Comment form for 2nd Review Phase of IPBES Deliverable 3c) Fast-track methodological assessment on scenarios and models Chapter 1 'Overview'

Review Editor: Beth Fulton
Institute: CSIRO
Address: GPO Box 1538, Hobart, Tasmania 7001, Australia
Email address: beth.fulton@csiro.au

Review Editor: Carlos Joly
Institute: State University of Campinas/UNICAMP
Address: Cidade Universitária "Zeferino Vaz", Barão Geraldo - Campinas, São Paulo, Brasil
Email address: cjoly@unicamp.br

Reviewers:

Eyüp Yüksel,
Mahmood Yekeh Yazdandoost
Patricia Balvanera
Cinzia Gravili
Alan Feest
Jason Link (Review full report)
Geoff Hicks
Marina Rosales Benites de Franco
Peter Bridgewater
Derek Tittensor (Review full report)
Michael Bordt
German government
Nicolas Viovy
Diego Pacheco
PS Bhatnagar
Sandra Luque
Thomas Brooks
Marie Stenseke
Jamal Ahmad Khan
David Cooper
Christine Michel, DFO
Ram Pandit
Carolyn Armstrong
Louise Ann Gallagher
Carina Wyborn
UK government
Melanie Paschke
Yann Clough
Shane Orchard
Paula A Harrison
Spencer Thomas
Brenda McAfee

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
1	1	General	0	0	0	In general the document is still hard to read. The use of bullets, summaries of paragraph and very simple easy toe read key messages per sections would be needed.	Patricia Balvanera	Chapter has been substantially reorganized to address this issue. Now includes text highlight boxes throughout, conveying easy-

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								to-read key messages.
2	1	General	0	0	0	I suggest avoiding the framing As described in… but rather make the statement and in parenthesis refer to the respective IPBES document or section of this deliverable	Patricia Balvanera	Now avoided wherever possible.
3	1	General				The chapter seems very well written and a good clear introduction. I have (always!) some doubts about some of the exact terminology used, but this will become refined over the life of ipbes, so I am not worried at this stage.	Peter Bridgewater	Thanks
4	1	General				- document and chapter layout seemed appropriate for scope. Flow of ideas good overall with end of chapter 4 and beginning of chapter 5 perhaps needing some additional work/ realignment for clarity in this respect. - some repetition across sections though hard to avoid in a document such as this seeking to be comprehensive.	Shane Orchard	Thanks – also, Chapters 4 and 5 now much more strongly linked and aligned
5	1	General				Overall: Chapter 1 has been simplified nicely since the First Order draft and is now clear and concise with less repetition. It should meet its target lay-person audience well. Addition of the graphic in Table 1.1 showing how the IPBES deliverables relate to each other is good, could be earlier in the chapter perhaps. Three key messages are appropriate and conclude chapter well.	Shane Orchard	Thanks
6	1	General				General: I found this chapter rather long. It repeats a lot from the other chapters which seems unnecessary as the SPM should pull this together and Chapter 1 should simply set the scene and include the key definitions to which all other chapters then refer (rather than adding their own). I would recommend making it shorter and punchier.	Paula A Harrison	Chapter now shortened substantially, by reorganizing section structure and removing repetition
7	1	General				Chapter 1 does to a large degree relate to quantitative approaches, while little is said about qualitative models.	Marie Stenseke	Qualitative approaches now emphasised more in several places
8	1	General				**Chapters 1 and 8:** There is a lack of consistency in the use of natures' benefits to people vs ecosystem services between the two chapters. While chpt 1 uses natures' benefits to people, chpt 8 almost only talks about ecosystem services, without motivating why. According to IPBES conceptual framework and the Preliminary Guide for Diverse Conceptualisations of values, 'Ecosystem services' is asub-group of natures' benefits to people.	Marie Stenseke	Have tried to make it clear throughout Chapter 1 that "nature's benefits" include, but is not limited to, "ecosystem services". See

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								also Chapter 8's response to this comment.
9	1	General				**General** Models and scenarios can help to articulate our understanding of the world's ecosystems. The implications of this understanding both provide the critical rationale for the urgent development of virtual simulation 'games' (models and scenarios) with which to explore the possibilities of cultivating more sustainable futures. There is some confusion about what is termed 'types of models' which need clarification and consistent use throughout. The methodological assessment presented in this report focuses on models addressing three main links within the IPBES Conceptual Framework: - the effects of changes in indirect drivers (e.g. socio-political, economic, technological and 22 cultural factors) on direct drivers of change in, and therefore pressures on, biodiversity and ecosystems (e.g. habitat conversion, exploitation, climate change, pollution, species 1 introductions); 2 - the impacts of changes in direct drivers – both negative, and positive (e.g. through policy or 3 management intervention) – on nature, including various dimensions and levels of biodiversity, 4 and ecosystem properties and processes; and 5 - the consequences of changes in biodiversity and ecosystems for the benefits that people derive 6 from nature, and that therefore contribute to good quality of life (human well-being) – 7 including, but not limited to, ecosystem goods and services. Explain what models and scenarios are, tell us about the evidence supporting their use and then tell us about the barriers and biases that need to be overcome- and cover limitations of scenarios and models or you are guilty of bias in the argument by favouring modelling. It would be helpful to make the distinction between scenarios and models and how they can be used together. The subheadings switch between talking about models and scenarios. Uses of models are revealed to us slowly over several pages of long text- could this not be presented more succinctly as a table? The section on models should tell us what they are, give evidence supporting their use, tell us the benefits of using them, and then describe the 'types' or functions. Some mention should be made about data availability when writing about the variables. Notes about what IPBES should do, would be better placed in the messages instead of mixed into this text and various other places. There does not seem to be much mention of limitations of models, although there is a	UK govenment	Model typology now re-worked (in conjunction with other chapter teams) , and introduced more clearly in Ch 1. Models and scenarios now introduced and explained in a more logical sequence, and with less repetition, after major reorganization of section structure. All material dealing with scenarios now consolidated in one section (1.3). A section dealing with limitations of models has been added (Section 1.6). Target audiences,

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						long para on bias. A section on this, with the dealing with uncertainties would be helpful. There is little mention of reliance on assumptions in models and scenarios. The chapter would benefit from a subchapter about Scenarios. Chapter 1.2.3 Assessment and Decision Support Interface has very long text, p 115, lines 4-26 are about scenarios, line 28-34 is evidence about intervention scenarios, and 1.2.4 is about scenarios- surely it would be better to have a section about scenario uses and applications all in one place? Some statements are referenced and others are not, e.g. models with local knowledge and stakeholder engagement can increase accuracy etc. on p117- it would be better to support these statements with a reference or two. Case studies could be annexed- the section on model selection is a bit vague. You could give a short account of the case studies an how model selection proved useful- what determined which model/ scenarios were applied? High level messages are mainly targeted at IPBES. What are messages for policy makers? What could they gain by supporting this approach? These are messages for IPBES- what about a message that is for policy makers, or at least give a range of applications and benefits of uses of modelling and scenarios? Otherwise the case for application and investment is not very strong. Why would policy makers want to support this, what is in it for them?		within and outside IPBES, now clarified in introduction.
10	1	General				Satisfied with the chapter. No comments.	Yann Clough	Thanks
11	1	11	14	11	14	There is also “decision taking”, which leads to implementation. In fact its better as policy making, decision taking….. This may not be explicitly in other ipbes documents or materials but should be included in the chain of events.	Peter Bridgewater	This use of “decision making” conforms with that adopted in other key IPBES documents
12	1	13	1.4			This figure is very clear and I think ought to be in the SPM.	Peter Bridgewater	It was felt that this figure had too much detail for inclusion in the SPM (i.e. it would require too much explanation).
13	1	100				In general the Draft is quite detailed and aimed to be used by decision-makers. The	Eyüp	Target

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						importance of spatial correspondence is stressed. I see the eventual target bodies are decision-makers. Dimension is spatial, the tables are extremely complex. I do not agree with such an approach in preparing and submitting scenario. The fate of ecosystems and natural resources (Ecosystem Services, ESS), and their distribution in temporal and spatial dimensions do not mean for the decision-makers due to vote pressure of the public, namely the citizens who elect the governments, particularly in the developing countries. Therefore it would be better to simplify and shorten all the drafts of IPBES in the third run as they will probably again not influence decision-makers, even the public as all we belong to consumer society globally. Instead, ESS chemical, biological, biochemical, toxicological, nutrient, environmental chemistry on ESS, and their ecosystems they are provided by. No quantification, and no benefit-transfer required. The most influential role of IPBES work must be training of consumers by means of introducing simple, readable texts illustrated Models of consumers' behaviours are more applicable, implementable, important, and gainful compared to future situation scenarios for policy makers. The target group must not be policy makers, and decision makers, but the public, namely the consumers, millions of people. Scenarios must be coming from the past as majority assume scenarios for future is tentative, utopic, and fantastic as they also perceive them not reliable as the ordinary citizens and policy makers are not scientists thus not used to make assumptions.	Yüksel	audiences, within and outside IPBES, now clarified in introduction. Not clear what other changes are being suggested by these comments.
14	1	101	19	101	25	Qualitative description of relationships is missing.	Mahmood Yekeh Yazdandoost	"qualitative" is included in initial definition of "models"
15	1	101	40	101	40	Also organizing governance trends in intergovernmental issues.	Mahmood Yekeh Yazdandoost	This is a direct quote from an official IPBES document and therefore cannot be edited.
16	1	101	22			1.1, line 22 - it might be important to keep a focus on the important role of process / mechanistic models at this point in the chapter. This could be achieved by just dropping the word 'quantitative' in this line, or adding something about the role of process models in this paragraph.	Shane Orchard	"Quantitative descriptions of relationships" is intended to include process / mechanistic models.
17	1	101	38			Sentence beginning line 38, add ecosystem level diversity. Eg could end with ..." with	Shane Orchard	Not clear what sentence is

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						relatively few studies of genetic and ecosystem level diversity".		being referred to by this comment (there is no sentence starting at line 38 on page 101).
18	1	101	18			In the assessment is important to consider the incorporation of the assessment of scientific scenarios and models as well as indigenous and local knowledge scenarios and models (ILK) including the interscientific dialogue between scientific and all knowledge systems.	Diego Pacheco	ILK, and ILK-based scenarios and models, now addressed in several places throughout report (including in new Section 1.6). Also prominent in SPM.
19	1	101	34	102	4	This paragraph should be refelcted in the SPM	David Cooper	While this paragraph itself is not included in the SPM, most points within it are covered somewhere in the SPM.
20	1	101	27	101	32	Defining scenarios as "plausible representations… and/or alternative policy or management options" opens up to confusion and potential misinterpretations throughout the document. Could narrow down the definition to "plausible representations" for the current document, or clearly indicate where/when the term is used for policy/management options.	Christine Michel, DFO	The use of "scenarios" to refer to either plausible futures (i.e. "exploratory scenarios") or to policy options (i.e. "intervention scenarios") is now well accepted in the scenario

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								literature. The definition of, and subsequent distinction between, these two types of scenarios is now made even clearer in Chapter 1 and subsequent chapters.
21	1	101	27	101	32	Defining scenarios as "plausible representations… and/or alternative policy or management options" opens up to confusion and potential misinterpretations throughout the document. Could narrow down the definition to "plausible representations" for the current document, or clearly indicate where/when the term is used for policy/management options.	Christine Michel, DFO	Repeated comment – see previous response
22	1	101	27	41		Suggest that the double definition of scenarios as both plausible representations of the future and/or alternative policy options is confusing. Recomendation that it would be better to consider scenarios as plausible representaitons of the future and policy options as policy pathways that have different options or impacts across that range of plausible futures Suggest also adding to the definition that scenarios are designed to represent the range of uncertainty surrouding future change, and are not predictions of the 'best' or 'worst' cases, or a representaiton of the average of the two. People who are unfamiliar with scenario approaches often assume that if you average the presented scearnios you find the 'truth' somewhere in the middle.	Carina Wyborn	The use of "scenarios" to refer to either plausible futures (i.e. "exploratory scenarios") or to policy options (i.e. "intervention scenarios") is now well accepted in the scenario literature. The definition of, and subsequent distinction between, these two types of scenarios is now made even clearer in Chapter 1 and

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								subsequent chapters.
23	1	101	36			Delete 'synthesize', after observations add -it helps to understand past, current and future situations	UK govenment	This is a direct quote from an official IPBES document and therefore cannot be changed.
24	1	102	7		9	The statement starting “to strengthen.....” could not be more explicit in the anthropocentricity of the whole approach. No it is not the reason for IPBES it is the responsibility and moral obligation of preserving biodiversity that is the imperative which can be seen also as a self preservation necessity.	Alan Feest	This is a direct quote from an official IPBES document and therefore cannot be changed.
25	1	102	6	102	9	I suggest to include the following sentence or words highlighted in yellow: The most fundamental message emerging from this assessment is that scenario analysis and modelling can, and should, contribute significantly to achieving human wellbeing, lead us to live in harmony with nature, that is the overarching goal of IPBES “to strengthen the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development.	Marina Rosales Benites de Franco	The paragraph including this text has now been removed.
26	1	102	6	102	14	There is a danger that unbalanced focus on scenarios and models can lead to a misconception that decision makers no longer need to invest in data collection and maintenance – that can be replaced by cheap scenarios and models. So, it would be wise to supplement this paragraph by inserting between the first and second sentences (line 9) an additional sentence along the lines of “Such scenarios and modeling must complement (and indeed help to guide) renewed investment in the collection and maintenance of underlying data.”	Thomas Brooks	The paragraph including this text has now been removed. Have also added a subsection devoted to this issue in new Section 1.6 on Key Challenges.
27	1	102	25	102	4	Heinrichs and Kelly missign from ref list	David Cooper	Removed Henrichs and corrected Kelly
28	1	102	6	102	8	Another fundamental message in this report is that scenarios and models depend heavily on the quality of the data available, as discussed in Chap. 4. Suggestion is to include this important aspect up front as a key message.	Christine Michel, DFO	Added a subsection devoted to this issue in new Section 1.6 on

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								Key Challenges.
29	1	102				The use of model results could be addressed more fully. Given that the purpose of the report is "to provide expert advice on the use of such methodologies... to ensure the policy relevance" (p.102), it seems that the report focuses on the model development side but does not deliver on the model use side. It is great to have a model, it is better to have multiple models, but then what does the decision maker do with all the model outputs to inform a decision? This is particularly important when there are multiple models and/or multiple competing objectives.	Carolyn Armstrong	Chapter 1 now places more emphasis on this. Also addressed quite thoroughly in Chapters 2, 5, 7 and 8.
30	1	102	12			changed 'backed up' to supported	UK govenment	The paragraph that included this text now removed.
31	1	102	15			should be about the purpose, which is to guide IPBES activities	UK govenment	This purpose has now been made clearer.
32	1	102	21			does it outline an action plan, I thought it just gives recommendations for IPBES to consider	UK govenment	Changed wording as recommended
33	1	102	23			scientific community and policy makers and others	UK govenment	Changed wording as recommended
34	1	102	34			says it provides recommendations not an action plan	UK govenment	Agree. 102.21 changed, so now coherent
35	1	103	30			1.1.2: Regarding Background and context, in my opinion I think that it is important to mention the 11 descriptors of GES (Good Environmental Status) of the European Marine Strategy Framework Directive (http://ec.europa.eu/environment/marine/good-environmental-status/index_en.htm). These change the old approach that privileges the chemical-physical causes of possible malfunctions of the environment, disregarding their effects. The new Directive considers their effects on the living component: the state of biodiversity is the first descriptor of GES, and the second one concerns the impact of non-indigenous species on ecosystem functioning; the remaining nine require proper functioning of the ecosystem, linked to a good state of biodiversity (Boero, 2014a,b). **References:** Boero (2014a). GES revolution. Italian Journal of Zoology, 81(3). http://dx.doi.org/10.1080/11250003.2014.957024 Boero (2014b). The future of the Mediterranean Sea Ecosystem: towards a different	Cinzia Gravili	This is interesting, but much too specific for this introductory section.

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						tomorrow. Rend. Fis. Acc. Lincei. DOI 10.1007/s12210-014-0340-y		
36	1	103	6	103	13	Does the assessment do this? It is not evident from the SPM and Ch 1.	David Cooper	2 Items less well addressed have been removed from list.
37	1	103	41	104	2	I am not sure that this is a good reflection of the use of models in GBO4. The scenarios were used primarily to point out the feasibility of reaching the 2050 Vision, and, by implication, the 2020 Aichi targets.	David Cooper	Changed to focus on 2050 objectives
38	1	103	6			the scope finally tells us the objective, suggest this is moved up front and added to the SPM	UK govenment	Some description of definitions and purpose are required before outlining the scope, so position of text not changed.
39	1	103	15			also add to summary	UK govenment	There is no summary section for this chapter
40	1	104	8	104	10	Experience shows that successful application of models and scenarios to policy design, implementation and evaluation requires sustained interactions between stakeholders, managers, key decision makers and modellers.	Marina Rosales Benites de Franco	Ok, changed
41	1	104	Footnote			In the search terms (which include mammal diversity, insect diversity, and bird diversity), fishes are missing (which have more described species than mammals, amphibians, reptiles and birds put together). Amphibians and reptiles are also missing. Invertebrates are represented by 'insects', but how about all the marine invertebrate taxa? I know this analysis comes from a published study, but it would be easy to replicate, including additional terms, and extending to a more recent date (e.g. 2014).	Derek Tittensor	Search pattern has been reformulated and rerun for a more up-to-date analysis
42	1	104	15	104	15	May need consistency in the use of the terms "about" and "related to" which gives different connotations	Spencer Thomas	Changed to about
43	1.1.2	104	13	104	14	Please check, whether the labeling of the y-axis needs to contain the term "modeling". Reason: The search warrant represented in the footnote only refers to terms associated with scenarios and doesn't include "model" or something similar.	Germany	Axis title changed
44	1	104	13	104	17	**Figure1.1** already outdated, by the time the rapport will be published will not have much value action: FRB should update the trend towards 2015	Sandra Luque	Search pattern has been reformulated

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								and rerun for a more up-to-date analysis
45	1	104	4	104	5	In what sense are “global, regional and national environmental assessments” a kind of “decision context”? Also, what evidence do we have of “increasing use”? I recommend deleting this sentence, and the “In particular” at the beginning of the next one.	Thomas Brooks	The words "decision" and "use" were removed.
46	1	104	13	104	13	Why not plot the y axis of Fig 1.1 as proportion of biodiversity-related articles, rather than absolute number. This would be much more informative, given that the total number of articles has been increasing over the same period.	Thomas Brooks	The important point is that the absolute number of articles has risen from a very low level before the early 90's. That this has become a larger fraction of the total is a subsidiary issue.
47	1	104	8			starts telling us what makes models successful- again, this could be drawn into a summary table, because what makes models and scenarios successful has not been very well covered and should be.	UK govenment	These are now summarized (but not in a table) in the SPM
48	1	104	4		12	Why does the application of scenarios and models start with policy design, implementation and evaluation? In later part of the chapter as well as chapter 2 the application starts with the agenda setting? E.g. p 114 , line 39. There seems to be an inconsistency.	Melanie Paschke	This paragraph are intended to show that the role of scenarios and models in policy design, implementation and evaluation has most clearly been done at local to national scales. Contrast with previous paragraph.
49	1	105	21	105	29	Achieving a common understanding on the terminology is necessary before agreeing on any review framework. It is impossible to build a highly centralized structure (scenarios and models) whereby a specific group would take charge of following up the wide and	Mahmood Yekeh Yazdandoo	Agree. This chapter provides precisely this

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						interlinked assessment of progress.	st	terminology which is followed throughout the assessment. Unsure what action was being requested.
50	1	105	31	105	34	Also landscape heterogeneity, connectivity, structural complexity and aquatic ecosystem integrity.	Mahmood Yekeh Yazdandoost	Added "habitat modification" as a catchall term for these.
51	1	105	33			For many parts of the world (and where we have the greatest knowledge) the major driver of biodiversity loss is nitrogen deposition.	Alan Feest	Added "pollution" (sensu MA 2005) to list.
52	1	105	39			The implication is that this balance is wrong but in view of the “pivotal” place of species it is in fact a correct way forward.	Alan Feest	This depends on the decision context. Therefore the current bias does pose problems for broader use.
53	1	105	22		23	We endorse the urgent development and application of a common set of scenarios and models as they provide a clear homogenous analysis that may be easier for non specialist to understand.	Geoff Hicks	This section does not provide recommendations. This particular recommendation is reflected in the SPM.
54	1	105	24			But there has been a huge amount of work on extending the IPCC SRES scenarios to cover different spatial and temporal scales. This work is also now starting with the SSPs.	Paula A Harrison	Modified sentence to make clear that this was referring to past use of scenarios in IPCC
55	1	105	43			There should be models and scenarios for eco-system functions in the past along with the present. This will give a greater insight about ecosystem functions over a temporal scale	PS Bhatnagar	Added text to this

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						for a given geographic area.		
56	1	105	1	105	1	The science behind scenarios is young, yes. Models – not really – models in biodiversity go back 50 years or more. I'd delete "and models" from this sentence. Actually, it would be useful to add a paragraph, immediately before this one, to summarize and discuss the long history of modeling biodiversity and ecosystem services.	Thomas Brooks	The model and scenarios sections provide some of this historical background. There is a need to keep this section short, so this has not been added here
57	1	105	1	105	3	"first global assessment" true? What about Sala et al?	David Cooper	This text has been removed. But Sala et al. not really and assessment, more a study.
58	1	105	9	105	29	This typlogy is different from the one presentd in the SPM. Probably there are more "diemnsions" to the typology, and they need to better elucidated. There are also differences between story line scenarios (eg MA, GBO3) and backcasting scenarios (eg roads from Rio, GBO4) that needs to be pointed out. The whole typolog question needs to be reworked and presented in a clear and consistent manner. Currenlty its is all over the palce and not very helpful.	David Cooper	This is not a scenarios and model typology (which comes in a later section). This is focusing on the use of a single common framework vs. review of existing literature.
59	1	105	25	105	29	"the advantage …. " They also make use of a wider range of evidence	David Cooper	Ok, added to text
60	1	105	32	105	34	strong bias to terrestiral; freshwater and marine under-represented. This point should be reflected in the SPM	David Cooper	Ok, added to SPM
61	1	105	32	105	34	strong bias to cliamte change driver/longer term; other dirvers/medium term under-represented. This point should be reflected in the SPM	David Cooper	Ok, added to SPM
62	1	105	38	105	39	few studies on genetic level. This point should be reflected in the SPM	David Cooper	Ok, added to SPM
63	1	105	31		43	Could make this para much more succinct, and list the biases- this should go in a section about limitations of models and scenarios, which seem to be missing	UK govenment	This text now moved to

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								Section 1.6, dealing with current limitations of scenarios and models.
64	1	105	1		7	These lines would be better placed in the introduction- they help indicate growing interest and uses of models	UK govenment	These lines moved up towards beginning of section 1.1.2
65	1	106	15			No Diaz does not provide a logical starting point and see Maier and Feest (in press) for a complete destruction of the reasoning in Diaz. Contact Don Maier for a prepublication copy for internal use.	Alan Feest	IPBES uses work explained in Diaz et al. as a conceptual framework. Because of the intergovernmental nature of this process, IPBES assessments must use this as a basis for their work unless modifications are adopted by the Plenary.
66	1	106	6	106	6	production and carbon storage, even though other types of ecosystem services, including the benefits of new research findings and negative impacts of biodiversity (eg. Ebola and MERS) are key elements in	Jamal Ahmad Khan	The list of other ecosystem services is too long to put here. See chapter 5 for more details.
67	1	106	15	106	24	The IPBES CF is itslef a simple model, no? should this be pointed out?	David Cooper	Yes, this has now been pointed out, early in Section 1.2.
68	1	106	7		8	another objective has appeared here. Would be good to put all objectives at the start of the document?	UK govenment	Sentence on objectives removed.

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69	1	106	16		17	within the context of IPBES? I thought it was for policy makers?	UK govenment	Target audiences, within and outside IPBES, now clarified in introduction.
70	1	107	Fig 1.2			Again the biodiversity box needs to be bigger and how are intrinsic values to be measured. How are values such as rarity to be measured?	Alan Feest	Nature box (including biodiversity) now bigger. Intrinsic values are addressed in Section 1.5.1, and response variables relating to biodiversity covered in depth in Chapter 4.
71	1	107	18			1.2, line 18 - the concept of replacing conceptual links with models might imply an oversimplification (ie since these links are seldom standalone models and the conceptual set of relationships is itself a model). Perhaps change "Replacing these conceptual links with models" > "developing methods to quantify these links allows ... ". This could help keep the focus on the specific requirement and point being made. Suggest follow in line 20 with "The methodological assessment presented in this report focuses on *modelling approaches to address* three main links within the IPBES Conceptual Framework"	Shane Orchard	Good point. Revised text: "The arrows linking elements in this framework therefore collectively constitute a conceptual model. Replacing these conceptual links with more quantitative descriptions of each of these relationships allows observed, or projected, changes in the

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								state of one element to be used to estimate, or project, resulting changes in other elements."
72	1.2.1	107	3	107	3	The term "IPBES analytical Conceptual Framework" might suggest that another framework is meant here other than the "IPBES Conceptual Framework".	Germany	Removed "analytical"
73	1	107	1	107	5	Figure 1.2.: The word **Nature** should be there.	Jamal Ahmad Khan	"Nature" is already included prominently in this figure
74	1	107	6	106	6	harmony with nature." In the main panel, delimited in grey, "nature",	Jamal Ahmad Khan	Not clear what this comment is referring to.
75	1	107	7	106	7	"nature's benefits to people", "nature's threat to people and all other organisms" and "good quality of life" (indicated as blank headlines) are inclusive of all these	Jamal Ahmad Khan	Not clear what this comment is referring to.
76	1	107	20		21	some confusion about what have been termed types of models,, but now it is models addressing 3 main links within the IPBES framework- better decide what to call them and stick with it.	UK govenment	"Models" now defined more clearly in text highlight box at start of chapter, and "types of models" defined more clearly in Section 1.2.2
77	1	108	Fig 1.3			Nature box size again	Alan Feest	Nature box enlarged.
78	1	108	19	108	21	In the graph there is a biased reference to the conceptual framework since only the concepts of science (in green) are introduced ignoring the concepts of knowledge systems (in blue). Therefore when mentioning to Good quality of life: human well being and LIVING-WELL IN BALANCE AND HARMONY WITH MOTHER EARTH should be included; also in nature's benefits to peoples in addition to ecosystem goods and services, also NATURE'S GIFTS should be included. Finally, when mentioning Nature also biodiversity and ecosystem and concetps of MOTHER EARTH AND SYSEMS OF LIFE should be included. Otherwise, we have a biased understanding of the conceptual framework only towards science which is not the purpose of IPBES.	Diego Pacheco	Full conceptual framework, conveying all terms and concepts, is included in Fig 1.2. And following now added to caption of Fig 1.3: "see Figure 1.2; but

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								note that in the current figure, due to space constraints, elements are translated only into terms commonly used in the scientific literature, e.g. "Nature" into "biodiversity & ecosystems", and terms used in other knowledge systems are not depicted"
79	1	108	19	108	19	The grey box in Fig 1.3 for "Assessment and decision-support interface" should be separated into two, and arrows incorporated from the blue "scenarios & models" box up and down through "Assessments", through "Decision-support interface", and directly. This is because, as noted in the legend (lines 21-22) scenarios and models can inform and be informed by policy through assessments (without necessarily including decision-support interfaces), through decision-support interfaces (without necessarily including assessments), and directly (without either assessments or decision-support interfaces).	Thomas Brooks	This is a good suggestion, and is currently being considered as part of interactions with the IPBES graphic designer working on improving this figure for the SPM.
80	1	108	19	108	19	Ecosystems are part of biodiversity; it is a tautology to say "biodiversity and ecosystems". In the bottom box in Fig 1.3, please either say "Biodiversity, encompassing genetic, species, and ecosystem diversity" or similar, or else simply "Biodiversity".	Thomas Brooks	The use of "biodiversity and ecosystems" throughout this report is based directly on the IPBES Conceptual Framework, where

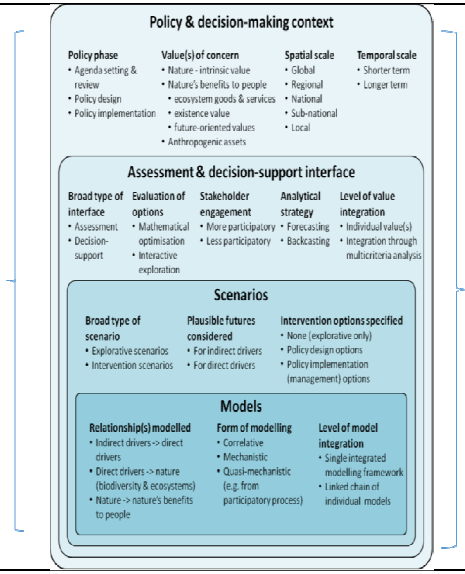
№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								"biodiversity and ecosystems" are used to denote the scientific conceptualizatio n of "Nature". Also, following the CBD definition only the variability of ecosystems is part of biodiversity, not the ecosystems themselves. This will be clarified in the glossary.
81	1	108	13	108	13	modeling of impacts of indirect socio-economic drivers both on knowledge of completeness of known biodiversity/unknown biodiversity under continuous study/research, nature's benefits to people, nature's threats to people, people's response/role in sustaining the existence of diversity in future too, and on	Jamal Ahmad Khan	Not clear what change is being suggested by this comment.
82	1	108	1			types of models is not quite right, functions or purposes might be better	UK govenment	Not clear what this comment is referring to. Line 1 on page 108 does not include "types of models".
83	1	108	17		18	A use of models buried in text	UK govenment	This use of models now discussed in more detail, and more prominently, in Section 1.4.3
84	1	109	11	109	13	Integrated policy must create space for flexibility and innovative collaboration towards sustainability.	Mahmood Yekeh Yazdandoo	Not clear what change is being suggested by

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
							st	this comment.
85	1	109	41	109	42	Scenarios and models play different, but highly complementary, roles in informing, planning and supporting policy and decision-making	Marina Rosales Benites de Franco	"informing and supporting" encompasses planning implicitly
86	1	109	38	109	38	"should" is too prescriptive here; replace with "might".	Thomas Brooks	This text now removed.
87	1	109	1	109	1	"All three types …" which 3 types. Again, not clear!	David Cooper	This text now removed.
88	1	109	23	109	39	SPM does not capture these points well	David Cooper	These points now captured prominently in Key Finding 1.2 of SPM.
89	1	109	23	109	39	"… two main roles..". What about "backcasting" as in Roads from Rio/Gbo4?	David Cooper	Backcasting is a specific technique for implementing goal seeking. This is now clarified in Section 1.3.2.2
90	1	109	23	40		See above comment, despite the clear distinctions between the way that scenarios are used and discussed within the literature, some of the confusion found in their use – and a limiting factor in their general uptake as a decision-making tool emerges from this range of different approaches. It would be useful for IPBES and IPCC to come to some shared conclusions about the scenario approaches that will be used to support the two assessments and ensure consistency across them.	Carina Wyborn	Good point. This issue now addressed in SPM, and in Chapters 3 and 8.
91	1	41		109		starts to describe scenarios vs models, and should be up front more as that is what this work was about!	UK govenment	Respective roles of scenarios and models now introduced in more logical order, following major section restructuring.
92	1	109				creeps from models to scenarios, and stats telling us what makes models successful- again, this could be drawn into a summary table	UK govenment	Respective roles of scenarios and models now introduced in

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								more logical order, following major section restructuring.
93	1	109	19			change 'dealing with reality' to usefulness in exploring past present and many possible futures.	UK govenment	This text now incorporated into a fully revised section (1.3) devoted to explaining the role of scenarios.
94	1	109	10		11	delete	UK govenment	Not clear why this should be deleted.
95	1	109	19		21	move to start the paragraph	UK govenment	This text now incorporated into a fully revised section (1.3) devoted to explaining the role of scenarios.
96	1	109	41		43	should be moved to where scenarios are defined	UK govenment	This text now incorporated into a fully revised section (1.3) devoted to explaining the role of scenarios.
97	1	109	1		2	change to :the three modelling purposes require …	UK govenment	This text now removed as part of section restructuring.
98	1	109	3		4	what is the first of the two elements of interest, do you mean the links with IPBES conceptual framework?	UK govenment	Yes – now made clearer in revised section dealing with this.
99	1	110	12		13	The sentance Modelling ..... Needs to be in bold!	Alan Feest	Now given

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								more prominence in a subsection devoted to this issue, within Section 1.6.
100	1	110	1		21	should be moved to where scenarios are defined	UK govenment	Done.
101	1	110	10		12	a limitation or a requirement to use models?	UK govenment	Now clarified in a new subsection devoted to this issue, within Section 1.6.
102	1	110	13		16	another use of modelling buried in text	UK govenment	Now made clearer as a result of section restructuring.
103	1	110	34		38	I don't think scenarios and models goes here or in the next subsection.	UK govenment	Addressed by major section restructuring to improve logical flow of chapter.
104	1	110	13			delete elements	UK govenment	Deleted.
105	1	110	16			more elements, suggest delete and use 'phases'	UK govenment	Done as part of major revision of text introducing policy cycle phases.
106	1	110	30			another line about where modelling can benefit policy makers, they are scattered around and should be herded together is a short summary subsection at the start.	UK govenment	Good point – now addressed by major section restructuring to improve logical flow of chapter.
107	1	111				1.2.2.1 - Could introduce mention of the 'horizon scanning' concept here. eg. would fit in "Agenda setting and review" section.	Shane Orchard	Horizon scanning now introduced in Section1.3.2.1

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
108	1	111	36	111	42	The references to limitations regarding remote sensing data are outdated in the light of the new generations of very high resolution data. See for instance the Copernicus mission products and Sentinels products This topic is crucial for the data input needed for the models including free access to archives of temporal data. More importantly for the first time we are having a **Copernicus Data Policy: free and open access** to all Sentinel data: for more information **https://scihub.esa.int/** UPDATE and COMPLETE	Sandra Luque	Updated, with inclusion of two more recent references.
109	1	111	42	112	2	In the same way coupling modelling techniques using field data with remote sensing data should be highlighted. The reference from Ferrier 2011 is limited much more was produced in the last 3 years on the topic Weak and outdated UPDATE references and provide a more robust statement on the subject as is crucial for data input at all spatial and temporal levels	Sandra Luque	Updated, with inclusion of two more recent references.
110	1	111	41	106	41	Be observed only through direct field survey. Coupled with this, it is necessary to consider the extreme shortage of well qualified and technically competent people (taxonomists, ecologists, etc.), standardized field survey methods for maintaining global uniformity and fast changes in analytical tools, modeling methodologies and software advancements. Such data therefore tend to be sparsely and unevenly	Jamal Ahmad Khan	This detail not added, due to space constraints. It is covered in cited references.
111	1	111	21			add or finding opportunities to optimise nature's benefits to people	UK govenment	"opportunities" now mentioned.
112	1	111	33			another benefit of modelling	UK govenment	All benefits of modelling now consolidated in Section 1.2.
113	1	112	5	112	5	Important to add something like "relative to the distribution of people receiving these benefits" to the end of the sentence here (because otherwise these are not benefits, just ecological processes).	Thomas Brooks	Added.
114	1	112	12	112	14	Use "invasive alien species" rather than "species introduction"/"introduced species"	Thomas Brooks	Change implemented.
115	1	112	24		28	Should open this section, and be moved to line 8, p111	UK govenment	This now rewritten and relocated to Section 1.3.
116	1.2.2.1	113	1	113	1	Fig. 1.4 gives a good impression of the integrative relationsships between models and the policy context. This function should be highlighted and the relationships could be further visualized. Beside this, the structuring of the attributes should either be more self-explaining or be explained more comprehensivly in the figure description.	Germany	This figure now completely restructured to give this emphasis.
117	1	113	1	113	1	Replace the figure with the following:	Diego Pacheco	This figure has now been

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								completely reworked.
118	1	113	6			delete: Moving from assessing the need for action in agenda setting, to actual	UK govenment	This text now relocated and modified during section restructuring.
119	1	113	15			what is a 'high-level percentage-reservation target'?	UK govenment	Changed to: “a high-level target (e.g. 17% of terrestrial area, as specified by Aichi Target 11)”
120	1	114	20	114	27	This classification of values is not consistent with IPBES conceptual framework nor with the first verion of deliverable 3d.Utilitarian values are rather name instrumental values	Patricia Balvanera	Now cites, and adopts classification from, Deliverable 3d’s draft guide.
121	1	114	4	114	13	Important here to note that the ‘best solution’ needs tob e determined through participatory processes that consider the range of social and economic values people hold for a given area – the critical role of scenarios in this type of decision-process is to	Carina Wyborn	“best solution” being used here only in a

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						stimulate dialogue among different groups about the trade-offs and implications associated with different policy designs		mathematical optimization sense. The next paragraph emphasizes the importance of interactive dialogue with decision-makers and stakeholders.
122	1	114	3			simply sentence- in terms of…a, b, c	UK govenment	No clear what change is being suggested.
123	1	114	4			delete in relation to the above cases,	UK govenment	Change implemented.
124	1	114	11			change elements to phases, delete discussed in the previous subsection	UK govenment	Change implemented.
125	1	114	29			is this a role of modelling in the policy cycle?? Does not seem to fit well here, it is about an interactive function that helps bridge policy makers and modellers/analysts and what would be useful for IPBES considerations	UK govenment	Good point. This topic is now handled in its own high-level section (1.4), following treatment of models (1.2) and scenarios (1.3).
126	1	114	36			We get back to uses of scenarios	UK govenment	All discussion of uses of scenarios now consolidated in one section (1.3).
127	1	114	20	114	27	The values captured in this paragraph are illustrative only. Even then 'cultural' values are missing which are important values from both western and ILK perspectives. 'Cultural values' should be noted in line 26.	Ram Pandit	Now cites, and adopts classification (including cultural values) from, IPBES Deliverable 3d's

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								draft guide on values and valuation.
128	1	115	11			Optimisation may not always be the 'best' or most appropriate method, but rather an intervention that is robust to uncertain futures.	Paula A Harrison	Agree. Now changed to: "optimisation might be used to automate the search for an intervention, or set of interventions, that either maximises the expected outcome for nature or nature's benefits, or maximises the robustness of this outcome in the face of future uncertainties"
129	1	115	18	115	18	This means that concurrent monitoring/study/evaluation should be in place for providing inputs for formulating intervention scenarios, whenever required. The intervention scenarios must be formulated, and analysed, progressively throughout	Jamal Ahmad Khan	"progressively" is here referring to a shorter time frame than that addressed by monitoring/evaluation .
130	1	115	34	115	34	role of decision-support interface depicted in Figure 1.3. Any locale specific scenario may not necessarily be applicable to analyses at global and regional levels.	Jamal Ahmad Khan	Agree. This point is hopefully made clearly by the chapter – including in Section 1.5.
131	1	115	28			delete 'basic idea of'	UK govenment	This text now relocated and

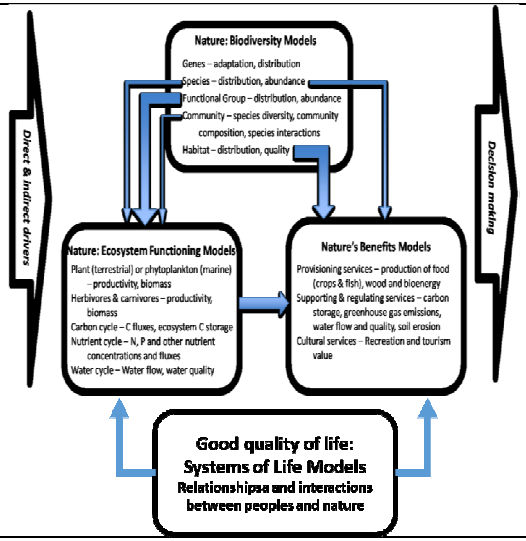
№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								revised during section restructuring.
132	1	116	40	116	40	In the assessment of scenarios is important to consider ILK scenarios based on the specific cultural understanding of the ecosystem functions and services including the consideration of all knowledge systems.	Diego Pacheco	This section of text now removed during restructuring.
133	1	116	36	116	36	restrictions, regulating the use of natural resources, etc. This means the "Consume with Care" should be accepted by everybody in our society. But, is it possible and can it be imposed very rigidly? Scenarios, in the sense that is used	Jamal Ahmad Khan	Text now removed during restructuring.
134	1	116	25	118	32	See general comment, suggest distilling this information into a table to provide clarity for readers on the different types, uses, strengths and limitations of different scenario methodologies	Carina Wyborn	The typology of scenarios now completely reworked, and presented more clearly in new Section 1.3.
135	1	116	10			now describing characteristics of some methodologies-surely this means another functional requirement of the interface? Or the model? Is the ability to aggregate.	UK govenment	Yes, agree. Hopefully now made clearer in revision of text in new Section 1.4.
136	1	116	41			uses of scenarios- I found it at last!	UK govenment	All discussion of uses of scenarios now consolidated in one section (1.3).
137	1	116	15	25		Participative scenarios and models are part of social learning processes, e.g. companion modeling – you might consider not only to emphasize the evaluation and joint knowledge production process but also the transfer into action with stakeholders.	Melanie Paschke	No clear which piece of text this is referring to (mix up with page numbers?) or what change is being suggested.
138	1	117	22			reference missing to support statement for likely to be much higher	UK govenment	Not clear which line this is referring to. But this whole block

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								of text now removed during revision and restructuring.
139	1	117	24			reference missing to support statement for accuracy	UK govenment	Not clear which line this is referring to. But this whole block of text now removed during revision and restructuring.
140	1	118	14	118	24	Integrated multi-sectoral strategy is expected to function effectively in cross-sectoral and multi-level settings with the aim to better integrate: horizontal dimensions across sectors, vertical dimensions across spatial scales and time-wise across short and long-term horizons.	Mahmood Yekeh Yazdandoost	This text now removed during revision and restructuring.
141	1	118	22	118	32	Mixes up scenarios and models so confusing. Is the focus on participatory scenario development or participatory model development? – they are not the same although there are examples where both have been considered together, but many more where they are considered separately.	Paula A Harrison	This text now removed during revision and restructuring.
142	1	118	14	118	14	The scenario development process involves a number of stages, which include: correct and updated knowledge of biodiversity and ecosystem services of the study areas and then consulting	Jamal Ahmad Khan	Not clear what change is being suggested.
143	1	119	33			BBNs can be based on more than expert knowledge. One of their strengths is that they can combine different types of inputs (empirical, expert, etc). This is explained in chapter 5.	Paula A Harrison	and Bayesian Belief Networks, where expert based knowledge can be combined with other types of information (Haines Young, 2011).
144	1	119	40			There are models that span all 3 categories. These are mentioned (repetitively) across the 3 chapters, but their strength in attempting to cover a systems approach is lost by this structure.	Paula A Harrison	In chapter 4 this has Here we added: In practice some models combine all three categories into

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								one integrated model. The three categories often are arranged as separate modules, within a model framework (e.g. IMAGE, CLIMSAVE etc.) This is also stated on page 121 line 23 and further
145	1	119	15	119	15	In the assessment of the models is important to consider ILK scenarios based on the specific cultural understanding of the ecosystem functions and services including the consideration of all knowledge systems.	Diego Pacheco	The use of ILK in models is addressed within the category "expert" based models, where ILK holders are considered experts on specific information
146	1	119	29	119	29	Add text to read "...or mechanistic models of extinction risk (e.g. Brook et al. 2000), or of ecosystem function..." The citation is Nature 404: 385-287.	Thomas Brooks	This might be mentioned as an example of the application of process based models,
147	1	119	26	119	33	A fourth category could usefully be recognized here, as "application of threshold approaches to represent underlying mechanistic relationships, e.g., protocols for extinction risk assessment (Mace et al. 2008)". The citation is Conserv Biol 22: 1424-1442. (Box 6.1 in Chapter 6 gives a good example of why this approach is so important to reflect here.)	Thomas Brooks	Threshold approaches are not models as such but are model applications. The model itself could be a

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								process based model in the category of 'driver impacts on biodiversity"?
148	1	119	36	119	36	approaches, but these may have difficulty in incorporating biological information and data from expert or indigenous and local knowledge	Jamal Ahmad Khan	Changed in , but these may have difficulty in incorporating biological data and information from experts or from indigenous and local knowledge holders compared to qualitative approaches
149	1	119	41	119	41	- Models projecting changes in direct drivers of biodiversity and ecosystems (e.g. ecological features of a species: autecology / synecology, land use	Jamal Ahmad Khan	Not a driver?
150	1	119	40			categories, types or linked to the IPBES framework?	UK govenment	Categories linked to the IPBES framework, see figure 1.3
151	1	120	7	120	8	Change "ecosystem carbon storage" (an ecological process) to "climate change mitogation" (an ecosystem service).	Thomas Brooks	Changed in: climate mitigation by increased ecosystem carbon storage
152	1	120	9	120	9	- Models assessing known threats of biodiversity and recently known threats of biodiversity (Ebloa, MERS, etc) - Models assessing the impacts of future possibilities of finding a gainful utility value from a highly economic species for the society through new techniques/tools.	Jamal Ahmad Khan	-These models (if they exist) are included in the category of models that describe Nature's

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								benefit, either by describing them as disservices or by a lack of disease regulating services - If these models exist they clearly are included in the category 'Nature's benefit models'
153	1	120		Fig.5		This figure makes a rather large – and incorrect – assumption that the existing models for evaluating nature's benefits arrive at estimations that are easily taken up into "decision-making". I would agree that if it's decision-making that requires specifically values to be articulated for categories of ES, then maybe it works. But how often is this the case?	Louise Ann Gallagher	The figure is not intended to describe this, Figure 1.3 gives more insights. Figure will be redrawn
154	1	121	18	121	20	Law and governance may help and also sometimes hinder the efforts in implementing the proposed IPBES program.	Mahmood Yekeh Yazdandoost	This is discussed in more detail in chapter 2 ???
155	1	121	2	121	2	The figure now depicts very clearly the kinds of models are available.	Patricia Balvanera	Thanks
156	1	121	Fig 1.5			These boxes are the right size but cultural relevance such as ethical, moral and religious context need to be added.	Alan Feest	Figure will be adapted
157	1	121				Figure 1.5 is at odds with Figure 1.3, which does not show models feeding directly into one another, or being linked, and shows them being separated by 'key elements in the IPBES conceptual framework.' Suggest reorganizing to bring it in line with Fig. 1.3, or removing.	Derek Tittensor	Figure will be adapted in accordance with figure 1.3
158	1.2.5.2	121	1	121	1	With regard to the typology of relevant models described in this section 1.2.5.2, fig. 1.5 is somewhat confusing because it introduces two other typologies/types: first, the model showing the relationship between direct and indirect drivers (left) and decision making (right) and second, the three kinds of models in the three central boxes.	Germany	Figure will be redrawn
159	1	121	1			Replace by the following figure:	Diego Pacheco	This is out of the initial scoping and

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								outline. We add: Another category is combining all aspects that determine 'good quality of life' in to a decision making context (examples in chapter 2; GISMO (Lucas & Hilderink, 2008))
160	1	121	1	121	1	In the Fig 1.5 box on "Nature: Biodiversity Models", in the "Species" row, add "extinction risk"	Thomas Brooks	Figure adapted
161	1	121	1	121	1	In the Fig 1.5 box on "Nature's Benefits Models", replace "carbon storage, greenhouse gas emissions, water flow and quality, soil erosion" with "climate change mitigation, provision of clean freshwater, soil protection". Again, this component is concerned with services, not processes.	Thomas Brooks	Figure adapted
162	1	121	22	121	22	- impacts on diversity and ecosystem services and their implications for human well-being as well as all other types of organisms, including microbes, plants and animals.	Jamal Ahmad Khan	This is included in the term 'biodiversity' (see glossary)
163	1	121	18	122	9	Some mention of the challenges of integrating and quantifying different types of knowledge within integrated models would be worthwhile here. This is one of the fundamental challenges of integrated modelling and assessments	Carina Wyborn	Added: Integrating different types of knowledge within IAM's is particularly challenging, but necessary to provide the links to human well-being, or quality of life,

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								or decision making (see e.g. De Vos et al., 2013).
164	1	121	1	121	5	This is a semantic but could become significant. Supporting services should be part of ecosystem functioning, and not 'nature's benefits'.	UK govenment	Figure will be adapted
165	1	121	18			another use of models	UK govenment	Uses of models now consolidated in Section 1.2.
166	1	122	29	122	29	Wrong citation Cheaib et al 2012 instead of Cheaib et al. 2010	Nicolas Viovy	Done
167	1	122	35	122	35	Such, the models need to be thoroughly tested with reliable and timely completeness of data and an evaluation of the strengths and	Jamal Ahmad Khan	Text removed during revision and restructuring.
168	1	123	13			Case studies: one showing the importance using scenarios and models to identify trade-offs and synergies between multiple ES under uncertainty would add value, e.g. Dunford et al. (2015). Ecosystem service provision in a changing Europe: adapting to the impacts of combined climate and socio-economic change. Landscape Ecology, 30: 443-461, DOI 10.1007/s10980-014-0148-2	Paula A Harrison	Good suggestion, but there is not sufficient space to add another case study, and the existing three may need to be reduced to two for the same reason.
169	1	123	14	129	10	Delete the case studies. It creates more complexity to understand the use of scenarios of models.	Diego Pacheco	Inclusion of the case studies has received favorable feedback from other reviewers.
170	1	123	7			very short bit on model limitations, having lured us to read as far as page 123. This needs to be more transparent, and covered in the general chapter about models.	UK govenment	This is expanded in the chapters, but added a few sentences here
171	1	124		128		All three examples are terrestrially focussed. Given that models are frequently used in fisheries decision-making processes, I suggest replacing one of these with a fisheries	Derek Tittensor	Good suggestion.

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						example.		Consideration is still being given to adding a marine case study. The third existing case study (Guyana) is already being dropped, due to space constraints.
172	1	124	12	125	23	The utopia of the RIO+20 scenarios was proven an intellectual exercise that is not providing solutions towards sustainability or mitigation measures. Then I was expected IPBES to provide a more operational position toward this type of Northern conceptualizations for scenario analysis. IPBES should focus on frameworks for scenario analysis that support concrete actions for planning. Provide a CRITICAL statement of the pathways towards targets provided by RIO+20 Otherwise there is a mismatch in between the cases study presented and this idealistic framework BE critical provide new insights!!!	Sandra Luque	Agree with this sentiment. But not clear what change to the chapter is being suggested.
173	1	124		Case studies		All of the case studies look only as far as modeling impacts on BES, and not the knock-on consequences of changing BES for economic and social outcomes.	Louise Ann Gallagher	Valid point, but no further case studies can be added due to space constraints.
174	1	124		127		Would be good to present these case studies with a similar format: the subtitles that are provided in the first case study are useful and direct the reader through the text and highlight the role of models/scenarios in supporting policy making	Carina Wyborn	This is now being done, working with IPBES's graphic designer.
175	1	127	3		3	Figure Box 2.1 should consider the Nature's threat to people	Jamal Ahmad Khan	This Box can only work with what was done in the original study (which didn't consider "nature's threat to people").
176	1	130	Fig 1-6	130	Fig 1-6	Key international laws and governance issues need to be identified, because it will assist parties and key institutions in their preparations for just and sustainable new	Mahmood Yekeh	These issues are beyond the

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
						commitments.	Yazdandoost	scope of this methodological assessment.
177	1	130		130		It would be useful to also have Figure 1.6 in the summary for policymakers, so that readers would know where to look if they wanted more detail.	Derek Tittensor	This was considered in planning the SPM, but inclusion was not considered appropriate, partly due to space constraints.
178	1	130	11	130	13	In the graph there is a biased reference to the conceptual framework since only the concepts of science (in green) are introduced ignoring the concepts of knowledge systems (in blue). Therefore when mentioning to Good quality of life: human well being and LIVING-WELL IN BALANCE AND HARMONY WITH MOTHER EARTH should be included; also in nature's benefits to peoples in addition to ecosystem goods and services, also NATURE'S GIFTS should be included. Finally, when mentioning Nature also biodiversity and ecosystem and concetps of MOTHER EARTH AND SYSEMS OF LIFE should be included. Otherwise, we have a biased understanding of the conceptual framework only towards science which is not the purpose of IPBES.	Diego Pacheco	Full conceptual framework, conveying all terms and concepts, is included in Fig 1.2. And following now added to caption of Fig 1.3 (which is cross-referenced in the caption of this figure): "see Figure 1.2; but note that in the current figure, due to space constraints, elements are translated only into terms commonly used in the scientific literature, e.g. "Nature" into "biodiversity & ecosystems",

№	Chapter	From page	From line	Till page	Till line	Comment	Reviewer Full Name	What was done with the comment
								and terms used in other knowledge systems are not depicted"
179	1	130	12	130	12	The grey box in Fig 1.6 for "Assessment and decision-support interface" should be separated into two, and arrows incorporated from the blue "scenarios & models" box up and down through "Assessments", through "Decision-support interface", and directly. This is because, as noted in the legend (lines 21-22) scenarios and models can inform and be informed by policy through assessments (without necessarily including decision-support interfaces), through decision-support interfaces (without necessarily including assessments), and directly (without either assessments or decision-support interfaces).	Thomas Brooks	This is a good suggestion, and is currently being considered as part of interactions with the IPBES graphic designer working on improving this figure for the SPM.
180	1	131	20	131	23	Not only the values of people involved in decision making processes or the values derived from nature, but also the "valuation process" by which values are elicited needs to be recognised. Different valuation methods (e.g. economic, ILK, biophysical, social etc.) may elicit some over lapping values but also they elicit different values to people. Some methods allow for up-scaling of values at different scales for decision making context (local to regional, for example), others may not be easily aggregated. In addition strengths and weaknesses of these methods should also be considered in a decision making context.	Ram Pandit	Good point, but probably too much detail for this part of the chapter, and report.
181	1	132	13	132	14	Many countries plan to reform their laws and institutions across diverse economic, environmental and social sectors in order to adress the challenges of biodiversity and ecosystem services, resilient capacity, technology, finance and accountability leading to a pressing need for legal knowledge, expertise and capacity building.	Mahmood Yekeh Yazdandoost	Not clear what change is being suggested by this comment.
182	1	132	24		29	Table 1.1 We are concerned to see no apparent opportunity for the application of scenarios and models to the pollination assessment. To suggest that this assessment is not addressed because it is already nearing completion is not acceptable. We would recommend that at the very least some limited post hoc scenarios assessment be schedule for this assessment as a further addendum to this deliverable.	Geoff Hicks	The pollination assessment has occurred in parallel with the scenarios and models assessment, therefore there has been little opportunity to interact.

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183	1	132		134		Suggest moving the high level messages from the assessment to the front of the document	Carina Wyborn	This was considered, but it was felt that these high-level messages play a very different role to the key findings and recommendations presented at the start of other chapters, and that they (and the accompanying text) wouldn't make much sense without the reader first being properly introduced to the assessment. They also appear prominently in the SPM.
184	1	132	17			delete principal	UK govenment	Change implemented
185	1	133	18	133	21	But to directly support subsequent decision-making in policy formulation, planning and implementation, scenario analysis and modelling need to be embedded and undertaken within individual and community decision-making processes across a wide range of institutional/governmental contexts and scales.	Marina Rosales Benites de Franco	Change implemented
186	1	133	33	133	36	I strongly agree with the message, but the statement following it is a bit weak. Can't some recommendations on HOW to do this be made rather than just stating its importance and the need for capacity building.	Paula A Harrison	Recommendations regarding this are presented through many chapters of the report, and also feature prominently in the SPM.

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187	1	133	33	134	4	This gives the impression that national models are available and ready for use. The SEEA Expert Forum (http://unstats.un.org/unsd/envaccounting/ceea/meetings/tenth_meeting/BK10a.pdf) concluded that this is not the case. Available models are partial and not yet appropriate for use by national statistical agencies. They are not appropriate because they may lack transparency, may not be at a national scale (with local detail), largely lack coherence with international statistical standards (concepts, classifications, definitions, methods) and incorporate many assumptions that are not obvious or documented.	Michael Bordt	Overall, the report makes this point in several places, including in the new Section 1.6 of this chapter.
188	1	133	10	133	13	This message should be communicated in SPM and be consistent with page 103 line 15-23. A link should be provided to the Guide for Assessments.	Brenda McAfee	The Guide for Assessments is not currently available online.
189	1	133	33	134	10	Decision-making capacity to respond to and utilise scenario based approaches needs some consideration in this text or other sections. Experience from my own research shows that decision makers struggle to understand core scenario concepts related to conveying the range of uncertainties, and where they do there are still limitations in the way in which this type of knowledge can be used and applied within certain regulatory contexts	Carina Wyborn	This point is made in the new Section 1.6, and strongly elsewhere in the report (particularly in Ch 7) and prominently in the SPM.
190	1	133	33	133	40	This chapter is very clear but it does imply that scenarios and models are rather difficult to do as well as being very closely linked, and the two case studies reinforce this. But there are many very simple models that do not require detailed scenario development, yet can be extremely informative. For example, building a golf course will have direct and indirect effects on local biodiversity and ecosystem service. The golf course is a scenario, and the models would be a range of ecological and hydrological models that are already easily available. Or, reducing fishing pressure will allow fish stocks to recover but affect local livelihoods. Again, all the tools for this kinds of scenario-modelling exercise already exist. I think this chapter would be better if it made clear that while there is certainly work to be done, and there are key gaps, there is a huge amount that can and is already available. If the needs are known then there may be sufficiently good tools and models already	UK govenment	Good point – picked up partly by new Section 1.6.
191	1	133	23			change processes to decision and policy makers	UK govenment	Changed to "policy makers and practitioners"
192	1	133	27		31	Repeats above para, delete	UK govenment	Deleted.
193	1	134	15	134	17	Despite recent advances in this field, significant gaps, systematic data and weaknesses	Marina	Changed to:

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						still remain in currently available data, processes and methodologies, and much further work is therefore needed to ensure that scenario analysis and modelling can effectively ~~serve~~ use to the needs of assessment and decision-making into the future.	Rosales Benites de Franco	"Despite recent advances in this field, significant gaps and weaknesses still remain in currently available data and methodologies, and in processes and procedures for applying these. Much further work is therefore needed to ensure that scenario analysis and modelling can effectively serve the needs of assessment and decision-making into the future."
194	1	134	17	134	17	And modeling can effectively serve the needs of assessment and decision-making into the future. However, it looks very ambitious because tools and models cannot work on their own and technically competent manpower would be needed to get the desired results on time.	Jamal Ahmad Khan	Agreed - this need is addressed at length throughout the report, and in the SPM.
195	1	134	22			scientific community and funding agencies-add policy makers and others	UK govenment	Change made.