - in the case of LowC_ in particular
Christian Schleyer	Ch.5	77	2250	81	2406	Please consider Priess et al. (forthcoming) for an excellent example of EU level scenarios with compelling narratives for ecosystem services provisioning and natural capital --> Priess, J.A., Hauck, J., Haines-Young, R., Alkemade, R., Mandryk, M., Veerkamp, C., Gyorgyi, B., Dunford, R., Harrison, P., Dick, J., Keune, H., Kok, M., Kopperoinen, L., Lazarova, T., Maes, J., Pataki, G., Preda, E., Schleyer, C., Vadineanu, A. & Zulian, G. (forthcoming): Lookout on Europe's ecosystem services and natural capital: new EU-level scenarios until 2050. Ecosystem Services.	Thank you! We have now included this contribution in the exploratory scenarios section 5.2.
ECA values liaison group	Ch.5	79	2322			Please replace the term "biodiversity and ecosystems" by "nature" if relevant - to align with IPBES CF and the other chapters	The section has been thoroughly revised and terms made consistent with the IPBES CF where appropriate
Henk van Zeijts	Ch.5	82	2407	whole section		More information from the PBL Nature Outlook study could be added, but this need some exploration, as the four perspectives by PBL do not have a perfect fit with the four pathways in the ECA report.	We have now included more information on the outlook in Box 5.11.
Henk van Zeijts	Ch.5	82	2413			Actually I don't see why there is so much focus on 'bottom-up' in the Transition movement approach, as transitions need changes at all scales (also institutional changes at international level).	The idea of the narratives is that they have certain key characteristics (quite similar to the idea of archetypes). The key characteristic of the Transition Movements is that change happens "bottom-up".
ECA values liaison group	Ch.5	82	2414			Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	The section has been thoroughly revised and terms made consistent with the IPBES CF where appropriate
Henk van Zeijts	Ch.5	82	2421	82	2423	Making room for cultural landscapes (attractive for recreation) and for habitat for pollinators and predators for natural pest control, will decrease total crop production in the EU, according to the normative scenarios (perspectives) Strengthening Cultural Identity and Working with Nature (Prins et al., 2017).	Thank you, we have included your notion now in the pathways section.
Henk van Zeijts	Ch.5	82	2447			Here Van Zeijts et al., 2017 and Prins et al., 2017 could be added, as rewilding and cultural landscapes is mentioned in these studies too as highly conflicting.	The reference is now added
Henk van Zeijts	Ch.5	83	2452	83	2485	I suggest to skip this section, as seems to be too generic, little added value to the rest.	We have revised this section and hope that it now provides added value. We have also included Box 5.11, with the PBL study mentioned to further illustrate this point.

Christian Schleyer	Ch.5	83	2452	83	2485	Please consider Hauck et al. 2017 as an innovative example of combining EU level storylines and quantified drivers with an assessment of the impacts of the scenarios on land-use change and subsequently biodiversity and ecosystem services change on EU level using the CLIMSAVE and IMAGE-GLOBO models, and with concrete policy options (EU, National, Regional) --> EU FP7 OpenNESS Project Deliverable 2.5, Hauck, J., C. Schleyer, J.A. Priess, R. Haines-Young, P. Harrison, R. Dunford, M. Kok, J. Young, P. Berry, E. Primmer, C. Veerkamp, G. Bela, A. Vadineanu, J. Dick, R. Alkemade, and C. Görög, Policy Scenarios of future change. European Commission FP7, 2017.	Thank you for point out this material. As the study is dealing with exploratory scenarios, we have included it now in sections 5.2.
Markus Fischer	Ch.5	83	2486			Rather: Options for dealing with, or so.	We have now rephrased to "5.5.6 Addressing trade-offs by mainstreaming and cross-scale integration"
Henk van Zeijts	Ch.5	83	2486			In general, this chapter seems to be very much pre-occupied with solutions to trade-offs. Whereas the ECA report should also show the wicked problems, that are hardly solvable and require political choices.	We have now not only in the pathways section but also in the section on exploratory scenarios tried to show that there are trade-offs, some of them can be solved, some of them will remain and require political choices.
Christian Schleyer	Ch.5	83	2486			Please consider Schleyer, C., Görög, C., Hauck, J. & Winkler, K.J. (2015): Opportunities and Challenges for Mainstreaming the Ecosystem Services Concept in the Multi-level Policy-Making within the EU. <i>Ecosystem Services</i> 16: 174-181 ( <a href="http://dx.doi.org/10.1016/j.ecoser.2015.10.014">http://dx.doi.org/10.1016/j.ecoser.2015.10.014</a> ) for a description of the challenges related to cross-sectoral integration in the context of mainstreaming ecosystem services in the EU policy making context	We have included the reference now when we discuss mainstreaming and cross-scale integration in section 5.5.7
Christian Schleyer	Ch.5	83	2486			Please consider Bouwman, I., Schleyer, C., Primmer, E., Winkler, K.J., Berry, P., Young, J., Carmen, E., Špulerová, J., Bezák, P., Preda, E. & Vadineanu, A. (2017): Adoption of the Ecosystem Services concept in EU policies. <i>Ecosystem Services</i> (Online available: 11 March 2017) ( <a href="http://dx.doi.org/10.1016/j.ecoser.2017.02.014">http://dx.doi.org/10.1016/j.ecoser.2017.02.014</a> ).	We have included the reference now when we discuss mainstreaming and cross-scale integration in section 5.5.7
Henk van Zeijts	Ch.5	84	2501	84	2503	(see for example European nature in the plural. Van Zeijts et al., 2017);	Thank you! We have now included your work as a reference.
Mark Rounsevell	Ch.5	84	2505			The Brown et al (2016) paper cited above explicitly explores the trade-offs in achieving the Volante visions	Thank you! We have now included the paper as a reference.
ECA values liaison group	Ch.5	86	2603			Add an analysis of values for the Models section	This is done in Figure 5.15.
Ben ten brink	Ch.5	86	2604	86	2615	These two paragraphs seems to say different things as the main task of Chapter 5. Isn't it the task of this chapter to answer the 4 key policy questions what is changing, why, is it important and what can we do about it?, especially for the future?	We have revised this section now according to the goals of our chapter stated in the introduction and as requested in the scoping document.
Markus Fischer	Ch.5	86	2606	86	2607	Reword; as stands it describes ch3, may be simply say interacting drivers and also make clear it is about future.	Reworded to emphasise that Chapter 5 focuses on all the interdependences between drivers, nature, NCP and QoL
ECA values liaison group	Ch.5	86	2613			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Changed
The Netherlands: Astrid Hilgers	Ch.5	86	2615	92	2838	It would be informative if answers could be given on ongoing discussions on intensifying or extensifying food production and impacts on B and ES, how to include foot prints outside the study area, whether biofuels for climate mitigation are beneficial or detrimental, whether forest plantations or multifunctional forests are beneficial to B and ES, what is the impact of conservation areas, stand alone and in combination with sector policies, wild capture fisheries or aqua culture, more or less meat consumption, is large scale soy production an alternative, whether free trade policies in food are positive or negative to B and ES in ECA and what are the trade offs in other world regions, what is the relative contribution of population growth, consumption and technology improvements such as efficiency of the use of water, energy, materials, and space? Without at least indications on which pathway(s) to go for each (sub) sector in support of B and ES it remains unclear what to do.	We have attempted to pull out many of these issues from the modelling studies and the pathway narratives, but we are limited by the information available from the literature reviews. Also definitive answers to this questions are not possible. We rather raise the issues that they entail, particularly focusing on trade-offs (cross-sector and cross-scale/inter-regional). We provide examples of such trade-offs related to intensification vs extensification, biofuels, forests vs agricultural land use, dietary change, etc. We also provide indications of how such trade-offs may be resolved depending on assumptions about drivers (such as population growth, consumption, technology, etc) in the different scenario archetypes.
Mark Rounsevell	Ch.5	86	2616			Perhaps comment on whether these six are appropriate and/or useful? For example, are there other plausible futures that are not covered by the six? Are these scenarios too conservative (based on conventional wisdom)? What might other plausible futures look like? Are the various scenario studies too 'incestuous', i.e. the fact that archetypes emerge could be interpreted as the various scenario studies simply copying one another.	The six scenario archetypes cover the scenario studies found for Europe and Central Asia well (i.e. we did not find any studies that could not be classified within these six). They are not predictions, but merely provide a diverse range of plausible futures in which "what if" questions can be explored. There are an infinite number of plausible futures, so some grouping is necessary to synthesise the findings. We prefer not to add a long discussion of these issues as the conclusions would become highly methodological, which other reviewers have asked us to avoid
Mark Rounsevell	Ch.5	87	2634	87	2635	No need to repeat the methods used here (and elsewhere in the conclusions section).	We have now considerably shorted this, but left a sentence or two in case some readers prefer to jump to conclusions.
ECA values liaison group	Ch.5	87	2634			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Changed
ECA values liaison group	Ch.5	87	2636			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Changed
Jean-Paul Hettelingh	Ch.5	87	2657	88	274	This section is an incomplete summary of the application of IAMs. The GAINS model is an IAM which focuses on the relationships between drivers of air pollution and climate change and impacts on human health and the environment. The latter includes bio-geochemical processes e.g. related to excessive nutrient input and acidification and their impacts. Many of these linkages have been addressed in chapter 4. It is recommended, as stated before, that consistency between the chapters in general, and 4 and 5 in particular be kept in mind. By doing so, this excellent study will be of great operational value for the future of integrated policies in the field of nature, climate change and air pollution.	This has been omitted as the section has been shortened and focused on policy relevant results. A more detailed summary of IAMs is provided in IPBES Deliverable 3c on Scenarios and Models
The Netherlands: Astrid Hilgers	Ch.5	87	2657	88	274	This section is an incomplete summary of the application of IAMs. The GAINS model is an IAM which focuses on the relationships between drivers of air pollution and climate change and impacts on human health and the environment. The latter includes bio-geochemical processes e.g. related to excessive nutrient input and acidification and their impacts. Many of these linkages have been addressed in chapter 4. It is recommended that consistency between the chapters in general, and 4 and 5 in particular be kept in mind. By doing so, this study will be of great operational value for the future of integrated policies in the field of nature, climate change and air pollution. For more information on the GAINS model, see <a href="http://www.iiasa.ac.at/web/home/research/researchPrograms/air/GAINS.en.html">http://www.iiasa.ac.at/web/home/research/researchPrograms/air/GAINS.en.html</a>	This has been omitted as the section has been shortened and focused on policy relevant results. A more detailed summary of IAMs is provided in IPBES Deliverable 3c on Scenarios and Models
ECA values liaison group	Ch.5	88	2674			Please replace the term "ecosystem services" by "nature's contributions to people" if relevant - to align with IPBES CF and the other chapters	Changed
ECA values liaison group	Ch.5	88	2674			Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	Changed
Germany	Ch.5	88	2675	88	2687	"potentially important drives". Please refer here to the findings of chapter 4. If possible please make more nuanced statements based on the analyses and insights of chapter 4	We have omitted this paragraph now.
Mark Rounsevell	Ch.5	88	2676	88	2677	But also because there is a lack of understanding of these processes and how to represent them in models	We have omitted this paragraph now.
ECA values liaison group	Ch.5	88	2678			Please replace the term "biodiversity and ecosystems" by "nature" if relevant - to align with IPBES CF and the other chapters	We have omitted this paragraph now.

ECA values liaison group	Ch.5	88	2681		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	88	2685		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	88	2690		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	88	2691		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
Mark Rounsevell	Ch.5	89	2718		Delete 'developments of'?	Section omitted
ECA values liaison group	Ch.5	90	2766	92	2838 Knowledge gaps are described, but it would be good to highlight some of the implications of these gaps.	The section on knowledge gaps has been restructured to focus first on knowledge gaps and their implications across all the sections of Chapter 5 and then to focus on knowledge gaps that are specific to each section and the implications this has for the findings from each review
Mark Rounsevell	Ch.5	90	2767	90	2770 No need to repeat the methods	This has been deleted
Mark Rounsevell	Ch.5	90	2779	91	2780 Yes, but note that this was formulated differently above (see previous comment)	Previous paragraph has been omitted. Here we focus on the gaps.
ECA values liaison group	Ch.5	91	2790		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
Mark Rounsevell	Ch.5	91	2792		I think there needs to be some statement here about the knowledge gaps associated with model and data uncertainties, as discussed in previous comments.	Added to the paragraph describing knowledge gaps in relation to the review of integrated models
ECA values liaison group	Ch.5	91	2793		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	91	2806		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	118	3823		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	119	3831		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	119	3841		Please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	This section has been shortened and revised, but the term "wellbeing" has been replaced by "good quality of life" where appropriate
ECA values liaison group	Ch.5	121	3847	126	3873 In appendix 5.5.1, please replace the term "wellbeing" by "good quality of life" if relevant - to align with IPBES CF and the other chapters	The language of the electronic appendices has been made consistent with the IPBES CF where appropriate
Henk van Zeijts	Ch.5	127	3890		(Van Zeijts et al., 2017; Prins et al., 2017) could be added to References in first and third table rows Green Economy (which is Working with Nature in PBL Nature Outlook)	Thank you, we have added the reference now
Henk van Zeijts	Ch.5	128	3893		(Van Zeijts et al., 2017; Prins et al., 2017) could be added to References in first table row Eco-topian solutions (which is comparable with Strengthening Cultural Identity in PBL Nature Outlook); sense of place and relational values belong to this, too; I think this is missing in the description.	Thank you, we have added the reference now
Henk van Zeijts	Ch.5	129	3884	130	3884 (Van Zeijts et al., 2017; Prins et al., 2017) could be added to References in Transition Movements Rows (which is comparable with Working with Nature in PBL Nature Outlook, although this perspective is not solely bottom-up).	Thank you, we have added the reference now