

Comments from 2nd Review Phase of Chapter 4. Deliverable 2b. Americas Assessment on Biodiversity and Ecosystem Services.

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Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Tom Christensen	0	0	0	0	CAFF 2017. State of the Arctic Marine Biodiversity Report. Conservation of Arctic Flora and Fauna International Secretariat, Akureyri, Iceland. 978-9935-431-63-9, needs to be referenced and mentioned in this chapter. Especially in relation to stressors for the Arctic Marine Biodiversity.	Thanks for the reference. We included more information on Arctic in the final version.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	0	0	0	0	<p>This is a very long chapter which could be reduced considerably. The model for this chapter should really follow the approach taken by Jarvis et al. (2010) which rigorously and comprehensively developed and analyzed key threats to biodiversity as several spatially explicit, continental threats layers (accessibility, conversion to agriculture, fire, grazing pressure, infrastructural development, oil and gas development, and recent conversions). Surprisingly, this reference is not even mentioned - please review this paper and consider using some its approaches. The first 30 pages of this chapter are academic treatments of socio-economic and cultural concepts that while interesting are neither practical to the purpose at hand (identifying the drivers of change to American biodiversity and ecosystems), nor easily used for the development of policy options. Starting with Section 4.4.1 Habitat Degradation and Restoration, the chapter begins to focus in on specific direct anthropogenic drivers (threats and their extents and causes) in a more useful and quite detailed way, with subsequent thorough treatments of Habitat Degradation, (line 941), Pollution (line 1517), Climate Change (line 2013), Biological Invasions (line 2496), and Overharvesting (line 2934),</p> <p>These major sections do a relatively good job of characterizing those anthropogenic drivers, their causes, their extents and regional geographic variation in a general sense. However, they do a very poor job of discussing the impact of the drivers on the ecosystems of interest in the IPBES Units of Analysis (Biomes) i.e. what are the systems being impacted, and how much?. The climate change section draws terms, scenarios (RCPs), findings and strategy implications from recent IPCC work, as it should. Then on Line 3314 the treatment of direct natural drivers begins, and covers a variety of natural disturbances, but in much less detail than the human-caused drivers. There is no detailed or general comparison of the magnitude of the natural disturbances vs the magnitude of the human-caused disturbances</p>	<p>Thanks for the reference. This paper is restricted to one subregion. The structure of the chapter was defined during the Second Authors Meeting and according to the scoping documents.</p>

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	0	0	0	0	<p>Overall - Chapter 4 is very negative and focuses on the negative aspects of harvesting (overharvesting) with minimal mention of some of the excellent sustainable management occurring. It neglects to consider some of the positive aspects of harvesting and we recommend that this is also considered.</p> <p>For example, there is a “Marine” section that also focuses on overexploitation and the negative impacts of fishing. Fishing is well managed in many areas of the Americas and this is not mentioned in this section.</p> <p>Later in the chapter there is a “North America” section that discusses marine harvesting in North America. It includes two sentences about fish stocks being generally well managed before discussing endangered species, collapse of Canadian cod, harvest of marine mammals, and oysters (all which have a negative focus).</p> <p>There is a paragraph on bycatch that is also quite negative. New tools are being introduced to decrease bycatch of vulnerable species—for example enforceable catch caps, better communication between fishermen about bycatch hotspots, and dynamic ocean modeling that predicts locations to avoid based on real-time data and models.</p>	Tried to add a more positive spin throughout the text and describe positive actions governments are taking
United States Government	0	0	0	0	As there are four designated subregions, please take care to keep these subregions distinct throughout the assessment. In general, all of Latin America and the Caribbean should not be used as a comparison to North America or the United States specifically, as that is clearly biased and detracts from the scientific purpose of the assessment. Please ensure this is also reflected in the comparison tables (e.g. Table 4.1 that includes all subregions as well as LAC, Table 4.7 that is a comparison between all of LAC and the U.S. and Canada).	
Elva Escobar	0	0	0	0	The text should address fisheries more widely, specifying that high latitudes and cold waters accumulate more fish biomass due to more food, while low latitudes and warm waters sustain many species each with a low abundance and small sizes due to less food.	This is not needed in the narrative

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Elva Escobar	0	0	0	0	It is key to consider aquaculture vs. the protection of key areas as a mechanism to protect marine diversity.	has yet to be proven out for many species. I am not oppose to this, but not sure if fits with the narrative we have as it would be read as an isolated comment and we would need to provide more detail on
Elva Escobar	0	0	0	0	Usually water is reviewed from the point of view of quality and availability, while it should be reviewed from a cross-cutting perspective.	Noted. We added more information on both aspects.
Elva Escobar	0	0	0	0	It is important to take into account that in fisheries the generational relay plays a key role in changes of populations, of aspirations, of opportunities and automation. Fisheries should be analyzed including society and the different social elements linked to the topic.	sure, many aspects of conservation should be analyzed from the social dimension, but given the space we have not sure we can do much about this.
Enrique Pérez	0	0	0	0	The biophysical sciences are overrepresented. There is more need for social and economic sciences to exploit the main argument of the triggers.	
Enrique Pérez/Miguel Equihua	0	0	0	0	It is important to determine if the chapter is based on a Kuznets point of view. It is important due the relevance of the discusion on growth and development. The former is more socioeconomic meanwhile the latter is more economic and privileges the growth of Net Domestic Product -NDP- instead of Social Development. The question is, then, wheter economic growth drives conservation or not. And other hand, conservation can be achieved just with social development? In the case of the Kuznets curve, it has been teste elsewhere: * Joshi, Prathibha, and Kris Beck. "Environmental Kuznets curve for deforestation: evidence using GMM estimation for OECD and non-OECD regions." iForest-Biogeosciences and Forestry 10.1 (2016): 196. * Mills, J. H., & Waite, T. A. (2009). Economic prosperity, biodiversity conservation, and the environmental Kuznets curve. Ecological Economics, 68(7), 2087-2095. * Pallab Mozumder, Robert P. Berrens and Alok K. Bohara The Journal of Developing Areas Vol. 39, No. 2 (Spring, 2006), pp. 175-190	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Laura Schneider	0	0	0	0	Is it possible to consider "variables of conflict" as drivers? The Brazilian case (Amazon) could serve as a good theoretical example. Proposed literature: Aldrich, S. P., Walker, R. T., Arima, E. Y., Caldas, M. M., Browder, J. O. and Perz, S. (2006), Land-Cover and Land-Use Change in the Brazilian Amazon: Smallholders, Ranchers, and Frontier Stratification. <i>Economic Geography</i> , 82: 265–288. doi:10.1111/j.1944-8287.2006.tb00311.x	
Laura Schneider	0	0	0	0	The statement that population growth should be considered as a critical driver, should be analyzed more thoroughly. The way it is currently written sounds very much like "tragedy of the commons". It should be demographic dynamics and relations with "ecological footprint" what may be used as a driver.	
Manuel Maass	0	0	0	0	It is necessary to consider the lack of clarity in land tenure as a problem that leads to fragmentation of the territory and loss of cover.	
Melanie Kolb	0	0	0	0	The chapter needs to focus on services in order to be able to link ecosystems and society: driver/society - biodiversity/ecosystem - environmental services/link - GQL/Society	
Melanie Kolb	0	0	0	0	Waste management should be addressed as a driver of change in biodiversity and ecosystem services, as it is a very important issue throughout Latin America.	The chapter mentions the fact that many rivers in South America carry raw sewage, but it does not have a specific section on that. Although it is important, more could not be done here for reasons of space
Melanie Kolb	0	0	0	0	The Chapter is very focused on ecosystems. The social and economic counterpart is missing for a consideration of ecosystem services.	
Patricia Balvanera	0	0	0	0	Take into account human footprint as per capita consumption rates, but it should also include the impacts of mining extraction in the local and regional scale, the impacts on biodiversity loss, and be able to explain policy makers the real loss of certain decisions.	
PhD. Elva Escobar	0	0	0	0	It is critical to expand the information related to water print, particularly where inland waters are drying, including its implications in subtropical and subterranean waters.	Noted. Unfortunately due to space limitations we could not cover extensively all the issues.
PhD. Manuel Maass	0	0	0	0	The conception of natural services rather than ecosystem services underestimates the functional aspects of the system in which these services are embedded.	Noted but definitions and concepts are presented in the previous chapters.

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PhD. Rafael Calderón	0	0	0	0	It seems like drivers are being addressed as static, while it is important to keep in mind that they are not static.	
Rafael Calderón	0	0	0	0	The chapter should have a clear definition of "drivers" as well as a wider and clearer explanation of categories, how they function and how they are measured. It can not be assumed that the text on chapter 1 on drivers (which would still have to be improved) is enough. This information should be included at the beginning of the chapter.	Definition of drivers is presented in the Introduction and follows IPBES documents
Rodrigo Medellín	1	11	1	11	Costa Rica?	Corrected.
Liliana Bravo-Monroy	General	135	121	3711	Chapter would be strengthened by providing more cases from locations in each subregion. There are considerable generalities. It is also crucial focusing attention on particularities of the subregions by illustrating cases on different countries.	
Liliana Bravo-Monroy	General	135	121	3711	The use of maps through the chapter would strengthen information given. Maps depicting habitats/conditions in two time periods would be so suitable in order to distinguish changes.	
Liliana Bravo-Monroy	General	135	121	3711	Although types of habitats are almost the same through the chapter, it would be useful to ensure that every driver uses the same category to improve comparability across drivers.	
Liliana Bravo-Monroy	6	135	9	280	Key findings section. There is an emphasis on direct drivers. It would be also useful to increase the content of indirect drivers. A summary matrix could be useful here as a means of crossing drivers vs. habitats.	Key findings were revised after several rounds of discussions during the Third Authors Meeting
Bob Watson		135			I suggest much shorter and punchier bold statements followed by unbolded evidence-based supporting text, which is as quantitative as possible.	Key findings were revised.
Laura Schneider	6	135	9	280	Proposed literature: Lambin, E.F., Turner, B.L., Geist, H. J., Agbola, S.B., Angelsen, A., Bruce, J.W., Coomes, O.T., Dirzo, R., Fisher, G., Folke, C., George, P.S., Homewood, K., Imbernon, J., Leemands, R., Li, X., Moran, E. F., Mortimore, M., Ramakrishnan, P.S., Richards, J.F., Skanes, H., Steffen, W., Stone, G.D., Svedin, U., Veldkamp, T.A., Vogel, C., Xu, J. (2001). "The causes of land-use and land-cover change: moving beyond the myths." Global Environmental Change 11: 261-269.	Thanks for the reference.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Carlos Alfredo Joly	6	136	6	138	Living standards in the Americas improved in the last 15 years, but inequity remains - OR HAS INCREASED????, and 136 increasing human demand for food, water, and energy have undesirable consequences for 137 biodiversity and nature's contributions to people (NCP) (well established).	Text was revised.
Diego Pacheco	6	136	6	145	There is the need to include here the discussion of the uneven access and distributino of natural resources and their impacts on the inequitable access to NCP.	Noted but this is covered by chapter 2.
Bob Watson		136			"Living standards in the Americas improved in the last 15 years, but inequity remains" - This is a fact. Not a key finding of the assessment - delete	Key findings were revised.
Bob Watson		136			Be factual – delete “undesirable” and replace with “loss of biodiversity and many of natures non-material and regulating NCP.”	Key findings were revised.
United States Government	6	136	6	145	This section is an odd opening for this chapter as it seems unbalanced and overly focused on the "natures' benefits to people" instead of "status of biodiversity and ecosystem services". Please revise or move later in the "key findings" so the opening of the chapter is more balanced and better reflects all components of the chapter.	Text was revised. We followed terminology defined by IPBES.
United States Government	6	136	6	136	Please delete the reference to "but inequity remains" as this is subjective.	Text was revised.
Co-chairs	6	137			"undesirable" can only be interpreted relative to what is "desirable" and that is dependent on vlaves and world view. Give the nature of the "consequences" and not the value statement of whether they are wanted or not.	Text was revised.
Bob Watson		138			"Seventy two million...Nort America (4.3.69"- Delete not an IPBES finding and not directly linked to BD and NCP	Key findings were revised.
Manuel Maass	6	138	6	138	Are we trully doing better than 15 years ago as the text suggests? The chapter infers that there is an improvement in the quality of life of people in the contienent; and, it should be more precausious about the topic.	Text mentions that some aspects did improve while did not.
Marcelo Cabido	6	140	6	140	Please, check those numbers: The CEPAL recognizes a 29.2% of poor people for LAC and not 63%. By the other hand, the population of SA in 2015 reached 410 million people; hence, it seems to be certain incosistencies in the numbres.	Text was revised.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Margarita N. Lavidés	6	142	6	144	The sentence should read as follows: Growing pressures on natural resources are reflected on high per capita consumption of natural resources, growing dependency on commodities exports and other conditions.	Text was revised.
Cristobal Diaz	6	143	6	144	I propose include: "Growing pressures on natural resources are reflect high per capita consumption of natural resources, unsustainable production and consumption patterns, growing dependency on commodities exports and other conditions.	Text was revised.
Miguel Equihua	6	143	6	145	It should be interesting to include the IPAT equation in the main argument. Some examples: http://web.mit.edu/12.000/www/m2015/pdfgroup1.pdf https://www.google.com.mx/url?sa=t&rct=j&q=&esrc=s&source=web&cd=42&cad=rja&uact=8&ved=0ahUKEWjy3uKy19_UAhUpxoMKHZ7dAIE4KBAWCC8wAQ&url=http%3A%2F%2Fwww.humanecologyreview.org%2Fpastissues%2Fher161%2Fmckinneyetal.pdf&usg=AFQjCNFSIYhwPzTrLTg8h8cDRc2H3KwDuw https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3357752/pdf/13280_2011_Article_185.pdf	Thanks for the reference.
Co-chairs	6	144	6	145	This is true but a different point than the rest of th paragraph. The energy consumption could be higher for many reasons of which Standard of Living is only one	Text was revised.
United States Government	6	144	6	145	This sentence could be perceived as biased; please delete or reword to reflect that nearly all developed countries have higher primary energy consumption relative to non-developed countries. The sentence could read: "Total primary energy consumption is currently higher in more developed countries, including North America and OECD America countries, than non-OECD America countries.	Text was revised.
Bob Watson		145			This new sentence provides some quantitative information to support the first bold sentence.	Key findings were revised.
Diego Pacheco	6	146	6	154	It is better to reflect and economic growth linked to unsustainable patterns of consumption can affect adversely to biodiversity and NCP when environmental and social development goals are not accounted for.	Text was revised.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Rosa María Chávez Dagostino	6	146		154	"Economic growth is the main driver of resource consumption and can positively impact biodiversity".... This sounds contradictory. Economic growth means commercial transactions of products, materials and services. It is also well established that as GDP increase,s biodiversity goes down. That is in function of two factors: energy and monetary systems as amplifiers... See Zaidi M. 2016 (ZSL).	Text was revised.
Bob Watson		146			Delete "total primary energy...non OECD Americas"— not linked to BD and NCP	Key findings were revised.
Bob Watson		146		147	I challenge this statement as written – consumption is the product of economic growth and increases in population, as well as behavioural choices – the increase in resource consumption is not just due to economic growth. Since 1960 the population of N. America increased ny a factor of 1.8 and Latin America and the Caribbean by a factor of 2.97 – therefore the increase in resource consumption is as much to do with population increase as economic growth.	Key findings were revised.
Rodrigo Medellín	6	146	6	147	How can it positively impact biodiversity and NCPs?	Text was revised.
Sofía Treviño Heres	6	146	6	154	The text is ambiguous and does not achieve to define any drivers of change of biodiversity (only economic growth as the main driver of resource consumption, but as a positive or negative impact on biodiversity). The text should be clearer on the importance of sustainable development (economy + social + environment) policies and practices.	Text was revised.
Cristobal Diaz	6	147	6	148	I suggest add: "..., but currently is done under unsustainable conditions and for this reason it adversely impacts biodiversity and NCP when environmental and social development goals are insufficiently accounted for	Text was revised.
Marcelo Cabido	6	155	6	176	The two statements seem rather contradictory. It is not absolutely clear whether migration to urban areas will promote nature conservation and NCP enhancement or will increase the demand for woods and services.	Text was revised.
Co-chairs	6	158	6	169	This is incmplete and therefore raises more qesitons than it answers. It would be clearer if the text also included the proportion of the apparently subsantially greater (12.4% compared to 5.2% of global) exports from NA that are "natural resources".	Text was revised.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Miguel Equihua	6	158	6	159	It is important to mention if the values are represented in monetary or mass units. https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=151&menu=1515 http://theconversation.com/the-decoupling-delusion-rethinking-growth-and-sustainability-71996	Text was revised.
Cristobal Diaz	6	159	6	159	Please write North America	Noted.
United States Government	6	159	6	159	but' seems negative in this context; please change to 'and.' The sentence would then read: "The Americas generate around 17.6% of world exports, and 70% of this proportion is from North America.	Text was revised.
Rodrigo Medellín	6	159	6	159	America, not American	Text was revised.
Co-chairs	6	163	6	165	This sentence just repeats what is in the bold headline. Edit to remove redundancy.	Text was revised.
Bob Watson		165		169	The original text did not really support the bod text	
Diego Pacheco	6	170	6	176	It is better to point out that population growth and rapid unplanned urbanization could be one of key drivers of environmentla degradation.	Text was revised.
Marcelo Cabido	6	170	6	176	Is urbanization really a relevant issue when it is compared, for example, with deforestation, habitat loss and fragmentation, etc.?	Yes, it is considering the number of people affected in urban areas by air and water pollution, among other factors.
Margarita N. Lavidés	6	170	6	176	One of the primary pressures arising from population growth and urbanization as key drivers of regional environmental deterioration is land use change, specifically increasing land areas from natural areas of biodiversity to urban sprawl. Maybe it would be good to mention in this section some regional or national statistics on land use conversion from natural areas of biodiversity to urban areas.	Noted.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Laura Schneider	6	170	9	271	<p>Include within the transposition of landscape coverage, results on generation and recovery of tropical forests.</p> <p>Miguel Martínez-Ramos, Aline Pingarroni, Jorge Rodríguez-Velázquez, Lilibeth Toledo-Chelala, Isela Zermeño-Hernández, Frans Bongers, 2016.</p> <p>-Natural forest regeneration and ecological restoration in human-modified tropical landscapes. <i>Biotropica</i>, 48 (6): 745-757.</p> <p>-Karen L Vandecar, Deborah Lawrence, Dana Richards, Laura Schneider, John Rogan, Birgit Schmook, Henry Wilbur. 2011. High mortality for rare species following hurricane disturbance in the Southern Yucatan. <i>Biotropica</i>, 43 (6): 676-684</p> <p>-Megan McGroddy, Deborah Lawrence, Laura Schneider, John Rogan, Irene Zager, Birgit Schmook. Damage patterns after Hurricane Dean in the southern Yucatán: Has human activity resulted in more resilient forests? 2013. <i>Forest ecology and management</i>. 310:812-820.</p>	Thanks for the references. Information of forest recovery was included when available.
Bob Watson		172		176	Delete – identical with old text with my edits to bold text	
Co-chairs	6	173	6	175	What about NA? Won't the increasing urban/sub-urban spawn of NA metropolitan areas affect any species? Is there no growth of urban areas in the Caribbean?	Text was revised.
Brenda McAfee	6	174	6	176	This statement is a very broad generalization which does not appear to be discussed in section 4.3.5. Urban planning will differ by city and municipality.	Text was revised.
United States Government	6	174	6	176	Please provide evidence for this statement.	Noted.
Diego Pacheco	7	177	7	188	This paragraph about ILK seems to be appropriate, however I disagree with the fact that ILK is an expression of social capital. Also the language of biodiversity and ecosystem services should be replaced to NCP. Also, I disagree strongly with the use of ethnic groups since the right referene is about different cultural groups and identities. Also it could be important to have a reference about self-governance systems, and particularly governance of the common goods.	Text was revised.
Cristobal Diaz		177		177	I suggest add - Value systems.....	

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Bob Watson		177		180	This could be shortened to read: Governance systems, which are shaped by the differing values held by different cultural and ethnic groups, strongly influence decisions on land use and the exploitation of natural resources.	
Diana Lope-Alzina	7	177	7	188	Values are addressed isolated, while they should be linked to policies that reinforce them.	Noted but Policies are covered in Chapter 6.
Miguel Equihua	7	177	7	180	Suggested: "Values differ among cultural and ethnic groups across the whole region. Values shape governance systems, especially concerning development policies, land tenure and resources use rights. Therefore, different value frameworks strongly influence decisions on land use and natural resources appropriation in the different subregions."	Key findings were revised according to discussions held during the last authors meeting.
DPG/Sbio/MMA	7	181	7	182	Instead of "Indigenous and local knowledge (ILK)", we suggest "indigenous and local communities traditional knowledge (TK)" in harmony with the Convention on Biological Diversity (see art. 8j) and Nagoya Protocol.	Noted. We used the terminology defined by IPBES
Ederson A Zanetti	7	189	7	212	There should be mention to increased atmospheric CO2 and NPP. Agriculture also includes wood production for construction and energy? If not there should be specific mention to silviculture and HWP influence on biodiversity and ecosystem services, specially in north america were 95% of housing is from native tree species and consequences in south america where few species are used and NPP is raising	Sorry, we could not understand this comment.
Bob Watson		189		193	Delete "Values differ among cultural and ethnic groups across the whole region and shape governance systems, in particular ways of addressing development policies, land tenure and indigenous rights, and strongly influence decisions on land use and natural resources exploitation in the different subregions "	
Bob Watson		189		193	Simplify and shorten and then use unbolded text to support the bold text. The bold text could read: Habitat conversion, fragmentation and overexploitation are resulting in a loss of biodiversity and a loss of NCP in all ecosystems. The unbolded text would then highlight and support this statement – use some of the current bold and unbolded text	
Dalia M. Salabarría	7	194	7	194	There should say: degradation and pollution ecosystems.	Text was revised.
Marcelo Cabido	7	199	6	199	I suggest to add "and fragmentation" after "habitat loss"	Text was revised.
United States Government	7	206	7	209	Please provide evidence for this statement.	Noted.
Margarita N. Lavides	7	210	7	210	Correct: 'threatening' to threatening	Corrected.

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Co-chairs	7	211	7	212	the phrase "can be identified" implies that they are known but not used. If there are cases of "sustainable practices" also being used, this should be acknowledged in the sentence.	Noted.
Anna Yusa (Health Canada)	7	214	8	262	Fossil fuel combustion and climate change are currently disconnected; propose that the links between them are addressed - particularly as the relevant sections are next to each other. This includes within the main section that begins on page 55. Propose active language linking to climate change in the key point that begins on line 214 (bold text).	Text was revised.
Brenda McAfee	7	214	8	240	Do references to North America include Mexico or is reference to the North America sub-unit?	Not always the available literature follows the subregion division proposed by IPBES.
Ederson A Zanetti	8	214	8	240	there should be mention to increase CO2 and NPP, very well documented in north america and with some data from south america already available	Sorry, we could not understand this comment.
Marcelo Cabido	7	214	8	240	Perhaps a statement could be added concerning the pollution of fresh water bodies through the use of pesticides and fertilizers	Text was revised.
Bob Watson		214		240	This key finding needs a massive edit – it mixes many different issues (e.g., plastics is not an issue associated with fossil fuels, nor is over-exploitation of fisheries) – the unbolded text does not do a good job of supporting the bold text – please simplify – use more than one finding if needed. The bold text could read” The combustion of fossil fuels is changing the chemical composition of the atmosphere adversely impacting marine and terrestrial ecosystems and human health. The unbolded text would then support this statement without mentioning plastics in the ocean, or other extraneous issues. The next key finding would then discuss human-induced climate change.	
United States Government	7	214	8		Please provide examples that are more focused on biodiversity and ecosystem services; many of the examples in this section are quite human focused.	Human quality of life is also a component of IPBES assessments.
Miguel Equihua	7	214	7	240	The paragraph should be more concise in specifying that in this case the importance of pollutants is due to climate change. And, the paragraph should be split to point out, in first place, pollutants linked to climate change; and secondly, to other pollutants.	Text was revised.

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Rodrigo Medellín	7	214	7	217	What about mercury and other mining related minerals? They have VERY clear negative effects on human quality of life (not via air pollution necessarily)	Text was revised.
Co-chairs	7	215	7	216	Is fossil fuel consumption "THE major driver" of ocean deoxygenation? It plays a role but in all areas where anoxia is currently a problem land based runoff of agricultural, municipal and industrial chemicals and nutrients are the <i>major</i> driver.	Text was revised.
Cristobal Diaz	7	216	7	217	The expression (4.4.2) (well-established) is repeated	Noted.
Bob Watson		216			I strongly doubt that the effluents from the combustion of fossil fuels are the major driver of deoxygenation in marine environments – run-off from land-based sources is almost certainly the most – it certainly is in the US and most parts of the world, therefore I have suggested softer language	
Bob Watson		217		220	Has this been critically assessed and validate dby health experts – which air pollution is being discussed – indoor air pollution, urban air pollution or regional air pollution. Which gases and particulates are responsible – this needs much more data to remain in the key findings.	
Rodrigo Medellín	7	218	7	218	Established or not?	Text was revised.
Bob Watson		224			Be more specific – what pollutants and which parts of N. America are effected?	
Bob Watson		226			Quantify ph changes to date	
Bob Watson		227			Which parts of the food web are dissolving – be specific.	
Bob Watson		228			Are you saying that coral reefs are being physically flattened by ocean acidification?	
Bob Watson		228		229	This seems extreme – what change in ph would be required for this to occur	
Bob Watson		230			quantify "become warmer"	
Co-chairs	8	233	8	234	This is a global figure and the literature source attributes most of the source of the plastics to Southeast Asia. Give a figure for plastics from the Americas or delete.	Text was revised.
Ederson A Zanetti	8	241	8	262	there should be mention to increase CO2 and NPP, very well documented in north america and with some data from south america already available	Same comment above.
Marcelo Cabido	8	241	8	262	It is not clear after this statement whether changes in climate might be less or more relevant than land use and land cover change as drivers of changes in NCPs.	Text was revised.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		241		242	<p>This key finding needs to be rewritten – a short punchy bold text then supported by unbolded text, e.g., Human-induced climate change is affecting ecosystems throughout the America’s due to changes in temperature and precipitation, including the frequency and intensity of extreme events. This would then be followed by some of the text that is currently bolded and unbolded, and new text from IPCC. Please read the IPCC WG I and WQG II SPMs and Technical summaries before redrafting this whole key finding. For example, the IPCC WGI does not make any strong statements regarding the frequency or intensity of hurricanes either historically or projected into the future..</p> <p>The finding should focus on what changes have been observed to date (use a combination of IPCC WG I and WG II). The current text is very general, policymakers need much more specific findings.</p> <p>The key finding oscillates between what has been observed and what is projected.</p> <p>Focus on the observed changes in the climate system – be quantitative (use IPCC WG I) followed by what has happened to specific ecosystems/biomes (Use WG II)</p>	
Juan comerma	8	244	8	244	Evergreen montane forest has not been mentioned before. For the mountain tropical is quite important for many crops and biodiversity	Noted.
Rodrigo Medellín	8	245	8	245	Why is all this not referred to "well established" or not?	Noted.
Daniel P Faith		247		251	re "Biodiversity will be impacted significantly by climate change" the list is all processes, not biodiversity!	
Bob Watson		247		248	Not supported by IPCC	
Cristobal Diaz	8	254	8	254frequency of extreme events as cyclical, severe and prolonged droughts in the region	
Ederson A Zanetti	9	263	9	271	There should be mention to strategies focused on increasing wood consumption for construction and energy to increase biodiversity cultivation - specific species	Noted.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Marcelo Cabido	9	263	9	271	This might not be homogeneous for all the Americas. This statement seems to highlight that the recover of ecosystems functioning (perhaps mediated by some dominant functional plants and animal groups) is more likely to occur than the recover of species richness. If this is the case, which are the implications of restoration for NCPs at the short to medium term	Noted.
Marcelo Cabido	9	263	9	280	These last two statements appear as almost obvious assertions	Noted.
Bob Watson		263		267	This could be shortened to read: Although most ecosystems in the America's continue to be degraded, an increase in conservation and ecological restoration is having positive effects, although costs can be significant and the full reversal of the adverse impacts of human activities is rarely possible (well established)	
Co-chairs	9	264			use of "undesirable" again. Change for same reasons as in row 7.	Noted.
Rodrigo Medellín	9	264	9	264	We all know that restoration is much more expensive than conservation	Noted.
DPG/Sbio/MMA	9	267	9	269	"Evidence from different subregions indicates that structure and functionality of ecosystems recover faster than species richness (particularly in species-rich biomes)." - This information could be detailed with more information and references, maybe some examples. "Non-material benefits may not be restored for some people." - Such as? This information could be detailed with more information and references, or even indication of information and references in chapter 2 that can confirm or exemplify this information.	Noted.
Manuel Maass	9	267	9	268	The text mentions that "structure and functionality of ecosystems recovers faster than species richness". However, the species richness is a structural component of the ecosystem.	We are considering - structure (biomass) and composition (species identity and richness)
Brenda McAfee	9	268	9	269	Is it only non-material benefits that may not be restored? And only for some people? Or possibly <i>All benefits may not be fully restored?</i>	Text was revised.
Bob Watson		269			I would suggest that all three contributions would rarely be fully restored – i.e., material, non-material and regulating	
United States Government	9	279	9	280	Recommend deleting this final sentence as the sentence before it more accurately describes possible influences for the variety of conditions. The final sentence oversimplifies context.	Text was revised.
David Loreto	9	281	9	281	Develop key messages to highlight the need to identify and analyze approaches and factors of resilience and how the theoretical and methodological link between resilience and sustainability is carried out	Key findings were revised

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
David Loreto	9	281	9	281	Develop key messages to highlight the need to identify and analyze approaches and factors of resilience and how the theoretical and methodological link between resilience and sustainability is carried out	Key findings were revised
Marcelo Cabido	10	282	12	333	I suggest that all the Introduction should be revised and structured in a more straight and organized way. For ex., start with the importance of drivers, following with definitions and concepts related to both indirect and direct drivers and then a more clear presentation of the different sections of the Chapter.	Thank you. The section was revised but most of the elements suggested are already in the text.
Bob Watson		285			Delete:" The resulting changes in terrestrial, freshwater and marine environments are interrelated and they change biogeochemical cycles, pollute ecosystems, and promote overexploitation and biological invasions. "	
Marcelo Cabido	10	290	10	290	By definition, "biodiversity hotspots" are not only rich in species numbers but also in endemic taxa	Revised.
Co-chairs	10	291	10	293	This is saying that NA is NOT " diverse and heterogeneous" - despite ranging from the Arctic tundra and Greenland glaciers to the Floriday everglads, Sonoran desert and Rocky Mountain peaks. Correct the messaging.	Revised.
United States Government	10	294	10	305	These sentences are speculative; please revise or delete.	Evidences are provided in the following sections
Cristobal Diaz	10	296	10	296	I suggest add: "...historical patterns of growth induced by non-sustainable production and consumption	Revised.
Numa P. Pavón Hernández	10	299	10	299	I consider that this statement (weak environmental governance) needs an explanation.	Evidences are provided in the following sections.
Co-chairs	10	301	10	303	The sentiment is reason but the actual statement is unnecessarily and unconstructively confrontational, and can be challenged in detail. Many countries in fact do claim that the environment is a high a priority, even if their action sdo not support the claims. this might better be expressed as something like "Environmental and climate change issues are gaining weight regionally, but economic development still remains a comparable priority and often continues to be pursued at the expense of the environment." then the debate is shifted from what the countries say their priority are to the outcomes, which are hte IPBES concern.	Sentence was revised but the sentence is support by evidences presented in the chaper.
Rodrigo Medellín	10	304	10	305	Weak and unsustainable but VERY important	Evidences are provided in the following sections.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	10	312	10	312	Indirect drivers also are "unequivocal" in having <i>some</i> effect on ecosystem processes, because if the indirect drivers necessarily affect direct ones and the direct ones necessarily affect ecosystems, then things that change the direct drivers necessarily affect ecosystems as well. The difference is not in likelihood of having an effect (equivocal) but in the "diffuseness" - whether or not there are mediating factors between the driver and the parts of the ecosystem being altered. even direct drivers can have mediating factors that can amplify or buffer their impact on ecosystems, but through their action on the driver or on the ecosystem, not by being <i>between the driver and the ecosystem</i> .	Noted. Text comes from the IPBES documents.
Rodrigo Medellín	10	313	10	315	Why are the definitions here? leave them in Box 4.1	The paragraph is just a general description while the Box provides details.
Numa P. Pavón Hernández	10	316	10	318	It seems like it not is the same definition that box 4.1	Not agreed.
Diego Pacheco	11	323	11	334	I recommend not to introduce additional figures with particular conceptual frameworks. There is the need to follow and respect the conceptual framework of IPBES. I suggest to delete this figure and keep the discussion attached to the CF of IPBES.	The inclusion of the figure was a demand of reviewers of the First order draft.
DPG/Sbio/MMA	11	334	11	337	Figure 4. 1. needs to be revised. That is a lot of mixed up letters and symbols.	Noted. Figure lost the format with the conversion to PDF.
Liliana Bravo-Monroy	11	334	11	338	Figure 4.1 highlights negative effects (e.g., loss of biodiversity and ES). Interactions could be also display how links can promote possitive effects of drivers on ecosystems. It would be helpful to improve the style of diagramming.	Noted. Figure lost the format with the conversion to PDF.
Cristobal Diaz	11	334	11	335	The Figure 4.1 need to be improved, because we can´t see clearly	Noted. Figure lost the format with the conversion to PDF.
Rodrigo Medellín	11	334	11	335	Why is human population growth NOT here? Just demographic trends. CALL IT WHAT IT IS Also, Economic development PER SE is not the driver; unplanned or not-sustainable is. Same for technological development	Human population growth is included in Demographic trends. Economic development is qualified in the coming section.
Virginia Meléndez Ramírez	11	336	11	336	The figure could not be observed well, adding illegal traffic of flora and fauna.	Noted. Figure lost the format with the conversion to PDF.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	12	339	12	340	Title could gain clarity if long sentence is broken down into two shorter sentences.	Title was revised
Liliana Bravo-Monroy	12	339	12	341	Box 4.1: Inclusion of bibliographic references would strengthen the text	Text comes from IPBES document.
Liliana Bravo-Monroy	12	339	12	341	Box 4.1: In the paragraph starting with "The direct anthropogenic drivers...", it would be suggested to use the expression "biological control of pathogens by introduced (micro)organisms", instead of "natural enemy...".	Text comes from IPBES document.
Liliana Bravo-Monroy	12	339	12	341	Box 4.1: It is suggested to include the title of the figure. It seems almost the same IPBES conceptual framework.	Noted. The figure is indeed derived from the IPBES conceptual framework
Bob Watson		339		341	bOX. 4.1: Some good text, but it needs more text on indirect drivers, e.g., economic, demographic, S&T, cultural, socio-political	
Marlín Pérez Suárez	12	339	12	341	Figures 4.1 and 4.10 are not well appreciated	Noted. Figure lost the format with the conversion to PDF.
Diego Pacheco	12	340	12	340	There is no need to introduce the Box 4.1 Since a simple definition of indirect and direct drivers can be undertaken in a very short way earlier in the document or in each specific section.	The box was included after comments of reviewers of the First order draft
Marcelo Cabido	13	342	14	384	The introduction (issue 4.3.) is too long and too much focused in teleconnection	
Bob Watson		342			4.3. Indirect anthropogenic drivers : This section needs to be expanded with more quantification of both historical and projected trends (the implications of the projected trends should not be discussed as that is the mandate of chapter 5. However, this chapter should quantify the projections for population, economic growth (both GDP and PPP).	Historical and projected trend for GDP and population were included .
DPG/Sbio/MMA	13	346	13	346	Instead of "Indigenous and local knowledge (ILK)", we suggest "indigenous and local communities traditional knowledge (TK)" in harmony with the Convention on Biological Diversity (see art. 8j) and Nagoya Protocol.	This used in this way in IPBES.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	13	347	13	350	What is not mentioned, but is particularly relevant to IPBES, is that in general "Policy" is made to directly alter the magnitude and way that indirect drivers are expressed by society. The goal of a policy may be to reduce land degradation, but the policy does not specify that land degradation be changed. The policies specify how the activities causing land degradation should be changed. That is why it can be argued that they are the more central concern of IPBES than direct drivers are. They are the more policy-relevant drivers.	
United States Government	13	351		353	Consider removing or revising the negative reference to "poor local governance and corruption." The sentence could read: "The indirect anthropogenic drivers can be classified according to the origin of the driver. For instance, it can be tied to local processes, such as local governance."	Accepted
Co-chairs	14	356	15	488	This entire section is general and discursive. It is illustrated but doesn't really inform. Particularly the NA section ((444-447) refers to "complex systems" unspecified pressures and unspecified risks. The SA section at least has one example, but even there one sees only a shopping list of a need for more financing, coordination, more enforcement, etc. The section does not help readers know how well these systems work at present, what are the causes of their less than full effectiveness, what to do to fix the weaknesses - or even how to look for ways to find out if there are weaknesses, where the weaknesses are centered, and how to fix them. Strengthen or delete.	
Co-chairs	13	358	13	362	The exact language of teleconnections and telecoupling may be new to the dialogue, and perhaps even the concepts new to some fields. But the "distant water fleets" and the disconnect of fishing vessels, landings and markets from the places where the fish were taken was central to the discussions leading to both the LOSC and the later "Fish Stocks Agreement", so the concepts have been part of policy dialogue since at least the 1970s. Please, correct.	
United States Government	13	358	13	369	Consider revising and clarifying this section. For example, the concepts of teleconnection and telecoupling need to be explained. Further, the linkages between the different concepts presented could be made more clear.	To be responded jointly to C154
Rodrigo Medellín	13	360	13	360	not only until recently	To be responded jointly to C154

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	13	370	13	380	Please revised to make clear the connects to IPBES or delete the paragraph.	
Krista Locs	13	371	13	372	Suggest using the proper name "2030 Agenda for Sustainable Development".	Accepted
Rodrigo Medellín	13	376	13	376	Patterns of consumption. Established long ago	Noted
Cristobal Diaz	13	382	14	384	I suggest add: unsustainable production and consumption patterns	Incorporated into existing ID
Marcelo Cabido	14	384	14	384	Why considering "Welfare" as a driver?	Human development
Krista Locs	14	386	16	462	Section 4.3.1 Governance systems and institutions (formal and informal) should include a description of governance in Canada where federal, provincial and territorial governments have committed to achieve the goals and objectives of the United Nations Convention on Biological Diversity through a collaborative approach. There should be a reference to the 2020 Biodiversity Goals and Targets for Canada, available at: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1 .	To be explore as a reference. Not details

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Diego Pacheco	14	386	14	462	<p>In this section, there is the need to reflect the great advances, particularly in South America and in the Caribe about the decentralization of natural resource management and its impact on NCP.</p> <p>Also, it is missing the overall policy of devolution of property rights to indigenous peoples and local communities, either as public, private or common forestlands.</p> <p>The discussion of indigenous peoples and local communities institutitons (formal and informal) for the management of the common goods is also very relevant and is completely missing.</p> <p>There is the need to discuss not only forest governance arrangements but also water governance arrangements (considering that there are many institutonal arrangements governing water and that irrigation systems are common goods).</p> <p>Also, it is important to mention the polycentric institutional arrangements including multi-level scale governance from the national to the local levels. It is important to include the self-governance of indigenous peoples and local communities, based particularly on informal rules for the management of natural resources.</p> <p>Finally, it is also important to introduce the recognition in some countries of the ILO 169 Covenant and of the United Nations Declaration on the Rights of Indigenous Peoples. In Bolivia, following these international norms, indigenous territories have recognized with legal property rights and with political autonomy. This has an important impact in the management of natural resources and NCP at the subnational levels.</p> <p>Also, regarding governance is important to point out the recognition of the rights-based approaches promoting a better coupling between humanbeings and nature, introducing the recognition of the rights of Mother Earth (for example, the laws of Bolivia and Ecuador).</p>	
Marcelo Cabido	14	387	14	393	Is it posible to present a more friendly/simpler definition of gobernance?	
Marcelo Cabido	14	387	15	458	The whole section 4.3.1. is made up of rather disconnected paragraphs and lacks a common core idea or framework.	
Liliana Bravo-Monroy	14	389	14	389	It is not clear the expression "coalitions of the willing"	To be checked
Numa P. Pavón Hernández	14	390	14	393	With an exponential growth in the last decade. Why?	??

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	14	394	14	404	It would be helpful to include a case or example that support the ideas/argument proposed.	
Marcelo Cabido	14	394	14	404	Perhaps this paragraph could be eliminated	?? - Related to C168
Rodrigo Medellín	14	394	14	394	Weird way of writing and opening a paragraph. Only one like this so far	
United States Government	14	401	14	404	This sentence is unclear; please clarify.	?? - Related to C168
Co-chairs	14	402	14	404	This is a highly elitist list of participants. There is a very large literature documenting that not only the governance processes themselves must be inclusive of those affected by the governance decisions, if they are to work effectively, but the dialogue processes informing the decisions processes must be comparably inclusive. Revise to acknowledge the value of inclusivity more fully.	
Co-chairs	14	405	14	419	This whole paragraph does not seem to hold together. The first 2/3 talk about how forest governance actually includes at its heart a lot of culturally-based informal rules, as well as the formal rules of the institutions. Then it says good policies adopted by governments have sometimes produced no real-world benefits because of this mix of rule systems. The only conclusion to draw is that the community based rules are the ones undoing the potential benefits of good policies from the top. Is that the intended message, but the usual intended meaning is just the opposite_ that the top-down processes with formal rules often cause harm by disrupting the more effective social and cultural rules. Clarify.	??
Ederson A Zanetti	14	407	14	407	There should be mention to tree species, not forests, regarding which will be used and which will not	??
Liliana Bravo-Monroy	14	416	14	419	In quantitative or qualitative terms, to what extent have policies brought real change for the benefit of communities?	??
Rodrigo Medellín	14	418	14	419	Have the new policies been implemented in earnest?	??
Ederson A Zanetti	15	420	15	426	There should be mention to the positive effects, since they are referred to at the beginning of the paragraph. There should be specifics on how cultivation of biodiversity to supply markets can cope with preservation of species.	
Cristobal Diaz	14	421	14	422	I suggest add: " Economic globalization produces tremendous impacts on environmental processes at the local, regional, national, and global levels, <u>mainly when transmit to our countries unsustainable production and consumption patterns</u>	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	15	427	15	437	Despite the fact that the Amazonian rain forests are mentioned, it would be suitable to include more physical areas in Latin America where the situations described are happening.	
Ederson A Zanetti	15	431	15	431	There should be comments on how biofuels can be a threat or a benefit to species, including tree species and residues from wood construction	
Rodrigo Medellín	15	433	15	433	Amazon is poor soils!	?? Mercedes
Liliana Bravo-Monroy	15	438	15	458	Although the generality of the context is described, it would be important to include specific cases of the region. For instance, see Estrada-Carmona et al (2014), in which 104 integrated landscape initiatives were surveyed and analysed for food production, livelihood improvement, and ecosystem conservation in 21 countries of Latin America and the Caribbean. Participants involved farmer or producer organisations, NGOs, local government leaders, etc. who could provide a complementary perspective to the cases cited in Box 4.2	
Rodrigo Medellín	15	438	15	443	Good stuff!	Thanks
Brenda McAfee	15	444	15	447	It would be helpful to have examples of these challenges from North America (unit of analysis or continent?) similar to what is presented for LAC in the previous paragraph.	
Margarita N. Lavides	15	444	15	444	Correct: 'recently' to recent	Accepted
Rosa María Chávez Dagostino	15	444	15	445	...recently environmental challenges have emerged that are proving harder to manage within existing policy framework.... Some examples here about these environmental challenges would make the text clearer to understand differences between LAC and NA	Related to C184
United States Government	15	444	15	447	What are the challenges? Maybe provide examples?	Related to C184
United States Government	15	447	15	447	Consider including an example of the risks that are novel in form and magnitude. Further, please clarify whether the following paragraphs are about approaches to addressing risks or if they are a series of disconnected and separate items.	
Héctor Tuy	15	452	454		It should be stressed the work done on System of Environmental-Economic Accounting (SEEA) in LAC. WAVES "Natural Capital Accounting" is just a temporal program. Some LAC countries are way ahead of these initiatives. Perhaps a "Box" with those experiences would help other countries to "discover" SEEA as an interesting and workable framework...	Text limits does not allow detailed info. Referende to the LAC progress on this, to be added.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	16	460	16	462	Box 4.2: Interesting cases	Thanks
Luis Ubaldo Castruita Esparza	16	460	16	462	There should be include the status of Wirikuta in Mexico and, the problem of the wixárikas with mining, as well as implications for Indigenous local knowledge and territory values	??
United States Government	16	460	16	462	All examples here are in South America. It would be good to have examples from the other subregions as well, if possible.	Related to C191
Co-chairs	16	461	text	box	these are well-presented illustrations of indigenous peoples and their potential role in environmental governance. However, if there is room for four stories they should be from each of the four subregions, and have a greater diversity of LK as well as LK. Moreover, there should be some message drawn from them that is relevant to governance as a DRIVER - not just the voices of people affecting isolated local decisions.	Related to C191
Diana Lope-Alzina	16	461	16	462	When discussing ILK, the co-evolution of biological and cultural diversity should be linked to territory.	
Diana Lope-Alzina	16	461	16	462	An example of Mexico for Box 4.2 is the diversity of maize breeds linked to cultural diversity and territory. -Boege, Eckart. 2008. El Patrimonio Biocultural de los Pueblos Indígenas de México: Hacia la conservación in situ de la biodiversidad y agrobiodiversidad en los territorios indígenas. INAH-CDI, México. Available in: http://www.cdi.gob.mx/biodiversidad/biodiversidad_0_preliminares_1-31_eckart_boege.pdf (verified 17.07.17) -CONABIO. 2009. Centros de origen. In: Biodiversidad Mexicana. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México. Available in: http://www.biodiversidad.gob.mx/genes/centrosOrigen/centrosOrig.html (verified 17.07.17)	Related to C191
Rodrigo Medellín	16	461	15	462	Evidence? IF anything, esp. in Peru, Indigenous groups are becoming weaker and more acculturated	Related to C191

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Diego Pacheco	16	463	16	568	<p>There is the need to summarize this section and present only the most relevant features with implications on biodiversity.</p> <p>It is important to highlight the main economic differences in the growth of the American region. It is missing the mention to the unsustainable patterns of production and consumption of the countries with higher economic growth (North America and Canada).</p> <p>Very much of the discussion on the distinctions among countries can be overcome by introducing more figures and maps, and then showing up the differences of GDP, income, and other variables between countries.</p> <p>Taking into account previous considerations I suggest shortening this section.</p> <p>I consider that Table 4.2 is unnecessary and does not help to the better understanding of the economic differences among the countries.</p>	Text modified
Liliana Bravo-Monroy	17	463	20	568	<p>4.3.2 Economic growth. In spite of explicit cases are mentioned (Energy consumption and nitrogen loss indicator, lines 529-535; ecological footprint, lines 542-546 & 560-568), this section provides a panoramic view of the issue with an emphasis in economic indicators. It would be practical to include more information (e.g., by using a map or table) of particular cases/locations/countries where a reader could find a considerable overlap between economic growth and [substantial] reduction in biodiversity and ES. In line with this, it is important to also include cases happening at the local/national level since actions are taken at this scale and policies are addressed from the global/regional/subregional/national to the local/community levels.</p>	The emphasis of this regional assessment is on subregions, not individual countries. National case studies avoided here.
Marcelo Cabido	17	463	20	563	Perhaps a couple of Tables may help to reduce the length of the text in this section	Noted.
Pablo Zaldivar	17	463	26	746	It is important to set limits of consumption in relation to economic growth, and defining particularly in which economic activities.	Prescriptive language
Pablo Zaldivar/Miguel Equihua	17	463	17	466	The text confers socio-economic and environmental scenarios to economic growth. The text should discuss more on development rather than just the perception of economic growth. Also, it is important to note the difference between inequity and inequality.	This sections refers to economic growth as ID. Inequity is dealt with in section on human development (4.3.6)
Cristobal Diaz	17	464	17	464	I propose to change: "Economic growth is <u>one</u> of the main global driver of resource consumption....."	Accepted. Text changed.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		464			4.3.2. Economic growth: Resource consumption since 1960 has been driven by a combination of economic growth (about a factor of 5) and population growth (about a factor of 2.5) and associated changes in lifestyles. Therefore this sentence should be modified. Delete global.	Text changed
Numa P. Pavón Hernández	17	464	17	464	Definition of "Economic growth": increase in a country's productive capacity, as measured by comparing gross national product (GNP) in a year with the GNP in the previous year. Increase in the capital stock, advances in technology, and improvement in the quality and level of literacy are considered to be the principal causes of economic growth. Read more: http://www.businessdictionary.com/definition/economic-growth.html	Short definition included
Rodrigo Medellín	17	467	17	470	No clear message here!	Text changed
Liliana Bravo-Monroy	17	468	17	470	It would be helpful to highlight examples/cases/locations where the positive impacts have occurred.	Noted. Space limits.
Cristobal Diaz	17	471	17	471	I propose add: "...of those styles of economic growth that disregard social development and environmental goals, and affects ecosystem services. "	Examples included.
Virginia Meléndez Ramírez	17	472	17	472	GDP, GHG Add meaning of these acronym	Well known acronyms. We suggest to add them to list of acronyms for this Chapter.
Bob Watson		473			"trends"-This section should also discuss PPP (purchasing power parity) – a critical issue for resource consumption	New text included
United States Government	17	477	17	479	This information is redundant, given Table 4.1; consider revising or deleting.	Table 4.1 also integrates other data. No reference to emissions in Table 4.1
E. Arguedas y C. Roldán	17	481	17	482	Table 4.1. For this assessment tables and figures should use four subregions according to IPBES/3/18, Annex V, B. North America, Mesoamerica, Caribbean, South America. This comment applied for all figures and tables in this chapter.	New table that takes into account this.
Virginia Meléndez Ramírez	17	481	17	481	Table 4.1 Mention the total world population.	Added
Bob Watson		492			"output"-Show a table illustrating the differences and later assess the implications of different sectoral compositions on biodiversity and NCP	Information partially capture in table 4.3.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		502			"The Americas has experienced substantial economic growth since 1960. "- Need a table and figure of quantitative trends in economic growth since 1960 and projected to 2050	This information has been included in new table 4.1
Virginia Meléndez Ramírez	18	504	18	504	Add meaning of this acronym: LAC	We suggest to add them to list of acronyms for this Chapter.
United States Government	18	504	18	505	"although North American income grew from a substantially higher 1960 level" is not necessary to make the point; consider deletion.	It is factual complementary information.
Cristobal Diaz	18	524	18	528	I propose to explain the dependence of LAC economies to USA and Canada markets and for this reason the same fluctuations.	Text modified.
United States Government	18	531	18	533	These sentences could be perceived as biased; consider deleting or revising to reflect that nearly all developed countries have higher primary energy consumption relative to non-developed countries. Further, in this context, one country as an example relative to multiple countries is biased. The sentences could read: "Per capita consumption of natural resources is higher in more developed countries, including North America and OECD America countries, than non-OECD America countries. For instance, total primary energy consumption per capita for North America and OECD America countries was ___ v. ___ for non-OECD America countries in 2012."	USA data replaced with data for North America
Liliana Bravo-Monroy	19	536	19	541	It would be interesting to include what type of commodities are quantified.	General reference included. More details provided in the source of these data.
Co-chairs	19	538	19	541	Be complete. What percent of NA exports are commodities?	Reference introduced on the diversification index for North America and LAC regions.
Bob Watson		542		543	Table 4.2 - Define GDP intensity – what are the units	Explanatory note introduced to the table 4.2, for clarification.
United States Government	19	542	19	542	It would be useful to know how ecological footprint is measured.	WWF methodology
Co-chairs	18	544	19	546	We have no doubt tha the sentence is paraphrased corrected from the source. However, it is not tied to the rest of the message in this paragraph and the adjacent ones. If it is relevant, it needs to be tied better to the message trying to be communnicated.	Sentence deleted

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	19	548	19	550	This is an interesting enough table, and it is noted as coming from the Chapter authors. That is fine, but it has a very terse explanation and then the section moves on to another topic. If the table is not going to be used subsequently to explain patterns and trends in the rest of the chapter and in other chapters, it can be deleted - not because it is wrong, but it is not being used anywhere. and, as the paragraph below the figure says, the messages in the cells are themselves dependent on what is causing the growth.	This table summarizes the main linkages between GDP trends and their implications on BD. Some of these ideas have been also mentioned in other parts of the text.
E. Arguedas y C. Roldán	19	550	19	551	Table 4.2. Using the information of the assessment, the authors should include all countries in any category.	The emphasis of this regional assessment is on subregions, not individual countries.
Rodrigo Medellín	19	550	19	550	LOW	Text modified
Virginia Meléndez Ramírez	19	552	19	552	Meaning of Acronym BD, is in page 21 line 612	Clarified
Cristobal Diaz	20	565	20	Table 4.3 568	In this Table the data of the Caribbean taking into account only 4 countries isn't serious and lack countries with much weight in the sub-region: Dominican Republic, Barbados, Bahamas and the rest.	No additional info available in that report. Dominican Republic was added.
Bob Watson		565			table 4.3 - Define ecological footprint and describe how the numbers are calculated and averaged	Accepted
Bob Watson		565			Table 4.3- The text needs to explain why carbon intensity is important	New text added
Liliana Bravo-Monroy	20	569	22	629	4.3.3 International trade and finances. A summary/synopsis of Table 4.16 could be presented on this section. It is a more suitable section for that information.	To be checked by the CLAs.
United States Government	20	569	22	629	Much of the section addresses issues that are beyond the scope of IPBES' mandate (for example, the paragraph on foreign debt and foreign direct investment). Please revise and condense this section.	These are key drivers of changes in BD, as well documented in the existing literature.
Numa P. Pavón Hernández	20	569	22	629	In this section, I feel that it is necessary major discussion about how drivers is relating with Bd and ecosystem services loss.	Noted. This section on ID (underlying factors of change) and relations to changes in BD is not always evident. Other sections deal with DD and interrelations between ID and DD.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	20	571	20	573	but' in this context is biased; please change to 'and.' Also, please delete specific reference to USA and Canada, as this point refers to all of North America.	Accepted
Marcelo Cabido	20	575	20	576	OK, but the USA trade deficit is not due to the trade with the rest of America, but with China, Alemania, etc.	Noted
Bob Watson		577			"resources"- Use tables to illustrate how different economies economic activity depends on natural resources and how much of that depends on exports	General data on this, for the various sub-regions is provided in section on economic growth.
Liliana Bravo-Monroy	20	580	20	581	It would be interesting to include some details of what type of agricultural raw material.	Noted
Marcelo Cabido	20	581	20	582	Argentina exports between 22 and 26% of primary products (2011), that is not manufactured products at all	Noted
Cristobal Diaz	20	582	20	583	It isn't mentioned Venezuela that exports a big quantity of oil and is a big member of Oil Exporter Countries Organization	Accepted
Marcelo Cabido	20	583	20	585	That's true, but the nature (industrial vs. agricultural) of manufactured products differs substantially among countries	Noted
Margarita N. Lavides	21	591	21	591	Correct: 'affect' to affected	Accepted
Co-chairs	21	592	21	596	Be complete. What are the comparable figures for Na and Caribbean?	This is an example. No data available for all the Americas.
Co-chairs	21	601	21	604	Explain a bit more. Readers may look at the table and think that if these LAC countries are not major players in the global trade statistics, then they should not be very exposed to fluctuations in those markets and flows. This would make them <i>less</i> vulnerable rather than more vulnerable to changes in the markets, because of the low exposure. The reason could be that the low percentage of global trade shown in the table may still be a high percent of a small national economy. But one has to know a lot of information that is not apparent in the table.	Table 4.4 modified to address this concern.
United States Government	21	601	21	603	This sentence does not have any clear connection to IPBES' mandate and is unnecessarily political. Please delete.	This is an economic analysis.
Ederson A Zanetti	21	607	21	611	There should be other examples like the pulp & paper sector in Brazil, wood construction in the USA and Canada, Brazilian nuts all over the Amazon region. Only soya bean seems to narrow the subject	Request for adding examples.
Liliana Bravo-Monroy	21	607	21	611	It would be helpful to include more cases such as soybean crops. Thus there is more illustration of the concordance between international trade, trade policies, incentives and land-use change.	Request for adding examples.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	21	607	21	611	this is written in a very negative tone. As written it reads as if the poverty and ecological devastation were <i>necessary</i> consequences of the export policies and exchange rates. With other domestic policies in place the negative consequences could be mitigated and probably avoided completely. So the problem is not international trade per se, but the domestic policies in place. It is fine to present the linkage of policies and practices from international trade to local community impacts. But it is unbalanced and misleading to present the linkages as causal and unavoidable. Trade is not inherently negative. It is how States choose to participate in it.	This paragraph refers to trade and monetary (domestic) policies, not to trade in general.
Marcelo Cabido	21	614	22	625	Data are provided concerning two of the indicators in Table 4.5, but not for the others	For illustration purposes.
Cristobal Diaz	21	614	21	620	In the case of foreign debt isn't included the USA, the bigger in the World	Text modified, including foreign data for USA and Canada.
Cristobal Diaz	21	621	22	625	We would try to actualize the data of foreign direct investments (FDI) to LAC region because we have data of 2014 year and maybe the situation change for 2015 and 2016	Data updated
Bob Watson		622			table 4.5- in option 1: High prices, high debt, high FDI. In option 2: Low prices, low debt, low FDI	Clarification added
Ederson A Zanetti	22	626	22	626	There should be also fiscal policies	This refers to international trade and financial markets
Liliana Bravo-Monroy	22	626	22	629	Table 4.5 provides interesting information about trade & finance indicators. It would be suitable to also include concrete cases or examples of the effect of those issues on what categories/ levels/scales/components of biodiversity and ES are we talking about.	Request for adding examples.
E. Arguedas y C. Roldán	22	626	22	629	Table 4.5. ¿Is it possible to the authors to link the potential pressures on biodiversity with the sub-regions?	Subregional information is not always useful in this regard.
Diego Pacheco	22	630	25	746	There is the need to introduce in the discussion of the technological development, the traditional technologies related to indigenous peoples and local communities, belonging to ILK. I would suggest to summarize better the discussion and findings regarding the technological development.	The text includes general reference to agroecology. Requesting additional examples.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	22	630	26	746	It would seem no apparent connection between two main topics in this section. Firtsly, Science & Technology indicators and then broad generalities of some agricultural technologies (e.g., Green revolution, agroecology) including intellectual property. It would be suggested to focus on what type of technologies are being considered in relation to land-use changes. Furthermore, it would be practical to make comparisons in time and space by using real cases. For instance, the introduction of a particular technology (e.g., green revolution, genetic modified crops, biofuels, agroecology, ecological intensification, etc.) into emblematic places (of North, Meso, South America and the Caribbean) at a particular date. What happened years later in terms of biodiversity and ES, with the area and surroundings with that introduction?	Requesting for adding examples
Liliana Bravo-Monroy	22	630	26	746	In line with the above suggested, it would be also informative to include current and historic data of land use, for instance land area under agriculture (monocrops and livestock) and natural habitats per sub-region.	There is another section on LU as DD.
Bob Watson		630			4.3.4.Technological development - I have major difficulties with this section. The wholem discussion is toittally simplistic and misleading. The text must focus on R@D that relates directly or indirectly to biodiversity, ecosystems and NCP – most R@D does not impact these issues – a total rewrite is needed. So focus on technological and R@D issues related to land management, e.g., agriculture, fisheries,	Note added to the table. LU issues, as DD, are treated in another section.
United States Government	22	630	26	745	Much of the section addresses issues that are beyond the scope of IPBES' mandate (for example, the sections on technological change). Please revise and condense this section. In doing so, please make the connections to IPBES and this assessment clear.	This section is on ID (underlying factors of change) and relations to changes in BD is not always direct/evident. Other sections deal with DD and interrelations between ID and DD.
Numa P. Pavón Hernández	22	630	24	686	It would be interesting to have one, but a short commentary, on what could be expected before information age in the new Knowledge age.	Noted
Marcelo Cabido	22	631	23	654	This section comprises a group of loose paragraphs rather disconnected among them	Noted. Parts of the text have been modified.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Marcelo Cabido	22	631	26	746	This section could be reduced to perhaps 50 % of its present length. Some of the tables could be eliminated since much of the information is also provided in the text. Also, especific effects of technological development on biodiversity and NBPs could be more explicitly presented.	Noted. This section is on ID (underlying factors of change) and relations to changes in BD is not always direct/evident. Other sections deal with DD and interrelations between ID and DD.
United States Government	22	633	22	634	This sentence does not have any clear connection to IPBES' mandate and is unnecessarily political. Please delete.	Rejected. General statement supported by relevant literature.
Co-chairs	23	637	23	640	Provide statistics of at least just the Americas, and if possible for the different subregions. Of the latter s feasible then the current size of the middle class by subregion as well as the expected in 2050. That would make the informaton meaningful to this assessmnet.	This information has been moved to the section on Population and demographic trends.
Bob Watson		637			"The global middle class is expected to grow from 1.8 billion in 2009 to 4.9 billion by 2030" - This is the type of information that should be in the section on demography	This information has been moved to the section on Population and demographic trends.
Bob Watson		641		643	"The acquisition of new power sources together with accompanying shifts in social-ecological interactions stand at the basis of major social-ecological transformations and regimes: domestication of fire, domestication of plants and animals, and industrialization (Goudsblom 2015).- "I have no idea what the message is	Accepted. Text removed.
Bob Watson		644			"change"- The text should not that technological change can be beneficial or negative for biodivbersty, ecosystems asnd NCP, asnd highly unlikely to be a linear relationship	This message has been already mentioned.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		651		652	Table 4.6- This table is totally misleading – it is critical to dis-aggregate these R&D numbers. It is vital to differentiate between military R@D from non-military R@D, and Government R@D from private sector R@D. The US numer includes a high percentage related to military research, development and demonstration. Also much private sector research is totally unrelated to natural resources, e.g., communications, computing, pharmaceuticals. Even with the non military R@D needs to be separated into R@D that can directly or indirectly effect biodiversity, ecosystems and NCP from research that is totally irrelevant to these issues. Equally the number of researchers needs to be dis-aggregated.	New note introduced to the table.
Marlín Pérez Suárez	23	657	24	688	Table 4.6 and Table 4.7 What happens with Brazil and Mexico?? There is no mention of this, in previous chapters these countries use them as can examples	Noted. T4.7 was deleted
Patricia S. Vazquez	24	658	24	658	Figure 3. 4. Species richness trends across the Americas. Within this Figure 1.2 and 1.6 do not present legend, it would be good to consider adding this for a better interpretation of the data and that everything is in the same format	Misplaced comment??
United States Government	23	666	24	672	As the U.S. Patent and Trademark Office (USPTO) is used as the data source for this information, it makes sense that the majority of patents would fall within the national boundaries of the U.S. federal agency. Thus, the information and the mention of 'persisting gaps regarding science, technology and innovation in the Americas' is biased; please delete altogether or revise with more widely encompassing data.	These are UNESCO statistics. Note was added to the table on this. Other S&T indicators also reveal gaps.
United States Government	24	669	24	671	Rather than "contributed with," suggest that the USA "accounted for..."	Accepted
Bob Watson		679		681	"Technological innovation can catalyze paradigm shifts in production systems (Pérez 2004, quoted by IPBES 3c, 2016) that cause biodiversity loss and adverse ecosystems changes, or conversely reduce biodiversity loss and improve ecosystems health.- "No substance in this paragraph	Clarifying text added.
Cristobal Diaz	24	683	24	683	I suggest include: "..., but unsustainable technological change can also increase pressure on ecosystem services....."	Already considered in the example used in this paragraph.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	24	688	Table 4.7		the table caption says "Some indicators linking technological development and environment in the Americas" However it only lists a series of indicators by country or group of countries. It does not show any <i>linkages</i> between the cell entries. The causal linkages between the columns should be documented or the table deleted.	Table 4.7 was deleted
Bob Watson		688		690	Table 4.7- Totally misleading – delete - see earlier comments – there is no causal chain between R&D as a percentage of GDP and natural resources depletion, forest area and degraded land	Table 4.7 was deleted
David Loreto	24	691	24	696	Review how resilience is conceptualized as it seems to be equated with risk, which is wrong and on the other hand, by establishing that crop resilience can be improved would be missing then (If there is one) some evidence about the values of the thresholds of such resilience in crops.	Checked. Existing text is correct.
Ederson A Zanetti	24	691	24	692	There should be mention to silviculture. All along the previous texts agriculture has been emphasized and the figures and comments include forestry. This is the first part of the text where I see that agriculture is not including wood pulp, wood paper, wood construction and wood energy, which are usually included within agriculture GDP results	This paragraph only refers to examples.
Cristobal Diaz	24	691	25	722	Please, take care because biodiversity and ecosystem services is much more than agriculture and other technological changes would be explained	This is an example
David Loreto	24	691	24	696	Review how resilience is conceptualized as it seems to be equated with risk, which is wrong and on the other hand, by establishing that crop resilience can be improved would be missing then (If there is one) some evidence about the values of the thresholds of such resilience in crops.	Checked. Existing text is correct.
Ederson A Zanetti	25	697	25	706	there should be mention to consumption of wood products and cultivation of tree species and others	General analysis.
Co-chairs	25	707	25	711	This is more categorically negative than the original FAO source that is cited. As the very next paragraph states (line 712) the sustainability or unsustainability of aspects of the "green revolution" depend crucially on how the technology is implemented. Just phrasing the message as "practices based on increasing dependence" is not sufficiently clear in acknowledging that many aspects of technology in agriculture do not need to lead to "increasing dependence".	Text modified

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	25	707	25	711	This sentence is misleading and contradicts earlier acknowledgements that there are pros and cons associated with modern agriculture's impact on the environment. Consider instead: "While inappropriate use of external inputs may be unsustainable, responsible use of external inputs can lead to sustainable intensification of agricultural production systems and allow farmers to grow more food using less land."	Text modified
Co-chairs	25	712	25	722	these two paragraphs are uncomfortable colse to beig policy prescriptive rather than policy relevant. They do not quite say Agroecology is better than "green revlution", but they are written so only negative things are said about one option and only positive things are said about the other. This is not a balanced presentation of the policy choices, and it is not as balanced a treatment as the FAO report that is being cited.	Text modified
United States Government	25	712	25	714	The FAO quote is inherently political and detracts from the scientific focus of IPBES. Please delete.	Text modified
María Evelinda Santiago Jiménez	25	712	25	712	Policies will be in the field of sustainability if they manage to make ethical analyzes and assessments of the externalities and the impacts of the green revolution.	Noted
Brenda McAfee	25	723	26	746	This paragraph could be simplified and condensed to focus on how monocultures are impacting biodiversity and ecosystem services, particularly genetic diversity of crop species.	This section refers to several key relevant issues. Text re-written as an assessment rather than a review.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		723		746	<p>This issue is an important issue but needs a more balanced discussion and needs to be written as an assessment not a review- "In his book on intellectual property, biodiversity, and sustainable development, the economist Martin Khor discusses the misappropriation of traditional biodiversity knowledge or 'biopiracy', citing it as one of the most 'complex problems facing the future of traditional knowledge' (Khor, 2002; quoted by Trace, 2016: 165). Khor argues that the system of community sharing and collaborative innovation is being challenged by IPR and the TRIPS regime, which together create a new system to exert private ownership rights over knowledge (Trace, 2016: 165). The intersection between agriculture, trade, and intellectual property governance is marked by a diversity of institutions involved, including the World Trade Organization (WTO), the World Intellectual Property Organization (WIPO), the Convention on Biodiversity (CBD), and the Food and Agriculture Association (FAO). On balance, the corporations have the upper hand in this complicated game (Sell, 2009). A combination of expanded intellectual property rights and relaxed antitrust enforcement facilitated a recent shift from public to private provision of seeds which is undermining small farmers' tradition of saving seeds and reusing seeds. In this and other ways, the current situation is marked by underinvestment in crops and technologies suitable for smallholder farmers. In agri-biotechnology, six companies alone hold 75 percent of all US patents granted to the top thirty patent-holding firms: Monsanto, DuPont, Syngenta, Dow, Aventis, and Grupo Pulsar (Dutfield 2003a, 154; Fowler 1994, 146). The top ten seed companies control over half of the global seed market (ETC Group 2008b, 1) and are contributing to monoculture and associated loss of biodiversity in Latin America. This institutional dominance of TNC [transnational corporation] facilitates "gene grab" (Sells 2009), with negative effects on biodiversity, competition, and food security to the extent that it prevents resource sharing and locks out</p>	<p>This section refers to several key relevant issues. Text re-written as an assessment rather than a review.</p>
United States Government	25	723	25	746	<p>This section is unbalanced and beyond the scope of IPBES. Please delete.</p>	<p>This section refers to several key relevant issues. Text re-written as an assessment rather than a review.</p>

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
María Evelinda Santiago Jiménez	25	723	25	728	While it is true that traditional knowledge is a good of humanity, being "expropriated" and "improved" should not become an innovation, and therefore it should not be patented. Consideration should be given to building collective knowledge and paying worthy royalties to the Peoples. Via Campesina is an international peasant movement which fights for food sovereignty: https://viacampesina.org/es/index.php/organizaciainmenu-44	Noted
PhD. María Evelinda Santiago	25	723	25	746	It is important to clarify in a very specific way that when traditional knowledge is "expropriated" and transferred to the good of humanity, the word "innovation" must be deeply reflected. This would imply a redefinition of the word innovation; and maybe don't use it.	Noted
Virginia Meléndez Ramírez	25	739	25	739	Include to the transgenic crops, a graph	Resquesting additional graph.
José Luis Echeverría/ César Azurdia/ Melisa Ojeda	26	743	26	746	there may be expose some information about reserach on biotecnology for improve grains, like beans or maize, for biofortification to provide food security in countries like Mexico and Brazil, it's development is by the goberment institutions for provide free seed for the people, and not only by TNC.	Noted
Liliana Bravo-Monroy	26	748	28	817	As mentioned, there is a lack of information that deepen mechanisms/cases/examples/locations linking biodiversity and ES to indirect drivers, in this case population growth. Thus it would be suggested taking into account subjects as the following: <ul style="list-style-type: none"> a) Widening data/cases that illustrate correlations between specific areas with loss of biodiversity (e.g., Amazonian rainforest) and human poulation rates including data about percentage of urban areas, GHG emissions, others; b) Correlations between human population size and biodiversity indicators (e.g., species richness) in at least two time periods; c) Accelelated human population growth at protected area edges (See for instance, Wittemyer et al 2008); d) On the other side, another study might be of interest: Maurer (1996) outlines a connection based on estimates of the fraction of solar energy fixed by photosynthesis that is consumed by humans. Would there be today similar or contrasting findings? etc. 	Request for adding examples.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		748			section 4.35: "Population and demographic trends- Trends need to be expanded – need changes since 1960 and projected to 2050, also other information on age distribution and % in poverty and % in middle class	Most of the requested information was included in new tables 4.7 & 4.8. Data on poverty is covered in section on human development.
United States Government	26	748	27	793	Please condense and make the connection to IPBES more clear.	This section is on ID (underlying factors of change) and relations to changes in BD is not always direct/evident. Other sections deal with DD and interrelations between ID and DD.
Numa P. Pavón Hernández	26	748	26	748	Is it the most important driver?	Relevant literature include population as a key driver.
Marcelo Cabido	26	749	28	817	Again, as in the previous section, almost no explicit mention to the effects of population and demographic trends on biodiversity are included neither the mechanisms underlying those eventual effects.	This section is on ID (underlying factors of change) and relations to changes in BD is not always direct/evident. Other sections deal with DD and interrelations between ID and DD.
Co-chairs	26	754	27	771	Are the area figures corrected in any way for inhabitable spaces? There may be no way to readily compensate for the amount of mountainous, desert and tundra/icefield areas (which can support humans, but only at low densities relative to grasslands, forests etc. But the text and table should at least warn that the area and density figures do not take this consideration into account.	Footnote added.
Cristobal Diaz	26	754	27	772	Take care with the % of world population that live in The Americas because exists differences in the numbers written from 754 to 756 with Table 4,1, Table 4,6 and Table 4,8	Double-checked.
United States Government	26	758	26	760	Please clarify that the population (not the land base) is highly urbanized.	Accepted
Numa P. Pavón Hernández	26	760	26	760	In the chapter some statistical of Greenland were included. However, it is not clear if consider it as a country of Northamerica, but it has no considered it in the information of the tables.	Consulted sources include data on Greenland population as part of the population of the Americas.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		766		768	Table 4.8- This table needs to be complemented with a longer term perspective, i.e., 1960 to present., and one of projected plausible changes	Included in new table 4.8
Marlín Pérez Suárez	27	770	27	770	Table 4.9 What happens with South America? There is no mention of this	New tables 4.8 & 4.9 include South America.
Diego Pacheco	28	796	28	797	This table does not necessarily introduces more clarity to the discussion of population growth and is not needed.	Other reviewers ask for strengthening this table.
Liliana Bravo-Monroy	28	796	28	798	Table 4.10 Information described on this table would be strengthened by providing more details (locations, biodiversity indicators, population rates, etc.)	Request for adding examples.
E. Arguedas y C. Roldán	28	796	28	798	Table 4.10. ¿It is possible to the authors to categorize sub-regions ?	Subregional information is not always useful in this regard.
Cristobal Diaz	28	797	28	798	I suggest include the unsustainable production and consumption patterns in Low Population growth / High Per capita consumption and High Population growth / High Per capita consumption. They factors realice negative pressure over BD, and ES	Self-evident
Bob Watson		797			table 4.10 "high population growth/high per capita consumption"- High per capita consumption of what??? – not all consumption has implications for natural resoures	Of natural resources (See caption of the fig)
Rodrigo Medellín	28	797	28	798	Disagree. If you have high population growth the population is increasingy demanding natural resources and putting pressure on BD, precisely for survival reasons	Per capita consumption of natural resources also matters.
Cristobal Diaz	28	800	28	817	The paragraph from 800-806 is repeated from 811-817 too	OK
Cristobal Diaz	28	800	28	806	I suggest to mention the perspectives in North America although the level of rise is small, remember the migrations.	New data include reference also to North America
United States Government	28	800	28	817	These paragraphs are direct repetitions; please delete one.	OK
Co-chairs	28	803	28	806	And what is projected for NA and caribbean. IPCC AR 5 has GHG emissions projections that should have the necessary informaton for at least NA, and should be included.	Text modified
Marcelo Cabido	28	807	28	810	This paragraph is repeated; see lines 749 to 753	OK
Co-chairs	28	807	28	823	Both of these paragraphs have already appeared and should be deleted here.	OK

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		807		817	Redundant text with lines 739-742 and 808-814: "Assessing human demographic trends and their implications for nature and nature benefits to people and good quality of life, includes consideration of total population and age structure; urban vs. rural populations and urban forms; information on locations, like coastal vs. inland, migration flows, among other indicators. Population growth projections for Latin America, Brazil and Mexico range from 10 to 50% between the years 2010 and 2050. At the same time, GDP per capita projections range from a mere doubling to a quadrupling of 2010 levels by 2050. This results in a 2–3 fold increase in primary energy use, leading to a 2–4 fold increase in CO2 emissions from energy and industry between 2010 and 2050. Core baseline scenarios indicates that the projected increase in GHG emissions in Latin American countries is mainly driven by GDP growth, population growth and a slight shift toward more carbon intensive fuels, and dampened by reductions in energy intensity (Ruiiven et al. 2016)." - delete	Ok
Rafael Calderón-Contreras	28	807	28	810	An example as the way in which the different considerations mentioned could itneract to produce different NCP could be useful. I. E. the role of urban areas for the provision of NCP could help providing better policies.	Requesting for adding examples
DPG/Sbio/MMA	28	811	28	817	Same text in lines 800 to 806.	OK
Marcelo Cabido	28	811	28	817	This paragraph is repeated; see lines 800 to 806	OK
Rafael Calderón-Contreras	28	811	28	817	Population growth projections differ from general to urban. It might be necessary to provide a more specific ilustration as to how the increase in population is mainly related to urban dwellers. This situation implies a wide array of challenges that have to be addressed.	New table 4.9 includes more detailed information on urban population.
Rodrigo Medellín	28	811	28	817	Repeated from just above	OK
Bob Watson		816			"a slight shift toward more carbon intensive fuels"- Can this be defended given all Latin American countries have either signed or ratified the Paris agreement	Text modified
Ederson A Zanetti	28	817	28	817	There should be mention to the work done by CEPAL/EUROCLIMA on GHG emissions and risks over the region	Text modified

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Diego Pacheco	28	818	32	938	Welfare and human development is not well aligned to the IPBES conceptual framework which refers to the good quality of life. Therefore, I suggest to change this maybe to human development, since most of the discussion is about HDI (human development index). I suggest also to introduce the issue of poverty (by income and unsatisfied needs) and acces to natural resources, including the situation of indigenous peoples and women.	Accepted
Liliana Bravo-Monroy	28	818	32	938	As mentioned, there is a lack of information that deepen mechanisms/cases/examples/locations linking biodiversity and ES to indirect drivers, in this case human development.	Request for adding examples.
Liliana Bravo-Monroy	28	818	32	938	It would be interesting to provide reasons/examples/cases or evidence that support generalities mentioned through the section. For instance in relation to extractive industries (line 889), broader societal factors (lines 890-895); Indigenous and local knowledge (lines 914-938).	Request for adding examples.
Liliana Bravo-Monroy	28	818	32	938	On the other side, there is a large body of research that documents different perspectives linking social development dynamics and biodiversity at local scales. It would be suitable to provide an overview of those multiple perspectives that exist across The Americas continent. See for instance, non-timber forest product (NTFP) and rural communities (Dawson et al. 2014); social perceptions of environmental changes and local development at the scale of a watershed (Gandin 2012); management and sustainable livelihoods associated with a particular palm species (Virapongse et al. 2017); etc. etc.	Request for adding examples.
Cristobal Diaz	28	818	32	939	I don't know if it is the best place to analyze the remittances as factor of welfare to the population and the reduction of negative impacts over the environment. If it isn't here maybe analyzed in all this over economic from point 4.3.2 to 4.3.6, but would be analyzed	Implicitly considered underf financial flows.
United States Government	28	818	32	938	Please make the connection between this section and IPBES' mandate more clear. Section could also be streamlined and condensed.	New text in this regard.
Marcelo Cabido	28	819	32	938	This section should summarize the effects that human development is having on biodiversity and NBPs, but I believe it just describes some statistics and refer to the relevance of considering local and indigenous knowledge, without explicitly mentionig how and why welfare and human development should be considered as drivers of change.	New text in this regard.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Virginia Meléndez Ramírez	29	820	29	820	This is confusing, there is data for Mesoamerica and Latin America	See comment No. 336
Bob Watson		829		872	<p>This material is more relevant in chapters 2 and 6 – if it stays in this chapter it must be linked to the implications for natural resources – also the text could be shortened to a few sentences and replaced by a table -</p> <p>"Mesoamerica shows the lowest regional Human Development Index (HDI) in 2014 in the Western Hemisphere, below the average levels for LAC countries (0.7240), for the Americas (0.7349) and the world (0.7110). Haiti reveals the lowest level of HDI in the Americas (0.4830), even below the corresponding level for Sub-Saharan Africa (0.5180). Inequality Adjusted HDI in the Americas is considerably lower than HDI (by 22.2%): in LAC countries by 23.5%; and in North America by 12.9% (Table 4. 11).</p> <p>Country-specific HDI values and trends indicate that most countries of the Americas rank as “very high” or “high” human development within the world community. However, four Mesoamerican and three South American countries have HDI values that rate their human development as “medium” within the world community, while Haiti’s HDI falls very low in the world rankings (UNDP, 2016).</p> <p>Throughout the Americas, with the exception of Cuba during 2010 to 2015, all countries’ HDI values improved from 2000 to 2015, representing widespread regional gains in incomes, education, and socioeconomic factors that increase life expectancy. Even with the increases in country level HDI scores, 18 countries in the region fell in the worldwide rankings between 2010 and 2015, indicating a failure to match gains in human development at a more international level. Of these 18 countries, half are in the Caribbean sub-region.</p> <p>According to UNDP (2016), Cuba (48 points) and Barbados (20 points) lead the list of countries of the Western hemisphere where the “GNI ranks minus HDI rank” shows positive results, indicating that their human development achievements go far beyond those associated to their gross national income: due to, for instance, more efficient allocation of economic</p>	It refers for instance to poverty and gaps in human development as driver of BD loss.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		864		872	Again, this issue needs to be related to the implications for natural resources and NCP - "Historically, the needs and priorities of indigenous peoples in the Americas have been ignored to a great extent, mainly affecting indigenous women. This situation has started to change in recent past, at least in some LAC countries. By 2010, about 45 million indigenous people (8.3% of the regional population) lived in Latin America, compared with an estimated 30 million in 2000, an increase that is a result not only of population growth but also of the greater visibility of this population in the national censuses. On average, without distinguishing educational levels, the labor income of non-indigenous and Afro-descendant men quadrupled those of indigenous women and almost doubled those of Afro-descendant women. In 2009-2013, around 235 conflicts were identified in Latin America, generated by projects of extractive industries (mining and hydrocarbons) in indigenous territories (CEPAL, 2016)."	See, for example, the last sentence of this paragraph.It
Marcelo Cabido	30	869	30	869	The number is 23.3% according to the World Bank, but I believe the figures given by CEPAL are more trustable.	CEPAL data included
Virginia Meléndez Ramírez	30	869	30	869	This is confusing, there is data for Mesoamerica and Latin America	Mesoamerica & South America as LAC sub-regions.
Co-chairs	30	875	30	884	It is valuable to report this informaton. However the baseline for "poverty" in these statistics is probably not the same baseline as "poverty" in the preceeding paragraphs. The difference in baseline should be explicitly reported so proper inferences can be drawn from the section as a whole. Canadian and Greenland data should also be repored in this paragraph, to make it comparable to how SA, MA and Car are presented.	Data for USA and Canada added.
Marcelo Cabido	30	878	30	880	I can't precisely understand the figures for African American and Native American poverty rate, neither the percentages given.	Text removed
United States Government	30	879	30	880	As other subregions and countries do not have poverty rates broken down by specific portions of the population, please be consistent across the treatment of the regions only reference the overall U.S. poverty rates.	Text removed

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	39	881	30	882	It is certainly appropriate to report that indigenous women are even more economically disadvantaged than indigenous men. However the phrasing "mostly indigenous women" says that most of the indigenous people who are disadvantaged are women, which directly implies not nearly as many indigenous men are disadvantaged. That is not correct. Indigenous people of both genders are greatly disadvantaged, on average, and women even more than men. Correct the phrasing.	Quoted from CEPAL ("mainly indigenous women").
Co-chairs	30	881	30	889	There are more than 6.6 million Indigenous People in the US and Canada, and even though the absolute numbers are small in Greenland, Inuit people comprise about 90% of the population. These peoples, and peoples of Afro descent in NA also must be reported and their status comparably presented. This is an assessment of the Americas, not just Latin America.	Data for USA and Canada added.
United States Government	30	881	30	883	"at least in some LAC countries," excludes mention of NA; please revise and/or include mention of the NA as making notable progress as well.	Text modified
Pablo Zaldivar	30	881	30	889	The chapter fails to include the effects of extractive projects on biodiversity and indigenous communities.	Section on economic growth and trade!
Cristobal Diaz	30	882	30	883	In the text is written: "This situation has started to change in recent past, at least in some LAC countries ". HOW? This would be explained because it is important part of welfare and human development.	As a result of the global concerns on the situation of these peoples.
Melanie Kolb	30	888	30	889	Provide examples of mining affectation to the provision of services: quantity and quality of water.	Section on economic growth and trade!
Co-chairs	30	894	31	900	This topic is covered in Chapters 2 and 3, where it is more relevant, and the text and figure should be deleted here. Chapters 2 and 3 should be provided the figure so if the information is not already covered, it can be added.	Figure moved to Ch 2

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Krista Locs	30	896	32	938	Suggest including a reference to Target 15 of the 2020 Biodiversity Goals and Targets for Canada " <i>Target 15: Aboriginal traditional knowledge is respected, promoted and, where made available by Aboriginal peoples, regularly, meaningfully and effectively informing biodiversity conservation and management decision-making</i> ". Also suggest including the indicators: "Number of mechanisms in place for Aboriginal traditional knowledge (ATK) to inform decision-making; Case studies assessing effectiveness of established mechanism for ATK to inform decision-making; Case studies illustrating best practices in promoting ATK or having it inform decision-making; Trends in linguistic diversity and number of speakers of Aboriginal languages". Reference is available at: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1&offset=3#target_15	Request for adding examples.
Krista Locs	30	896	32	938	Suggest including a reference to Target 12 of the 2020 Biodiversity Goals and Targets for Canada " <i>Target 12. By 2020, customary use by Aboriginal peoples of biological resources is maintained, compatible with their conservation and sustainable use</i> ". Also suggest including the indicators: "Number of households participating in traditional activities; consumption of traditional foods; case studies illustrating customary use of biological resources". Reference is available at: http://biodivcanada.ca/default.asp?lang=En&n=9B5793F6-1&offset=2#target_12	Request for adding examples.
Marlín Pérez Suárez	31	899	31	900	Figure 4.2 Improve resolution	Figure moved to Ch 2
Virginia Meléndez Ramírez	31	900	31	900	Fig. 4.2 put the variable on the Y-axis	Figure moved to Ch 2
DPG/Sbio/MMA	31	914	31	914	Instead of "Indigenous and local knowledge", we suggest "indigenous and local communities traditional knowledge" in harmony with the Convention on Biological Diversity (see art. 8j) and Nagoya Protocol.	Text modified
Co-chairs	31	914	32	923	Similarly, this material is covered in Chapter 1 and should be deleted here. Chapter 1 can be given the text and referenes to incorpoarate as needed.	To be checked by the CLAs.
Bob Watson		918			This is not assessment language- "Alexander et al. (2011) recall that traditional ecological knowledge (TEK) can be found all over the world, "	Text modified

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
David Loreto	32	924	32	928	Review the cited author on socio-cultural resilience since in this report resilience is taken as resistance and / or adaptation, which is wrong, therefore it is suggested to search for and cite specific case studies on critical cultural factors that contribute to resilience in general, since these factors differ from one context to another and according to scale and time, and it should also be understood that these factors form part of the socio-ecological system as a whole and therefore contribute to resilience in general.	Noted
DPG/Sbio/MMA	32	924	32	938	This section of the study is very focused on indigenous peoples as holders of traditional knowledge (TK) on biodiversity. The national ABS legislation recognizes 3 groups of TK holders: indigenous peoples, traditional communities and traditional farmers (or small farmers). Brazil has a great diversity of traditional communities. The National Council of Traditional Peoples and Communities (CNPCT) has the representation of about thirty types of communities with specific traditional knowledge and practices that also contribute to the conservation of biodiversity (Decree 8,750, 2016). Some examples are: extractivists, raizeiros, geraizeros, caiçaras, faxinalenses and ribeirinhos. It is noted that these groups, not only the indigenous groups, are covered by Articles 8j and 10c of the CBD. This study is lacking in contributions from these other actors. It is a bias of this whole chapter. We suggest supplementing the information at least with examples and references of contributions from other groups, some of them are also present and <u>relevant for conservation in other countries</u> .	Request for adding examples.
Co-chairs	32	924	32	938	And this is all material for Chapter 2. It is about well-being, not about drivers. Provide to Chapter 2 for their inclusion.	Reference to the driver must be kept here. To be checked by the CLAs.
Virginia Meléndez Ramírez	32	924	32	924	The paragraph can be started with the example in Mexico: see Toledo and Castillo (1991), Indigenous people live in areas of high diversity: https://www.uv.mx/personal/tcarmona/files/2010/08/Toledo-y-Castillo-1991.pdf	Request for adding examples.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
David Loreto	32	924	32	928	Review the cited author on socio-cultural resilience since in this report resilience is taken as resistance and / or adaptation, which is wrong, therefore it is suggested to search for and cite specific case studies on critical cultural factors that contribute to resilience in general, since these factors differ from one context to another and according to scale and time, and it should also be understood that these factors form part of the socio-ecological system as a whole and therefore contribute to resilience in general.	Comment repeated
Brenda McAfee	32	927	32	927	Be more specific as to what "all this " refers to.	Text modified
Brenda McAfee	32	929	32	938	These paragraphs require clarity to identify the driver of change	Text modified
Bob Watson		929			Not assessment language -"According to"	Text modified
María Evelinda Santiago	82	936	82	938	The importance of education in all its contexts as a deconstructor of labels and catalyst of changes to include ethical valuation in the construction of knowledge and artifacts.	Noted
María Evelinda Santiago Jiménez	32	936	32	938	The distribution of knowledge by official institutions, such as the School, disperse labels and thoughts on the holders of traditional knowledge. Knowledge has to go through a process of decolonization so that scientists and technologists lower the curtains of the methodologies of their disciplines so that they understand the value of traditional knowledge and include it. This would give them a wider picture of the uncertainty and complexity of environmental and social issues.	Noted
Numa P. Pavón Hernández	32	936	32	938	I think that this paragraph need to discuss about relationship between these direct drivers and biodiversity loss.	Noted
Bob Watson		940			4.4. Direct Anthropogenic Drivers- Each of the direct drivers need to be quantified – historic changes, current trends and projected	
United States Government	32	940	32	940	Please be consistent with the use of bold phrases through the assessment.	
Diego Pacheco	32	941	32	1516	There is the need to summarize this part of the section and to highlight better the main findings regarding habitat degradation and restoration by biomes. There is the need to highlight better the drivers affecting degradation and restoration, such as land use change and agriculture and others. I suggest more use of infographics in order to improve comparison among subregions in America. Also, the contributions of ILK to restoration must be better pointed out and reflected.	I recommend we add a figure to address this comment

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	32	941	49	1516	The use of historic and current maps would be very useful through the section.	It might not be possible to add many more maps, given space constraints
Cristobal Diaz	32	941		1073	The text is dedicated mainly to flora(forest, agriculture and others) and nothing to fona(animals)where exists the necessity of analyze.	This is incorrect. References, such as Moreno-Mateos et al. 2017, include both plants and animals. If we are allowed to add more references, we could also add Tilman et al. 2017 Nature, which focuses exclusively on animals.
Bob Watson		941			4.4.1. Habitat Degradation and Restoration - This section is very poorly structured – please restructure one issue at a time	We decided to structure with an overview, followed by a discussion by region and biome within region, rather than organize by issue.
Liliana Bravo-Monroy	32	942	49	1516	An introductory section (lines 942 to 1081) presents very general information and sometimes is dispersed. That seems a descriptive text that summarises particular driving forces of the general driver "Habitat degradation". Turning to the habitats per sub-region (lines 1082 to 1516), text keeps a descriptive and presumably dissociated character from introduction. A challenge could be therefore unifying both parts of the section by analysing/connecting the effect/impact of mentioned factors/pressures (e.g., urbanisation, agricultural practices, resource consumption, land use change, external inputs) on specific habitats according to subregion, making reference of spatial and temporal scales being examined.	Personally, I like the current structure, which begins with a general overview and then flows into a region-specific detailed discussion.
Marcelo Cabido	32	942	36	1072	This section (Habitat Degradation & Restoration) is made up of several paragraphs each one dealing with a particular feature of land degradation, and some of these paragraphs encompass different topics (for example see from line 1037 to 1048). Restoration receives much less attention and paragraph from line 1062 to 1071 sounds rather contradictory (is it worth restoring or not?)	You will need to decide whether we can and should add more text on restoration
Virginia Meléndez Ramírez	32	950	32	950	Complete for Puerto Rico.	I do not understand this comment

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Numa P. Pavón Hernández	32	953	33	967	More information on soil salinization will be appreciated.	I could add a sentence on salanization, but this does not seem like the place to do so, given that this is the overview section.
Co-chairs	33	958	33	959	For Puerto Rico and the Lesser Antilles there is an explicit reporting the conversion of agricultural land to forest. For NA there is just a report that agricultural lands decreased 9% but no indication of what happened to the land. The sequence of sentences invites an interpretation that the abandoned agricultural lands in NA also went to forests. If that is not the case (for example, agriculture to urban) say so explicitly.	Changed as suggested
Numa P. Pavón Hernández	33	968	33	968	"According to FAO in 2013..." Not included in the references.	Full reference for FAO data is needed
Bob Watson		972		973	Please provide projected areas and trends- "by temporary crops, pasture, or hay meadows. "	CLAS need to sort out whether this belongs here or elsewhere in this report
Co-chairs	33	974	33	975	Table 12 - Data for the US is better than nothing, but comparable data are available for Canada and Greenland, so an effort should be made to have a table for NA, not just one country in it.	Given the many issues raised with this table, and the need to cut text, I deleted it.
Virginia Meléndez Ramírez	33	974	33	974	Table 4.12 has very old data, it could only be mentioned in text.	Given the many issues raised with this table, and the need to cut text, I deleted it.
Cristobal Diaz	33	974	33	Table 4.12 977	The references utilized the majority has more than 20 years, that isn't good	Given the many issues raised with this table, and the need to cut text, I deleted it.
Bob Watson		974		977	Table 4.12.-This seems out of place - delete	Changed as suggested
Bob Watson		978		981	Why is this text bolded – the followed text is not related to the bold text – the bolded text seems random- "Agricultural practices associated with this land conversion significantly change biogeochemical cycles (see section 4.4.2). For example, in the Americas, approximately 23 million tonnes of nitrogen fertilizer and 22 million tonnes of phosphorus (phosphate + potash) were consumed in 2013; and about 52 million hectares of land were under irrigation. "	Whoever wrote this section should consider how best to respond to this comment

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		985	986	1190	"From 1990 to 2015, forest area expanded in North America and the Caribbean but declined in Central America and South America (Keenan et al., 2015). "- quantify	Changed as suggested
Liliana Bravo-Monroy	34	987	34	990	What about the percentage of protected forest areas in every country? It would be very useful giving this information by using a table. Furthermore, what percentage of land is used on traditional multiple cropping systems?	If you prefer, we could add such a table from the information presented in Table 2 of Morales-Hidalgo et al. 2015.
Marcelo Cabido	34	987	34	989	OK, but how much of that protected surface is really under a strict regime in S. America?	It is impossible to know this, as it depends on one's definition of 'strict' regime.
Co-chairs	34	987	34	990	What is meant by "protected". Being inside a non-extractive use park is one form of protection (if the park regulations have high compliance), but many forms of managed harvest "protect" the integrity of the harvested area. As written the text presents a binary situation - protected or not protected, when reality is much different. Make the text inclusive of this diversity of protection tools. This is done in the very next paragraph for urbanization (991-995) and is equally necessary here.	Changed as suggested
Cristobal Diaz	34	987	34	990	<u>Less than 9% of forest area is protected in North America (Morales-Hidalgo et al., 2015). Brazil has a much higher proportion of its forest protected (41.8%, 206 million ha) than any other country. The USA has protected the second greatest forest area (33 million ha, 10.6% of forests; Morales-Hidalgo et al., 2015). To pay attention in two lines underlined, maybe that it is a contradiction</u>	There is no contradiction here. This simply means that Canada has protected less than 9% of its forests, whereas the US has protected slightly more than 9% of its forests
United States Government	34	988	34	988	It would be useful to know the definition of "protected area;" consider including. Further, the percent of the U.S. is much higher than 9% when using IUCN classes I-VI; please revise to indicate such.	Changed as suggested
Giselda Durigan	34	991	34	1010	I suggest including here the very negative effect of soil impermeabilization in urban areas and roads, reducing groundwater recharge and increasing floods and erosion in periurban ecosystems.	Given space constraints, I don't think we should add this.
Liliana Bravo-Monroy	34	991	34	1010	It would be useful prioritising/choosing a few representative cities where can be illustrated ideas described. For instance, how is the provision of water in cities of North, Meso, South America and the Caribbean? What is the source? Is from a protected area? How is its conservation state? etc.	The discussion of water funds and sources of water yield and quality seems to me like it would belong in a different chapter of this report

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Nicola Dal Ferro	34	991	34	1010	Here it should be mentioned whether the increase of urbanization means also a decrease in population of rural areas. Could it involve the increase of wild areas and therefore a perspective of increase biodiversity? Maybe this is a point that can be a bit developed.	This is already addressed by the existing discussion of abandonment of agricultural land, which partly results from urbanization trends
Virginia Meléndez Ramírez	34	991	34	991	In general, this chapter does not present information for Mesoamerica	This is reported on lines 1218-1292
United States Government	34	993	34	993	Not clear what the LAC "urbanization rate has declined smoothly" means. The rate of the population urbanizing is declining? Please clarify.	Changed as suggested
Bob Watson		996	997	1200	"Urbanization can directly and indirectly threaten biodiversity and services from surrounding ecosystems"- why is this bolded?	Key statements are bolded
Rafael Calderón-Contreras	34	996	34	997	However, Urbanization can also have beneficial outcomes when it comes to conservation and biodiversity. Green infrastructure in cities has become one of the best examples of the way in which biodiversity policies have been devoted to create urban ecosystems with the potential to sustain urban dwellers.	Personally, I think this point is over-sold and under-delivered in the cities I have visited and resided. I don't believe we should make this point, unless we want to simply state that there is great potential to further improve urban ecosystems.
Co-chairs	34	998	34	1003	It is true that urban areas require "infrastructure such as dams, pipelines, transmission lines, and roads, timber harvesting, and land cover conversion for grazing and cropping." But <i>any</i> distribution of people on the land requires those things, unless they are to remain hunter-gatherers. Rephrase to be more inclusive than just "urbanization" or else state at the outset that urbanization refers to all patterns of human settlement beyond wholly self-sufficient communities.	It is incorrect that any distribution of people requires the same infrastructure. Much more infrastructure is required for high than for low concentrations of people (e.g., to have sufficient local resources and to process waste).
Cristobal Diaz	34	1002	34	1004	However, they also threaten biodiversity (Laurance et al., 2014) by facilitating resource extraction activities like cropping; grazing; timber harvesting and extraction of water, minerals, oil, and gas. I propose add roads have fragmented the biodiversity habitat too.	Changed as suggested

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		1004		1008	This should be in the section on pollution - "For example, over the last six decades, there have been at least 238 notable oil spills along mangrove shorelines worldwide. In total, at least 5.5 million tonnes of oil has been released into mangrove-lined, coastal waters, oiling possibly up to around 1.94 million ha of mangrove habitat, and killing at least 126,000 ha of mangrove vegetation since 1958 (Duke 2016). "	
Pablo Zaldivar		1007			The text says that in cities there are no endemic native species, which is not true. Cities have endemic species	
Marcelo Cabido	34	1008	34	1010	More over, they may comprise unique plants and animals arrangements/assambles, not found outside the urban habitats	Changed as suggested
Liliana Bravo-Monroy	34	1011	34	1014	It would be advisabe to provide reasons/cases/examples in support of mentioned views.	Such examples are provided elsewhere in this chapter
Ederson A Zanetti	34	1015	34	1015	There should be consideration regarding economic development and wood consumption regarding specific species and their cultivation, like eucalyptus, pine, teak and so on	I disagree that this should be added because the economic values of species are extremely variable across locations and decades
Liliana Bravo-Monroy	34	1015	36	1074	Broad generalities: there is a lack of information related to particularities based on cases/examples located across the Americas continent in representative/typical places of sub-regions.	Cases and examples are provided for each region and subregion after this broad overview section
Bob Watson		1015		1023	This should be part of the earlier discussion on agriculture "With economic development, human diets have shifted toward more meat and dairy consumption (Foley et al., 2011, Tilman et al., 2011). Continuing this trend in coming decades would require further pasture expansion, intensification of livestock production, or both. Much recent forest loss in South America is to pasture creation after road construction, migrant settler colonization, and slash-and-burn forest clearing (MEA, 2005). Maintaining or increasing future food, energy and water production without compromising biodiversity and ecosystem services can involve multiple strategies, including land sharing and land sparing (Fisher et al., 2014); closing yield gaps on underperforming lands (Mueller et al., 2012); improving efficiency of agricultural input application, reducing food waste (Foley et al., 2011) and changing diets (Tilman et al., 2011, Tilman and Clark 2014, Vranken et al., 2014). "	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	34	1018	34	28	This material belongs in Chapter 6 on policy options. The goal is not to make all the stories piecemeal, but to allow policy makers to know where to find the policy options. Stick to presenting the drivers, explaining how they work, and their recent trends. That is a full task without taking on policy options. If the authors feel this material is important to keep here. it should be rewritten as an explanation of how the driver works, not what the polciy alternatives are.	CLAs need to sort this out
The Biodiversity Indicators Partnership (BIP)	34	1024	34	1024	Also reference Fig 3.23 from Chapter 3, here.	CLAs need to sort this out
Thomas Brooks	34	1024	34	1024	Also reference Fig 3.23 from Chapter 3, here.	CLAs need to sort this out
Co-chairs	34	1024	35	1031	this paragraph reads as if it should open the section, not be just inserted here with no link to text immediately before or after it. Integrate into the opening of this section.	Changed as suggested
Bob Watson		1024			"Habitat loss and degradation "- We need a table quantifyinbg how much of each type of habitat in each sub-region has been lost and degraded	
Bob Watson		1037		1048	"Cropland fertilization is also likely driving loss of diversity by increasing anthropogenic nitrogen inputs (Bobbink et al., 2010) and polluting freshwater supplies (see section 4.4.2). Croplands also affect migratory species through habitat degradation, and pesticide usealong their migratory routes (e.g. neotropical migratory birds like dicksisels, bobolinks, and swainsons hawks) (Basili and Temple 1999, Hooper et al., 2003, Lopez-Lanus et al., 2007)."- This should be in the pollution section – delete from this section	
Ederson A Zanetti	35	1049	35	1053	there should be further detailing on species cultivation benefits from market participation, highliting alternatives to increase biodiversity cultivation and ecosystem services provision at the same time	I do not understand this comment
Co-chairs	35	1049	35	1051	even if no studies have been done quantifying the full costs and benefits of land conversions, this entire section is rich with examples of the BES costs of land conversions, but this is the only place where and increases in benefits to people are even mentioned (more food, timber, energy etc). To be balanced there have to be some illlustrations of the magnitude of increases in these services from the land and waters, and not solely illustrated (or in both cases better as trends) in the costs.	Changed as suggested

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		1049		1053	This paragraph should be in the section that discusses interactions among drivers- "Habitat conversion leads not only many native species losses, but also to gains in some exotic species (see section 4.4.4). Exotic species are often introduced for particular human uses but lack a coevolutionary history of interaction with native species. For these and other reasons, they are not necessarily functionally equivalent to the native species they displace (Wardle et al., 2011). Habitat conversion contributes to climate change. Each year, land conversion results in emissions of approximately one billion metric tonnes of carbon (1 Pg C year ⁻¹), which is 10% of emissions from all human activities (Friedlingstein et al., 2010). Soil carbon losses also diminish crop yields and degrade water quality. Nitrogen fertilization also contributes to climate change by emitting the greenhouse gas of N ₂ O (Compton et al., 2011, Sutton et al., 2011, Keeler et al., 2016). Mangroves and other coastal "blue carbon" ecosystems have also high ecosystem carbon stocks and are undergoing significant conversion at a great cost in terms of greenhouse gas emissions as well losses of other important ecosystem services (Kauffman et al. 2016) "	
Bob Watson		1049		1053	"Habitat conversion has also resulted in increases in food, mineral, timber, and energy production. Few studies have weighed such benefits against the costs of habitat degradation described above. In some cases, however, the financial costs of habitat conversion for non-provisioning ecosystem services, like carbon storage and sequestration, can outweigh the benefits of conversion for supply of provisioning services (Nelson et al., 2009)."- This issue needs a much more detailed discussion – expand significantly – the issue of focussing on provision services results in a loss of regulating and cultural services	
Nicola Dal Ferro	35	1054	35	1058	This can be linked to previous comment.Line 991	This is reported on lines 1218-1292
Ederson A Zanetti	35	1059	35	1061	There should be mention to well documented research on the benefits to water quantity and quality of wood harvesting for construction and energy	I do not understand this comment
Bob Watson		1060			"it is possible that reforestation ", delete the reverse of de	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
María Evelinda Santiago	35	1062	36	1072	Some examples in Mexico include: - Bosque de niebla. Las Cañadas - Veracruz (http://www.bosquedeniebla.com.mx/) - UCIRI. Oaxaca (http://www.uciri.com/) - Tosepan Titataniske - Puebla (http://www.tosepan.com/) - Cuetzalan - Puebla (http://www.cuetzalanmagico.mx/bienvenido.html) - Proyecto San Isidro - Tlaxcala (http://www.proyectosanisidro.com/) - Agua para siembre. Tehuacán - Puebla (http://www.alternativas.org.mx/hacemos_agua.html)	A couple specific examples are already provided in Boxes 4.3 and 4.4. I don't think we can add all these additional examples
María Evelinda Santiago Jiménez	35	1062	35	1072	An example of recovery of severely impacted areas can be observed at Las Cañadas: http://www.bosquedeniebla.com.mx/ant01.htm . On the website you can read "Ecological restoration was the easiest, to restore ourselves inside and our daily actions to achieve sustainable life and begin a social restoration, still has us very busy everyday" (March 2008)	A couple specific examples are already provided in Boxes 4.3 and 4.4. I don't think we can add all these additional examples
Virginia Meléndez Ramírez	35	1066	35	1066	Complete with information on the type of ecosystem and country.	These specific details are provided in the subsequent sections, which are arranged by region and subregion.
Bob Watson		1066		1068	Surely this varies from ecosystem to ecosystem and how the restoration was implemented - Compared with reference ecosystems, recovering ecosystems exhibit annual deficits of 46–51% for organism abundance, 27–33% for species diversity, 32–42% for carbon cycling and 31–41% for nitrogen cycling ""	
Giselda Durigan	37	1074	37	1079	There are many restoration experiences to present here. The title is really bad. It should be Tropical Forest and grasslands, perhaps. It would be convenient to register here that tropical forests restoration has been successful, but other biomes have been neglected, lacking of technology, seeds, and funds. It could be also mentioned that most degraded areas still have resilience and therefore passive restoration (natural regeneration is still possible, especially for the Amazon Forest and Cerrado.	These boxes don't seem to satisfy reviewers, who want more details for these examples or many more examples. I moved them down from the overview section to the sections organized by region, which will hopefully help address these comments

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	37	1076	37	1078	Box 4.3 cites particular cases (sustainable mamagemnt practices in Brazil and Colombia). It would be useful to provide details of these cases instead of broad generalities.	These boxes don't seem to satisfy reviewers, who want more details for these examples or many more examples. I moved them down from the overview section to the sections organized by region, which will hopefully help address these comments
Virginia Meléndez Ramírez	37	1076	37	1076	Box 4.3 The contents of the box put it in the text and really explain full examples for Latin America. Pass the example from box 4.4 to 4.3 and remove box 4.4.	These boxes don't seem to satisfy reviewers, who want more details for these examples or many more examples. I moved them down from the overview section to the sections organized by region, which will hopefully help address these comments
Cristobal Diaz	37	1076	37	1078	The Box 4.3 is very general and with small explanation, maybe i more useful analyze two or three examples in the table or one very illustrative.	These boxes don't seem to satisfy reviewers, who want more details for these examples or many more examples. I moved them down from the overview section to the sections organized by region, which will hopefully help address these comments

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Marlín Pérez Suárez	37	1076	37	1078	Box 4.3 To mention which regions have benefited from the restauration programs, and in what percentage have they been restored. In the case of Mexico, template forest is one of the most threatened ecosystems and in turn most of the reforestation programs are focused on this type of vegetation	These boxes don't seem to satisfy reviewers, who want more details for these examples or many more examples. I moved them down from the overview section to the sections organized by region, which will hopefully help address these comments
David Loreto	32	1077	37	1078	It is suggested to mention authors who have reported these different levels of resilience in the vegetation. In addition, the quotation from Rodrigues et al., 2011, should be reviewed since it is not found in section 4.9. References	Full reference for Rodrigues et al. 2011 is needed
DPG/Sbio/MMA	34 (Box 4.3)	1077	34 (Box 4.3)	1078	"... there are already examples in Brazil where restoration in large-scale with high biodiversity (tropical forests) have been achieved (Rodrigues et al., 2011)..." This information should have same exemples of restoration in Brazil to corroborate and exemplify this information. It would be interest to have a detailed example in the report and maybe with highlighted reasons or aspects of the methodology used that were responsible for the success of the initiatives in Brazilian territory. The exmple that follows in the text is from Colombia.	
David Loreto	32	1077	37	1078	It is suggested to mention authors who have reported these different levels of resilience in the vegetation. In addition, the quotation from Rodrigues et al., 2011, should be reviewed since it is not found in section 4.9. References	Full reference for Rodrigues et al. 2011 is needed
Numa P. Pavón Hernández	37	1077	37	1077	FAO, 2013???? Not included in the references.	Fulll reference for FAO data is needed

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	38	1080	38	1081	Box 4.4 It would be useful to provide more details about a previous state and then successful restoration.	These boxes don't seem to satisfy reviewers, who want more details for these examples or many more examples. I moved them down from the overview section to the sections organized by region, which will hopefully help address these comments
Co-chairs	38	1080			Box 4.4 - several details wrong here: the increase in waste and chemical pollution reached high levels at least by the manufacturing boom associated with WWII (1940s) and in the lower Great Lakes even earlier. Also the introduction of Pacific salmon was not an ecological choice to "replace the lake trout". It was driven by pressure from the US sport fishing industry that wanted a large salmon, and it made restoring the native lake trout impossible. But overall messages reasonable.	These boxes don't seem to satisfy reviewers, who want more details for these examples or many more examples. I moved them down from the overview section to the sections organized by region, which will hopefully help address these comments
United States Government	38	1080	38	1080	Is the first sentence, "...represent 18% of the world's available supply" referring to supply of freshwater? Please revise.	Changed as suggested
United States Government	38	1080	38	1080	In "Direct and indirect drivers of change in biodiversity and nature's contributions to people", Box 4.4, the Great Lakes Restoration Initiative was not mentioned, which is a significant example of successful restoration initiatives. Consider including.	Due to space constraints, I have not added in this additional content.
Numa P. Pavón Hernández	38	1080	38	1080	In Mexico PRONATURA (a Mexican environmental conservation group) has realized restoration projects. The range of prices varies between \$ 24,000 to 84,000 US for ha for cloud forest and mangroves.	It's impossible to include all restoration case studies

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	38	1082	49	1516	First of all, the use of maps would strengthen the information given. Maps depicting habitats in two time periods would be suitable in order to distinguish changes. Second, it would be helpful to organise/focus information according to main topics; for instance: (1) importance of an habitat, (2) status and trends, (3) risks and opportunities, and optionally (4) policy and management options. Some of those issues are provided, other not. For a decision maker, a panoramic view would be valuable underpinned by multiple specific cases.	CLAs need to sort this out
Co-chairs	38	1082	41	1282	This is a fair summary of the nature of the land conversions in NA from many of the biomes there. However, it presnets <i>only</i> the negative consequences of the land conversions. The IPBES regional assessments do not have to document all the types of economic and social developments that have occurred in the last century. However they at least have to acknowledge them, and that the land conversons were not undertaken just to destroy biodiversity and reduce NCP. In fact many were done to increase the provision of some specific contribution. Many the overall costs did not exceed the benefits, but that point was already made on page 35. Here, to be balanced, there have to be at least a sentence or two for each biome on how great the increase has been in food, timber, energy or whatever other NCP was the driver of the land conversion. Otherwise we are only informng decision-makers of one side of the choices they need to make, and are no better than industries that only tell the decision-makers the parts of the choices that serve there interests.	Given constraints on word limits, I see no way to add in a sentence or two for every biome in every region. This would also be very repetitive. For these reasons, we made this point in the overview section.
Numa P. Pavón Hernández	38	1082	38	1082	I suggest that previously you include a new section, somethink like Regions conditions.	I do not understand this comment
Numa P. Pavón Hernández	38	1085	41	1220	Change Chiihuahuan by Chihuahuan	Changed as suggested

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Rodrigo Medellín	38	1088	38	1089	Yes they did. They became extinct, but they evolved with large mammal herds.	It is well-documented that the basin and range region of the US, west of the Rocky Mountains, did not have native hooved mammals because it had biocrusts that were broken for the first time when livestock grazing was introduced. I do not claim to know this for all dryland regions, but I believe this statement is accurate as written.
Marcelo Cabido	38	1090	38	1097	I wonder whether this is a miss interpretation of my own, but as far as I have understood, in arid regions water is likely to reach deeper levels in the soil profile (where the roots of shrubs explore) only after heavy rainfall events. Light rains are not likely to penetrate or reach deep horizons but only a few centimeters below the soil surface, then favouring grasses whose roots are mainly distributed in the first 20 to 30 cm.	Changed as suggested
Brenda McAfee	39	1109	39	1109	This reference is missing or else it should be Hoesktra et al., 2005 as listed.	Full reference for Hoekstra et al. 2010 is needed
United States Government	39	1117	39	1117	"conspicuously" can often be accompanied by a negative connotation; consider "notable" instead.	Changed as suggested
Rodrigo Medellín	38	1119	38	1119	Here is the large herds referred to in line 1089	These herds of bison were found in prairie grasslands (and thus are included in the discussion of this biome). They were not historically present on the west side of the Rocky Mountains, in the drylands (and thus were not discussed in the discussion of that biome).

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Rodrigo Medellín	40	1140	63	1971	Pages 40 to here (and likely more) read like a series of examples and case studies with few generalizations or global statements	Yes, this chapter was designed to start with an overview and then continue with many examples and case studies by region and biome
Marcelo Cabido	40	1153	40	1167	However, forest cover in North America is higher at present than it was at the beginning of XXth century	I do not understand this comment
United States Government	40	1153		1167	There needs to be a clarification about the difference between forest area and forest cover - the US forest area, based on land use, has continued to increase, while forest cover fluctuates as forests experience harvest and other disturbances(considered a cover loss but is temporary as long as the land remains in forest use and regrows). This distinction is important in understanding the dynamics of land use change and the character of remaining forest. However, the sources quoted in these paragraphs are all based on forest cover, not forest use.	Changed as suggested
Marcelo Cabido	40	1174	40	1183	I found the paragraph rather confusing.	Changed as suggested
United States Government	40	1178	40	1178	Insert "to" - distribution to younger stands...	Changed as suggested
United States Government	40	1183	40	1183	This sentence is confusing; please revise.	Changed as suggested
Brenda McAfee	41	1190	41	1190	This is the North America section, delete Central America	Changed as suggested
Cristobal Diaz	41	1190	41	1190	In the text: "The wetlands of North and Central America include many different wetland types" - The Central America is out of context because is analized only North America	Changed as suggested
United States Government	41	1190	41	1190	This sentence mentions Central American wetland, though this is a section dedicated to North America. Is this reference to Central America intended to be here? If not, please relocate to the Central America section.	Changed as suggested
Royal Gardner	41	1195	41	1195	Need to note that wetland losses occurred in the conterminous US -- Alaska and Hawaii are not included. If they were, the 53% figure would be significantly lower due to the undeveloped nature and massive area of Alaska.	Changed as suggested
Brenda McAfee	41	1199	41	1199	This sentence needs work. Perhaps wetland loss is missing after ... almost always increases <i>wetland loss</i> ?	Changed as suggested

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Margarita N. Lavidés	41	1200	41	1200	Delete: "in are" as in "....may fluctuate as part of cyclic land-use...."	Changed as suggested
Royal Gardner	41	1201	41	1203	Need also to note the restoration gains attributable to the Wetlands Reserve Program. See eg Wiebusch & Lant (2017), Policy Drivers of US Wetland Conversion Rates, 1955-2009 http://www.tandfonline.com/doi/abs/10.1080/08941920.2016.1196279	Changed as suggested
United States Government	41	1208	41	1210	Alig et al 2004 may be a dated reference; consider using a more recent land use projection.	Unfortunately, I don't know a better reference here
Marcelo Cabido	41	1213	41	1217	Then, what should be recommended? To increase population in less area (higher density) or not?	Our charge is not to make recommendations, but simply to present the information needed for improving decision-making
Virginia Meléndez Ramírez	41	1218	41	1218	For Mesoamerica documenting more about drylands and xerophytic scrub. There is a lack of rainforest, temperate forest and others such as the dune and marine area, for example in Mexico, see map: http://apps1.semarnat.gob.mx/dgeia/informe_resumen14/02_ecosistemas/2_1.html In this page there are other interesting maps for Mexico.	Thanks for the references. Due to space limitations we could not cover all ecosystems at finer scales.
Manuel Maass	41	1218	43	1292	The disintegration of the "ejido", as a result of the changes in Article 27 of the Mexican Constitution, has resulted in the fragmentation of the territory and in loss of governance.	Noted.
Luis Ubaldo Castruita Esparza	41	1220	41	1220	Must be written Chihuahuan deserts, not Chiihuahuan, it is written with only one (i)	Changed as suggested
Luis Ubaldo Castruita Esparza	42	1245	42	1245	A space is required between the word "cover" and 519,597 km ²	Changed as suggested

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Numa P. Pavón Hernández	42	1250	42	1250	<p>“Based on our digitizing of Rzedowski's (1990) potential vegetation map, we estimate that ca 270 000 km² (around 14% of the country) must have been covered originally by seasonally dry tropical forest in Mexico Seasonally dry tropical forests in the neotropics reach their northernmost distribution in Mexico. At the local level, close to 60% of the original vegetation has been lost, and only 19% remains in a forested condition. These remnant forests are restricted to areas with steep slopes. An annual deforestation rate of 1.4% was calculated and remaining areas are heavily fragmented and somewhat disturbed. If the trends detected continue, these remaining forests will be heavily reduced and degraded in the near future.”</p> <p>Trejo, I., & Dirzo, R. (2000). Deforestation of seasonally dry tropical forest: a national and local analysis in Mexico. <i>Biological conservation</i>, 94(2), 133-142.</p>	Thanks for th references. Due to space limitations we could not cover all ecosystems at finer scales.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	41	1283	49	1513	My comment overall here is very much the same as for the previous comment. This is a very one-sided presentation of land conversion for all the Subregions. To repeat, there is no expectation that all the statistics on increases in crop yields, energy production, timber, housing, reductions in travel time etc be tabled here. But there have to be at least some such statistics, even if aggregated at relatively high levels. The readership - both civil society and decision-makers, have to find in the IPBES assessments both the benefits as well as the costs of these conversions. Where details on the trends in benefits are needed, they are the business of Chapter 2, where they are generally presented pretty well. Exactly the same reasoning should be applied to the BES costs. The details are the business of Chapter 3, and are generally done well there. Chapter 4 is about how much <i>conversion</i> has occurred, and this quantitative information is very unevenly covered in the subsections of 4.4.1. Both MesoAmerica and Caribbean are almost completely anecdotal, and more quantitative information of amounts of land conversion by biome is necessary. In addition, the narrative style of presentation makes this whole section take far more space than is needed. Going through the subsections, for the most part the general ecological <u>consequences</u> of converting one type of biome to another (generally one of the altered ones) are the same. These consequences could be told once. Then how much conversion of each type to others by subregion could be told as quantitatively as possible, and a link of which indirect drivers are causing the conversions, possibly using little more than well constructed tables. This would give the information on how the DRIVERS are being expressed. The whole thing would be much shorter than this section, and reduce repetition among chapters.	Given constraints on word limits, I see no way to add in a sentence or two for every biome in every region. This would also be very repetitive. For these reasons, we made this point in the overview section.
Numa P. Pavón Hernández	43	1290	43	1290	Maybe you can include that now the mangroves are included in the Mexican list of threat species (NOM 059).	Thanks for the references. Due to space limitations we could not cover all ecosystems at finer scales.
Thomas Brooks	43	1294	43	1295	I'm sure that this is correct for the Lesser Antilles, Bahamas, etc, but am not convinced that it is the case for the Greater Antilles, especially Hispaniola, where agricultural expansion into marginal uplands is a major threat to biodiversity. Would be wise to add a caveat regarding geographic variation here.	Noted.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	43	1295	43	1297	This sentence is not necessary to make the point, and could be perceived as biased; please revise or delete.	Text was revised.
Margarita N. Lavidés	43	1309	43	1314	While the anthropogenic pressures are being specified in the terrestrial e.g. forests etc., impacts from what pressures in the marine environment are not specified, Caribbean marine ecosystems are among the most severely impacted globally (Halpern et al 2007), mainly due to impacts of coastal systems: mangroves, coral reefs, seagrass beds and beaches..." But impact from what pressures? dive tourism? overfishing? siltation? Thus this part of the section is vague. It would be good if these be clarified. For example, there are a number of well known literature in the marine sciences regarding trophic cascades in coral reefs due to overfishing in the Caribbean. This should be included as aggravating the impacts of climate change and thus further diminishing the ability of coastal communities to adapt to impacts of climate change.	It's unclear to me how much we should discuss marine systems.
Marco Keijzer	44	1315	44	1339	In Bonaire the dry forests experience excessive stress because of a long history of grazing, felling and cultivation. Less than 30% of the original ecosystems occupy the island. Large grazers as goats, sheep, donkeys, cattle and horses which were introduced in the 17 th century were left to roam, and currently approximately 30,000 goats roam free on the island heavily affecting the vegetation. Source: http://www.wolfscompany.com/wp-content/uploads/2014/07/Total-Economic-Value-of-Nature-of-Bonaire.pdf	Thanks for the references.
Marco Keijzer (Wolfs Company)	44	1315	44	1339	In Bonaire the dry forests experience excessive stress because of a long history of grazing, felling and cultivation. Less than 30% of the original ecosystems occupy the island. Large grazers as goats, sheep, donkeys, cattle and horses which were introduced in the 17 th century were left to roam, and currently approximately 30,000 goats roam free on the island heavily affecting the vegetation. Source: http://www.wolfscompany.com/wp-content/uploads/2014/07/Total-Economic-Value-of-Nature-of-Bonaire.pdf	Thanks for the references.
Marcelo Cabido	44	1341	44	1341	Isn't it Sechura instead of Secura?	Name was corrected
Marcelo Cabido	44	1342	44	1343	Can't imagine how appropriation is likely to occur in the Atacama desert with an annual average precipitation of 0.6 mm yr ⁻¹	Noted.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Margarita N. Lavidés	44	1342	44	1342	Correct: 'hightly' to highly	Changed as suggested
Marcelo Cabido	45	1350	45	1359	These figures are perhaps overestimating the role of protected areas in South America	Actually, I am quite confident that these are the best available numbers here. Note that another reviewer suggested that the numbers for protected areas in the US were too low (rather than too high) because he/she assumed that other classes of land should be included. Thus, I think the numbers presented are fair and balanced between the overly-optimistic numbers that some people would like to see and the overly-pessimistic numbers that others would like to see.
Philip M. Fearnside	45	1352	45	1352	For data on deforestation in protected areas in Brazil, see: Nogueira E.M., A.M. Yanai, S.S. Vasconcelos. P.M.L.A. Graça & P.M. Fearnside. 2017. Carbon stocks and losses to deforestation in protected areas in Brazilian Amazonia. Regional Environmental Change doi: 10.1007/s10113-017-1198-1 [open access]	Actually, I am quite confident that these are the best available numbers here. Note that another reviewer suggested that the numbers for protected areas in the US were too low (rather than too high) because he/she assumed that other classes of land should be included. Thus, I think the numbers presented are fair and balanced between the overly-optimistic numbers that some people would like to see and the overly-pessimistic numbers that others would like to see.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Numa P. Pavón Hernández	45	1353	45	1353	This value does not coincide with others previously cited	Actually, I am quite confident that these are the best available numbers here. Note that another reviewer suggested that the numbers for protected areas in the US were too low (rather than too high) because he/she assumed that other classes of land should be included. Thus, I think the numbers presented are fair and balanced between the overly-optimistic numbers that some people would like to see and the overly-pessimistic numbers that others would like to see.
Philip M. Fearnside	45	1357	45	1357	Need to mention that deforestation in Brazilian Amazonia has been increasing since 2012. See: Fearnside, P.M. 2017a. Deforestation of the Brazilian Amazon. In: H. Shugart (ed.) Oxford Research Encyclopedia of Environmental Science. Oxford University Press, New York, USA. (In press)	This reference is in press, which makes it difficult or impossible to cite. Mercedes seems best-positioned to respond here.
Brenda McAfee	45	1358	45	1358	Should be specific as to what is included in forest area e.g. are plantations included?	Changed as suggested
Margarita N. Lavides	45	1358	45	1358	Correct: 'areaa' to areas	Changed as suggested
Virginia Meléndez Ramírez	45	1360	45	1360	This is information for Latin America and Mexico is included in the section of South America.	I think this is fine as stated and organized. I don't see any information for Mexico here.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Philip M. Fearnside	45	1371	45	1375	<p>The deforestation causes mentioned here are important, but there are several others that also need to be recognized. See: Fearnside, P.M. 2005. Deforestation in Brazilian Amazonia: History, rates and consequences. <i>Conservation Biology</i> 19(3): 680-688. doi: 10.1111/j.1523-1739.2005.00697.x</p> <p>Fearnside, P.M. 2008. Amazon forest maintenance as a source of environmental services. <i>Anais da Academia Brasileira de Ciências</i> 80(1): 101-114. http://dx.doi.org/10.1590/S0001-37652008000100006</p> <p>Fearnside, P.M. 2017a. Deforestation of the Brazilian Amazon. In: H. Shugart (ed.) <i>Oxford Research Encyclopedia of Environmental Science</i>. Oxford University Press, New York, USA. (In press)</p> <p>Fearnside, P.M. 2017b. Deforestation in Brazilian Amazonia. In: E. Wohl (ed.) <i>Oxford Bibliographies in Environmental Science</i>. Oxford University Press, New York, USA. doi: 10.1093/obo/9780199363445-0064.</p>	Thanks for the references.
Philip M. Fearnside	46	1392	46	1392	<p>For impact of dams on biodiversity see: Lees, A.C.; C.A. Peres, P.M. Fearnside, M. Schneider & J.A.S. Zuanon. 2016. Hydropower and the future of Amazonian biodiversity. <i>Biodiversity and Conservation</i> 25(3): 451-466. doi 10.1007/s10531-016-1072-3.</p> <p>Ritter, Camila D.; Gabriel McCrate, R. Henrik Nilsson, Philip M. Fearnside, Ulrika Palme, Alexandre Antonelli. 2017. Environmental Impact Assessments in Brazilian Amazonia: Challenges and prospects to assess biodiversity. <i>Biological Conservation</i> 206: 161–168. doi: 10.1016/j.biocon.2016.12.031 Open access</p>	Thanks for the references.
Virginia Meléndez Ramírez	45	1411	45	1411	Mexico is included in the section of South America.	It is fine and appropriate to give Mexico credit in this regard when discussing these South American countries.
Marcelo Cabido	46	1412	46	1413	I suggest to add the word "tropical" when referring to the forests in this paragraph, since things may be different when talking about sub-tropical ecosystems	Noted.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Diana Patricia Alvarado-Solano	46	1415	46	1416	The exotic animals that are now the base for livestock production in Meso and South America were introduced by Spaniards during the colonization. It's important to mention this in a way to make notice about the time frame in which the different ecosystems have been under land use conversion. Also, it's important to present the statistics for the LAC the cover extent and percentage of TDF under protection (Sánchez-Azofeifa et al. 2005. Research priorities for neotropical dry forests. <i>Biotropica</i> . DOI: 10.1111/j.1744-7429.2005.00066.x; Sánchez-Cuervo et al. 2012. Land Cover Change in Colombia: Surprising Forest Recovery Trends between 2001 and 2010. <i>PlosOne</i> . doi:10.1371/journal.pone.0043943; Romero-Duque et al. 2007. Structure and diversity of secondary tropical dry forests in Mexico, differing in their prior land-use history. <i>Forest Ecology and Management</i> . DOI: doi:10.1016/j.foreco.2007.07.002; Quesada et al. 2009. Succession and management of tropical dry forests in the Americas: Review and new perspectives. <i>Forest Ecology and Management</i> . doi:10.1016/j.foreco.2009.06.023; Alvarado-Solano & Otero. 2017. Natural areas of tropical dry forest in Valle del Cauca, Colombia: an opportunity for restoration. DOI: 10.21068/c2017.v18s01a01; Pizano & García. 2014. El Bosque Seco Tropical en Colombia. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH). Available at: http://www.humboldt.org.co/es/component/k2/item/529-el-bosque-seco-tropical-en-colombia	Thanks for the references.
Thomas Brooks	46	1427	46	1427	Mention policy options for the cerrado here; see eg Strassburg et al. (2017) Moment of truth for the Cerrado hotspot. <i>Nature Ecology & Evolution</i> . DOI: 10.1038/s41559-017-0099.	Policies are covered by Chapter 6.
Marcelo Cabido	46	1428	47	1432	There is more recent literature on this topic. See for example Fehlenberg et al. 2010. <i>Global Environmental Change</i> 45: 24-34	Thanks for the references.
Marcelo Cabido	47	1462	49	1513	The space devoted to Marine and Freshwater habitats is quite unbalanced with respect to terrestrial ecosystems. For example, I couldn't find a single reference to the effects of land degradation on upwelling zones both in North and South America.	Noted. Unfortunately the expertise of the authors was also unbalanced.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	48	1462	50	1513	For SA there are more than 50 lines of information on conversions of coastal habitats and spaces. For the other regions of Americas, there is almost nothing, except a few lines in MA and Caribbean on mangrove loss, and a sentence on tourism resorts in Caribbean. These regional assessments must cover the coastal areas as well, and information must be added for "land degradation on MA and NA coastal areas as well.	We will need to solicit help from more authors if we need to add this content for other regions.
Bob Watson		1474			"Global sulfur dioxide emissions were greatest in the 1970s and then decreased, but since the year 2000 "- Forget about global emissions – quantify emissions over time from each of the sub-regions in the Americas	
Giselda Durigan	48	1476	48	1477	The box about Fire management needs improvement. Fire management for biodiversity conservation is not allowed in Brazil, except in Protected Areas if predicted in the Management Plan. The need of fire has been highlighted (Pivello 2011; Durigan & Ratter 2016), Recently, some research projects aiming at fire management in the Cerrado biome are ongoing and results are expected to give support to management aiming at biodiversity conservation in Brazil. Sources (1) Durigan, G., & Ratter, J. A. (2016). The need for a consistent fire policy for Cerrado conservation. <i>Journal of Applied Ecology</i> , 53(1), 11-15.; (2) Pivello, V.R. (2011) The use of fire in the Cerrado and Amazonian Rainforests of Brazil: past and present. <i>Fire Ecology</i> , 7, 24–39.	The text box is just a case study to highlight the relevance of ILK for management of natural ecosystems. It was not intended to cover different approaches of fire management.
Virginia Meléndez Ramírez	48	1476	48	1476	Box 4.5 Add meaning of this acronym: TFK	Noted.
Marcelo Cabido	49	1495	49	1498	Please, differentiate between west (Chile, Perú, etc.) and east coasts (Argentina, Brazil, etc.)	Changes as suggested.
Virginia Meléndez Ramírez	49	1515	49	1515	Tabla 4.13 mention the country	Whomever wrote this section should consider how best to respond to this comment
Diego Pacheco	49	1517	65	2012	There is the need to summarize this part of the section and to highlight better the main findings regarding pollution by biomes. There is the need to highlight better the drivers affecting pollution. I suggest more use of infographics in order to improve comparison among subregions in America.	The overview is included at the beginning of this section

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	50	1518	65	2010	As stated above, it would be helpful to organise/focus information according to main topics; for instance: (1) importance/dimension/source of a pollutant; (2) status and trends, (3) risks and opportunities, and optionally (4) policy and management options.	The examples were truncated in the comments; however, the organization was preset and we could not change it.
Liliana Bravo-Monroy	50	1518	65	2010	Similarly, a challenge could be unifying both parts of the section (lines 1518-1691; lines 1692-2010) by analysing/connecting/comparing the effect/impact of mentioned factors (e.g., ocean acidification, plastic pollution, over fertilisation, toxicants) on specific locations of each subregion, making reference of spatial and temporal scales being examined. Despite the fact that cases are cited and localised, more cases and details would strengthen the section.	We cannot do this here for reasons of space.
Liliana Bravo-Monroy	50	1518	65	2010	In order to gain clarity, it would be useful to include a table/matrix where key effects/sources/locations be illustrated and integrated. For instance it might appear as the following (see adjacent cells I46 to M46, I46 to I54).	We have added synthetic tables of drivers, their trends, and their level of effects for each subregion. We cannot do this here for reasons of space
Bob Watson		1519			in section 4.4.2. Pollution and related changes in biogeochemical cycles : better "Nature of the driver, its recent status, and trends and what influences its intensity In its pursuit of food, water and energy,"	
Virginia Meléndez Ramírez	50	1520	50	1520	Add meaning of this acronym: NCP	This is now spelled out in section 4.3.
Bob Watson		1520			in section 4.4.2. Pollution and related changes in biogeochemical cycles - Focus on the Americas not global	
Co-chairs	50	1527	Table 4.14B		Not disputing the values presented in the table. However, aside from the metric tons of plastic, I doubt of many of the readership will have any framework to interpret the numbers - other than there is a lot more organic chemical and fertilizer production than heavy metals and oil spills. Some scale information is needed to makethe table interpretable to non-specialists.	These units apply to all of Part B of the chapter. We moved the units to the top of that section.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	50	1529	51	1545	These effects of ocean acidificaiotn and deoxygenation are concerning but there is almost nothing quantitative or even semiquantitation. Something more specific is needed here. Give an idea of scalue at least.	This describes the nature of driver, as required in the guidelines. Recent status and trends in drivers are described in subregion sections. Quantitative data are presented where space permitted and if available but were not emphasized in the guidelines. Quantitative data are presented where space permitted and if available, and we have edited the document to include more where possible given space limitations and the requirement to shorten the document.
Cristobal Diaz	50	1529	55	1673	All these questions written would be related to The Americas not at the World really are well described but our main task is that is occurring in The Americas. For me it is unnecessary	This comment was truncated. However, the first requirement for the drivers chapter is to describe the nature of drivers. We have shortened this text somewhat.
Bob Watson		1529			Put plastics pollution in a separate section – do not mix the issues	
Bob Watson		1531			"As atmospheric CO2 increases, mainly from fossil fuel combustion, pH and calcium carbonate (CaCO3) saturation in ocean water decrease (Fabry et al., 2008). "- Quantify both the increase in atmospheric carbon dioxide and the change to date in ph	
Bob Watson		1536			"Ocean oxygen content declined 2% since 1960 and with climate change could decline 1-7% by 2100. " - Is the 2% valid for surface waters and deep water as well – please be specific	
United States Government	51	1542	51	1542	"Reports of hypoxic coastal waters grow exponentially" sounds as if the reports are growing exponentially, not the hypoxia; consider revising. The sentence could read: "Hypoxia is reported to be growing exponentially."	This has been revised.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		1546		1548	I do not understand the bold sentetnce – please edit- "Plastic characteristics, like lower natural resource use and costs, and resistance to degradatation, drive consumer plastics use."	
Bob Watson		1546		1558	Separate section- "Plastic pollution enters the ocean via rivers, sewage, fishing and other sources. Plastic characteristics, like lower natural resource use and costs, and resistance to degradatation, drive consumer plastics use. Meanwhile, although waves and sunlight break plastics to smaller pieces, including to microplastics (<5 mm), plastics take hundreds of years to degrade in colder, darker waters once they sink below the ocean surface. Buoyant debris comprises only 1-10% of the millions of metric tons of plastic pollution in oceans. It converges in northern and southern subtropical zones of the oceans in "gyres." Plastics kill or negatively impact biodiversity components, from zooplankton, to fish and shellfish, sea turtles, seabirds and marine mammals, because animals frequently consume plastics of various sizes or are suffocated or maimed by them. Microplastics adsorb legacy Persistent Organic Pollutants (POPs) and are passed from lower to higher trophic levels, exposing humans and animals that consume zooplankton, fish and shellfish to these carcinogens and teratogens (toxic to embryos). By fouling boats and fishing nets and equipment, plastic pollution imposes costs to the fishing industry and society for related cleaning and rescue (Clark et al., 2016, UNEP/Kershaw et al. 2011) "	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	51	1553	51	1558	Same comment as the one above - all descriptive. At least some semi-quantitative informaotn on scale of impacts is necessary.	This description is here because the guidelines first require a description of the nature of driver. Second and third requirements were descriptions of drivers' recent status and trends, which are described in subregion sections. Quantitative data are presented where space permitted and if available, and we have edited the document to include more where possible given space limitations and the requirement to shorten the document.
Bob Watson		1561		1562	"N). Nitrogen release can change ecosystem structure and function, affecting plant or microbial community composition, production, soil properties and susceptibility to fire or disease (Porter et al., 2012). " - Please rephrase – Nitrogen releases have changed – then describe the impact on ecosystems and NCP	
Bob Watson		1573			NO should read Noy - "including NO and NH3"	
Co-chairs	51	1574	51	1575	Use the much more recent data from IPCC AR 5, rather data in a 2001 reference. . Hard data are available in IPCC AR5 WH III that are more up to date and more rigourous.	We are unable to make these changes for reasons of time.
Bob Watson		1586			"and site-specific impacts that can contribute to species composition changes and reduced plant diversity "- Change to have contributed and provide an example or two	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Numa P. Pavón Hernández	52	1589	52	1589	Figure 1 in Thuiller (2007) shows the main factors, or 'drivers', affecting biodiversity. "This summary of the relative effects by the year 2100 is a composite derived from calculations carried out for 12 individual terrestrial and freshwater ecosystems by O. E. Sala et al. (Science 287, 1770–1774; 2000)". In these figure, nitrogen deposition is the third major driver for the loss of biodiversity. Thuiller, W. (2007). Biodiversity: climate change and the ecologist. Nature, 448(7153), 550-552.	Thank you for this comment. Figure 4 summarizes the main anthropogenic drivers of changes in biodiversity.
Co-chairs	52	1590	54	1627	Nitrogen in the atmosphere did not have numbers to scale and back up text, we have now had three more paragraphs on three different pollutants that are completely narrative and therefore their representativity is questionable.	This describes the nature of driver, as required in the guidelines. Recent status and trends in drivers are described in subregion sections. Quantitative data are presented where space permitted and if available but were not emphasized in the guidelines. Quantitative data are presented where space permitted and if available, and we have edited the document to include more where possible given space limitations and the requirement to shorten the document.
Bob Watson		1591		1592	"This can increase nutrient concentrations and promote algal" - has increased	
Bob Watson		1593			"from human waste and manufacturing and urban runoff, can transport nutrients and sediment to rivers and streams. "- Has transported	
Bob Watson		1601			"particularly as per capita GDP, food crop " - It will primarily be related to the combination of the increase in GDP and population not just per capita GDP	
Bob Watson		1602		1603	"eutrophication increases disease risk for humans "- Be specific – what diseases	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	53	1611	53	1611	Figure title - introducing scenario names without explanation could confuse readers who aren't familiar with them; consider revising or including a short description of each scenario.	Thank you for this comment. We revised the caption to define the scenarios and the legend symbols.
Numa P. Pavón Hernández	53	1611	53	1613	What does mean SAS, NAM, NAS?	Thank you for this comment. We revised the caption to define the scenarios and the legend symbols.
Bob Watson		1615		1616	"Rivers and streams naturally carry some uncontaminated sediment uncontaminatedas an important part of the ecosystem"- Something wrong with this sentence	This sentence is fixed
Co-chairs	54	1628	54	1658	Again everything is descriptive. The types of claims made on lines 1647-1649 are serious and there should be some quantitative information of some sort presented - not just a sentence that could be dismissed as intentionally trying to scare the reader, without really presenting any evidence.	This describes the nature of driver, as required in the guidelines. Recent status and trends in drivers are described in subregion sections. Quantitative data are presented where space permitted and if available but were not emphasized in the guidelines. Quantitative data are presented where space permitted and if available, and we have edited the document to include more where possible given space limitations and the requirement to shorten the document
Bob Watson		1629			Focus on the Americas - "Ecosystems throughout the world have experienced low-level exposure to many differentmany different substances due to human activities"	
Bob Watson		1633			"Toxicants released to the air are disseminated the longest distances, and might be expected to affect the most species.".- What is the bevidence for this statement – this is an assessment not a guessing game	
Bob Watson		1634			Delete biota, better "Because biota experience toxicant sin combination"	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Pomerleau, C.	54	1637	54	1639	This sentence is very hard to understand. Please rewrite.	We revised this sentence.
Bob Watson		1647			"Agroecology is an alternative to conventional agriculture that builds on local knowledge and innovation. In much of Latin America agricultural fields are still managed by small farmers, ..." - No explicit mention of IPM and INRM – why?	They are not part of Agroecology
Numa P. Pavón Hernández	54	1651	54	1652	Data would be prior to 2008. Are you using the word now as 2017?	We revised this sentence to read: Ozone background concentrations have nearly tripled in Europe from 10-15 ppb in the 1800's to 35-40 ppb in 2008 (Royal Society 2008).
Bob Watson		1653			"or biomass burning interact with vapors from solvents" - Be specific – primarily non-methane hydrocarbons	
Bob Watson		1657		1658	"are in eastern North America, Central Europe, northern South America Asia (Royal Society 2008). "- Focus on the Americas. Delete centra europe, central africa and south- east	
Co-chairs	54	1658	55	1974	Again, these assessments need data on status and trends in the drivers, not just statements about their possible impacts.	This describes the nature of driver, as required in the guidelines. Recent status and trends in drivers are described in subregion sections. Quantitative data are presented where space permitted and if available but were not emphasized in the guidelines. Quantitative data are presented where space permitted and if available, and we have edited the document to include more where possible given space limitations and the requirement to shorten the document.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		1665		1666	Quantify the increase in pesticide use in the sub-regions of the Americas: The amounts, types, and use of pesticides for agriculture change over time, but their worldwide use increases	
Virginia Meléndez Ramírez	55	1666	55	1666	Include growth of transgenic crops in America.	We cannot do this here for reasons of space.
United States Government	55	1666	55	1673	The use of Bt crops has increased insect diversity on farms because Bt proteins are targeted to particular types of pests that feed directly on crops, and targeted control of insects decreases the use of broad spectrum pesticides. Further, this paragraph should acknowledge that herbicides allow farmers to reduce tilling, which maintains soil biodiversity and reduces erosion and soil particulates from polluting waterways; please revise the text to reflect this.	This section related to GMOs has been deleted.
Numa P. Pavón Hernández	55	1668	55	1671	The objective was to decrease the use of insecticides as this extended the use everywhere.	This section related to GMOs has been deleted.
Bob Watson		1669			"led to insecticide use worldwide"- focus on the Americas and quantify	The section that talks about GMOs has been deleted.
Co-chairs	55	1674	55	1693	The increasing avoidance of agricultural chemicals is not unique to Latin America. Present an estimate of how widespread organic farm is in NA	We added this: Organic agriculture comprises 0.8% of North American agriculture (Willard and Lernoud 2016).
United States Government	55	1674	55	1674	This paragraph on agroecology is not balanced. Considering including the following: "Agroecology is an alternative to conventional agriculture that builds on local knowledge and innovation, which could complement other agricultural approaches to contribute to sustainable intensification on farms."	Ok, included the suggestion
United States Government	55	1683	55	1684	Please delete "and the Cubans were forced into self-reliance". It is not necessary for the main point of the sentence and the word choice is subjective. .	Ok, changed the wording

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	55	1694	55	1703	Again even only narrative at subregional scale when there are many trends data on the changes in carbonate shell species due to acidification. And some of the narrative is highly speculative, such as 1702-03, when the laboratory sensitivity has yet to be documented in the field. Not saying such information should not be presented, but its speculative nature should be made clear to readers, (especially when the citation is not in the reference list, and when it is look up, the treatment levels were much higher than any current levels of CO2 and Acidification, Focus should be on cases where there is the best data, not the most attention-getting speculation.	We revised the specified lines. There is not enough space to include much quantitative data after the need to describe what increases or decreases the driver's intensity for the region, as was required by the guidelines.
Co-chairs	56	1704	56	1714	This is not about nature and NCP. It is an important consideration about air pollution from internal combustion engines, but is the business of IPCC, not IPBES.	We have not removed this text because clean air is one of nature's contributions to people, and a driver of change in clean air is fossil fuel emissions.
Co-chairs	56	1715	56	1729	NA is more than the US. Give subregion scale information and evidence, not just narrative.	We added some quantitative information about Canada.
Co-chairs	56	1732	56	1744	There is even more a need here to give some trend information. This list of possible negative effects would be just as true for any other subarea of the Americas, and probably any other region. The source paper just addresses the US, but the effects are not unique to the US. Only the magnitude of the effects would be relevant to NA (or at least to US), and there is nothing on that information, which should be the basis of the assessment.	The effects of N deposition on forests has not been extensively studied except for temperate and boreal forests of North America. Not very much is known for other forests. It would be speculative to generalize more than we currently have when we describe the nature of this driver in the early part of this section.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	56	1745	58	1793	At least for these three groups of pollutants, there is some trend data on the concentrations of the chemicals. There isn't any corresponding information on the magnitude of change it caused in biodiversity, so readers still have no insight into how great a driver of change in biodiversity and NCP the chemicals actually are. But at least there is some insight available on trends in the pollutant levels, even if in th POP case even the trend data is expressed in relative terms not actual amounts.	We cannot do more here for reasons of space.
Thomas Brooks	57	1754	57	1754	Add a sentence or two here on the use and impacts of systemic pesticides - see Environmental Science & Pollution Research (Jan 2015) Worldwide Integrated Assessment of the Impacts of Systemic Pesticides on Biodiversity and Ecosystems (http://www.tfsp.info/)	Added the following: New classes of pesticides have been developed and introduced and are now widely used, but have documented environmental issues such as the persistent, systemic and neurotoxic neonicotinoids and fipronil, introduced in the early 1990s. The use of these insecticides have been related to the disappearance of honey bees as well as other insect and insect eating birds. Neonicotinoids and fipronil are found in nectar and pollen of treated crops such as maize, oilseed rape and sunflower and also in flowers of wild plants growing in farmland. They have also been detected at much higher concentrations in guttation drops exuded by many crops (van Lexmond et al, 2015).

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		1779		1780	Quantify changes in each of these nutrient by sub-region- "biogeochemical cycles of major nutrients (N, C, P, S). "	Ok, added the following: New classes of pesticides have been developed and introduced and are now widely used, but have documented environmental issues such as the persistent, systemic and neurotoxic neonicotinoids and fipronil, introduced in the early 1990s. The use of these insecticides have been related to the disappearance of honey bees as well as other insect and insect eating birds. Neonicotinoids and fipronil are found in nectar and pollen of treated crops such as maize, oilseed rape and sunflower and also in flowers of wild plants growing in farmland. They have also been detected at much higher concentrations in guttation drops exuded by many crops (van Lexmond et al, 2015).

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	58	1794	58	1827	The treatment of mercury is back to only narrative. The only number in the long section is what percent of mercury is of anthropogenic origin inArctic marine food webs, and the increase of atmospheric Hg in China. There are many studies with data that could illustrate trends in this driver, not just a descripton that the levels are increasing in the environment and in animals.	It is more important to give information on whether mercury levels are great enough to affect biodiversity and nature's contributions to people than it is to give absolute numbers or trends, which is what this text does. This comment contradicts earlier comments from this Reviewer Name suggesting that absolute numbers are not relevant to readers. We cannot do more here for reasons of space. Graphs of mercury trends included in the first draft were removed due to space limitations.
United States Government	58	1804	58	1804	Need to indicate what Hg stands for when first used; similar issue with Pb.	This change has been made.
Pomerleau, C.	58	1815	58	1815	Please add a citation/reference after "The mercury burden in the Arctic marine food web is now 92% from man-made sources".	The reference appeared two sentences later. We now cite it twice for clarity.
United States Government	58	1829	58	1831	These sentences are speculative and beyond the scope of this assessment; please delete.	We have edited these lines and added references. Governance is considered a driver of change in biodiversity and is well within the scope of the assessment.
Co-chairs	58	1830	58	1831	techniclaly this is policy analysis and should be in Chapter 6, not here.	We have edited these lines and added references. According to IPBES guidelines, governance is considered a driver of change in biodiversity and is well within the scope of the assessment.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Cristobal Diaz	59	1836	60	1885	In their contain are mixed aspects of the Caribbean. I suggest to put all in the Caribbean	We have edited these lines and added references. According to IPBES guidelines, governance is considered a driver of change in biodiversity and is well within the scope of the assessment.
Pomerleau, C.	59	1837	59	1837	Please add the information about the magnitude in pH decrease between 1991-2011 or provide an example of the decrease over that time period for one location.	The trends in pH vary among the 10 different ocean biomes that border the Americas, with several different biomes for most of the subregions. As a result, we do not have space to describe all of them.
Co-chairs	59	1837	59	1850	Again, all this is narrative. There are vry good trend data on coral reefs in the MA portion of the Caribbean and the Pacific coast and some illustrative material should be the focus, not descriptive information of the impacts of acidification on coral reefs, which is true for all coral reefs, not jsut those in MesoAmerica	We have added a figure showing aragonite saturation trends in the Caribbean Sea.
Numa P. Pavón Hernández	59	1849	59	1849	Change by italics for scientific name of reef urchin	We made this change.
Co-chairs	59	1850			Just that this seems to be the first actual trend information in the MesoAmerica section. As with the material on other types of drivers, the narrative material on what types of environemtnal consequences these chemicals have are in no way specific to MesoAmerica. They should have all been presened generically whent he driver itself was introduced. These all these subregional sections could focus on the policy-relevant task - presenting the actual trends in the contaminants and, where information is availabe, trends inthe things that the contaminants were expected to impact. It would be a much shorted and tighter presentation of the material, and better illustrate what is established, what is uncetain but supported by some evidence from the subarea, and what is specuation and inference.	We do not understand this comment.
Numa P. Pavón Hernández	59	1850	59	1850	Wilkinson, C. R., & Souter, D. N. (Eds.). (2008). Status of Caribbean coral reefs after bleaching and hurricanes in 2005 (Vol. 148). Global Coral Reef Monitoring Network.	We cannot add more on Caribbean coral reefs for reasons of space

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Virginia Meléndez Ramírez	59	1863	59	1863	Include table for Mexico	We cannot do this here for reasons of space
E. Arguedas y C. Roldán	59	1867	59	1871	Regarding pineapple cultivation, Costa Rica is one of the main exporter. Research carried out by the National University (UNA) and researchers of the Regional Institute of Studies on Toxic Substances (IRET) since 2001, demonstrated the contamination by Bromacil in waters of wells and nascent, (herbicide used in the pineapple). After more than 12 years of pressure from communities, organizations and researchers, in 2017 a decision was made to ban the pesticide.	We cannot do this here for reasons of space
Co-chairs	60	1879	60	1880	In another section of mostly narrative but at least a small amount of information on magnitude and trend, this editorializing goes beyond the assessment mandate is speculative and nearly policy prescriptive. What would be appropriate here is some information on how much of this 28% is indeed unregulated.	We deleted this sentence.
Co-chairs	60	1884	60	1897	There are trend data on Caribbean coral reefs and acidification. And note that figure 4.6 has nothing to do with coral reefs or any drivers affecting them. The relevant figure is in the Text Box and the figure labels 4.6 is misplaced and misnumbered.	We have added back into the chapter a figure on trends in acidification that was removed from the first order draft due to reasons of space.
Virginia Meléndez Ramírez	61	1917	61	1917	Fig. 4.6 is from Peru and is in the Caribbean section.	The figure has been moved to the correct position.
David Loreto	62	1921	62	1922	Box 4. 6. Regarding the statement: "Caribbean coral reefs are subject to a variety of other stressors that reduce reef resilience to acidification (Anthony et al., 2011; Woodridge and Doney 2009)", it is suggested to review the statement since it seems that what is spoken is of the reduction of reef resistance to acidification and not of resilience proper.	We changed resilience to resistance in this sentence.
David Loreto	62	1921	62	1922	Box 4. 6. Regarding the statement: "Caribbean coral reefs are subject to a variety of other stressors that reduce reef resilience to acidification (Anthony et al., 2011; Woodridge and Doney 2009)", it is suggested to review the statement since it seems that what is spoken is of the reduction of reef resistance to acidification and not of resilience proper.	We changed resilience to resistance in this sentence.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	62	1928	63	1940	This material on ocean acidification illustrates the inefficiency of the approach taken to this entire section on direct drivers. It is almost all narrative with geographic areas mentioned but extremely little actual data. Of the narrative, most is explaining things like the differential vulnerability of colder vs warmer waters to the effects of acidification and deoxygenation, the greater vulnerability of species at the limits of their range than cetera, etc. These factors may well be true, but they are not in any way specific to SA. They are globally true. In various and usually piecemeal ways they have already been presented for the other sub-regions. The introduction to each of these drivers should cover all these considerations only once. Then some form of efficient and small table can just list the considerations with no narrative explanation, the data from a relevant knowledge source on their magnitude and trend and list the geographic areas or species which illustrate the presence of the consideration in the subareas - particularly for ones where there are actually some data on its effect. Less repetition and greater consistency among the subregions, and hopefully greater quantitative information rather than just generalizations that all these drivers can have negative effects.	Thank you for your comment. The structure of the text cannot be greatly changed now for reasons of time. The guidelines did not specify the structure of the text to this degree of detail.
Co-chairs	63	1941	63	1946	This just seems to be a list of pressures on the drainage. If the information has a place in the assessment, it is chapter 2 or maybe 3. It has no insights about drivers, so it is not for Chapter 4.	These lines were deleted.
Co-chairs	63	1947	63	1955	Of the material in this paragraph, 1950-1951 are what was expected for Chapter 4. 1952-1955 on amount of production is Chapter 2 and 3.	Deleted the lines 1952-55.
Brenda McAfee	63	1953	63	1955	Are Brazil and Argentina the only countries that grow GLYT soybeans while Paraguay, Bolivia and Uruguay grow non-GlyT soybeans? This could be clarified.	This section was deleted.
Co-chairs	63	1956	64	2008	The long comment on 1928-1940 applies to all this text. This is a repetition of globally true information on the mechanisms by which the driver effects nature and NCP - all material that should be presented only once in the chapter rather than separately repeated in each subregion. The subregional sections stick to where those mechanisms have been observed, with some indication of current magnitude and recent trend, and some scope for listing other places where there may be no data but particularly high exposure.	These lines focus on the status of certain drivers as they apply to specific South American rivers rather than give general information on the natures of drivers.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	65	2009	65	Box 4.7	First, this should be placed with NA, not following SA. Moreover the narrative on its history is for chapter 2 not chapter 4 and more seriously the long first paragraph on its population is solely about its colonization, and does not mention the indigenous people who comprise nearly 90% of the populations. And again, probably half the rest of the text is just telling how so drivers act - material already presented. On the very positive side, though, it does have a higher proportion of actual data from the various knowledge systems that is the case for most of 4.4.2. If this much information can be found for a place as remote and poorly studied as Greenland, it can be found for the rest of the Americas.	The extraneous material was deleted.
Virginia Meléndez Ramírez	65	2009	65	2009	Box 4.7 Explain and refer in text this box.	
United States Government	65	2009	80	2492	The marine environment is only mentioned under the Caribbean heading (page 75 of chapter 4). It does mention continued warming in N. Atlantic, and concerns about coral reef resources in the Caribbean and Gulf of Mexico. For the sentence “These changes are expected to have an impact on suitable habitat of a number of valuable fish and affect fisheries that depend on them” the references are relevant only to tuna resources—there are many other appropriate references. There are other concerns that could be added: ocean acidification off Washington, warm blob off California, changes in distribution and abundances, especially off Alaska and NE US, etc.	Added more references to the end of sentence that pertain to a variety of fish species (in addition to tuna); the discussion of North Atlantic Ocean was moved to the NA section; added information on warm blob and community composition changes in AK; section 4.4.2 covers ocean acidification in the oceans, so it was not repeated here.
Anna Yusa (Health Canada)	66	2013			It may be relevant, if possible, to refer to how climate change is expected to impact the distribution/ abundance of certain organisms, including those that are important disease vectors with climate change. For example, on anticipated changes in the distribution of ticks and mosquitoes, or on the distribution and survival and plants of interest (e.g. ragweed). This seems different from the discussion of climate change as a driver of biological invasions.	noted and completed
Diego Pacheco	66	2013	81	2496	There is the need to summarize this part of the section and to highlight better the main findings regarding climate change and its impacts on biodiversity by biomes. I suggest more use of infographics in order to improve comparison among subregions in America.	We cannot do this here for reasons of space

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	66	2013	81	2495	As mentioned, it would be helpful to organise/focus information according to main topics; for instance: (1) importance/dimension of climate change by subregions/ habitats; (2) current status, trends and projections by subregions; (3) risks and opportunities, and optionally (4) policy and management options.	Will be done with new table for the whole chapter
Liliana Bravo-Monroy	66	2013	81	2495	As stated above, a challenge could be unifying both parts of the section (lines 2014-2147; lines 2148-2495) by connecting/comparing/ contrasting the effect/impact of mentioned factors (e.g., GHG emissions, ENSO, vulnerability) on habitats of each subregion, making reference of spatial and temporal scales being examined. Despite the fact that cases are cited and localised, more cases and details would strengthen the section. On the other side, given that North America (USA) contributes with one of the highest concentrations of GHE to the planet, that information could be provided according to subregions.	We cannot do this here for reasons of space
Bob Watson		2013			4.4.3. Climate Change- This section needs quantification of changes in atmospheric concentrations, temperature, precipitation and sea level and ensure consistency with IPCC WG I – fifth assessment report	
Co-chairs	66	2014	66	2035	This is a good and concise summary of the IPCC AR findings. What makes the text have high impact and be concise is that the core is quantitative informaton on trend and status. As early IPCC reports found, generalizations without data had little policy impact. Good data needed little narrative to have high impact. IPBES was supposed to have taken this lesson as a starting point. This make sthe extremely thin quantitaitve content in 4.4.1 adn 4.4.2 a major weakness in the entire IPBES regional assessment.	Thank you for this comment
Numa P. Pavón Hernández	66	2022	66	2022	(0.1 ppm = 100 ppb)	Noted and completed

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		2023		2028	Better: The last report of the IPCC (IPCC, 2014) indicates that the atmospheric concentrations of GHG from anthropogenic sources have increased since the pre-industrial era significantly because economic and population growth, and that they (carbon dioxide, methane and nitrous oxide) are now higher than any time in the last 800,000 years. The IPCC reports that this significant increase in GHG has caused a warming of 0.85°C on average globally (land and ocean surface combined) over the period 1880 to 2012.	
Bob Watson		2026			"any time in the last 800,000 years. " - Replace "ever" because it is wrong – be factual	Noted and completed
Bob Watson		2026			Add a asentence quantifying the current concentrations	
Bob Watson		2028			Add a sentence noting that WMO has recently reported that the global average temperature has now exceeded 1oC	
Bob Watson		2031			What is GWP 100?????- "CO2-equivalents based on GWP100 from the IPCC Second Assessment Report) (IPCC, WGIII, 2014)."	Noted and completed
Liliana Bravo-Monroy	67	2040	68	2061	Figures 4.8 and 4.9. Interesting infographies. It would be helpful to also illustrate particular information localised and/or from the Americas' subregions.	Noted and completed
Virginia Meléndez Ramírez	67	2041	67	2041	Fig 4.8 Complete the foot of figure e.g. AFOLU =	Noted and completed

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
MINAM	67	2044	67	2046	<p>When referring to scenarios, the text mentions: increase in the probability of greater occurrence and duration of heat waves, extreme precipitation with greater frequency and regional scope, sea acidification, increase in sea temperature, and increase in sea level. With this line of thought, the following aspects should also be mentioned: increase in intensity and frequency of droughts, frosts and extreme cold, creation of glacial lagoons, and the increase in the water level of the lagoons near retreating glaciers.</p> <p>Al hacer referencia a los escenarios mencionan el incremento de probabilidades de mayor ocurrencia y duración de olas de calor, eventos de extrema precipitación de mayor intensidad y frecuencia en muchas regiones, acidificación e incremento de la temperatura y nivel del mar. En ese sentido se pide adicionarse lo siguiente: incremento en intensidad y frecuencia de sequías, heladas y friajes además de la formación de lagunas glaciares y el aumento del nivel de las lagunas cercanas a los glaciares en retroceso.</p>	
Bob Watson		2044		2038	<p>Better: The IPCC developed the Representative Concentration Pathways (RCPs) as a way of projecting how factors including population size, economic activity, lifestyle, energy use, land use patterns, technology and climate policy, will have an impact in the concentration of atmospheric GHG. There are four RCPs: a stringent mitigation scenario (RCP2.6) (this scenario is based on the goal of maintaining global warming below 2°C above pre-industrial temperatures), two intermediate scenarios (RCP4.5 and RCP6.0) and one scenario with very high GHG emissions (RCP8.5) (IPCC, 2014b).</p>	We do not understand this comment, the edit proposal matches 100% with the original text.
Bob Watson		2046			<p>"Taking in consideration the above scenarios, the IPCC reported that in all of them the surface temperature is projected to rise"- quantify</p>	Noted and completed
Bob Watson		2046			<p>"The ocean will continue to warm and acidify and global mean sea level to rise" - quantify</p>	
Numa P. Pavón Hernández	67	2046	67	2046	<p>It may be appropriate to include IPCC mitigation targets.</p>	The new structure of the chapter hopefully makes this clearer

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		2047			Biodiversity is already being impacted by climate change	Noted and completed
Bob Watson		2047		2046	Suggested edition "Taking in consideration the above scenarios, the IPCC reported that in all of them the surface temperature is projected to rise. Furthermore, it is very likely that heat waves will occur more often and last longer, and that extreme precipitation events, both floods and droughts, will become more intense and frequent in many regions. The ocean will continue to warm and acidify and global mean sea level to rise. "	Noted and completed
Co-chairs	67	2052			the Scheffers et al. paper is clearly central to the entire section, and is not in the reference list.	Reference was added and cited in Mendeley
MINAM	67	2054	67	2057	Considering that endemic species are more vulnerable to the effects of climate change, some of the related impacts should be mentioned. This is important for countries that have a significant rate of endemism such as Peru. For example the habitats for the spectacled bear (Andean Bear) or ecosystems, such as the andean tundra or "páramos", dry forests, among others Tomando en cuenta que las especies endémicas son mas vulnerables a los efectos del cambio climático, debería mencionarse algunos de los impactos sobre ellas; esto es importante para países que cuentan con una tasa importante de endemismo como el Perú. Por ejemplo los habitats para el Oso de Anteojo, los ecosistemas de paramos, bosques seco, entre otros.	This is out of the scope of our chapter, we are focused on biomes/units of analysis.
Margarita N. Lavidés	68	2059	68	2059	Correct: "manirne" to marine	
Dalia M. Salabarría	68	2063	69	2105	There should be an special and deeper treatment to the Climate Change impacts on Small Islands of Caribbean because it is recognized that vulnerability and fragility of island ecosystems increase the severity of changes, on biodiversity and ecosystem services, also, taking into account that the great majority of island populations, live in or close to the coast, and their economy depends on biodiversity and ecosystems services.	Agree. We are going to make a case study for this and other drivers

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	68	2063	69	2084	Continuing the theme of comments on 4.4.1 and 4.4.2 this section is a good presentaiton of the types of mechanisms by which climate change can affect nature and NCP. So the mechanisms do not have to keep being explained n narratives by subregion. Concise lists of the pathway, the place(s) where its effects have been observed and the trend in those effects is all that is needed in the rest of the section.	Text was condensed in areas where subregion narratives may have been repetitive with prior section or other chapters
MINAM	68	2065	68	2066	Reference is made to the warm and cold phases of El Niño phenomenon . It should also be mentioned that in 2017 this event was atypical, and has been therefore called coastal child. Se hace referencia a las fases cálidas y frías del Fenómeno del Niño, se debería considerar también que este Fenomeno en algunas ocasiones como en el 2017 en Perú, ha presentado condiciones atípicas por las cuales se le ha llamado El Niño Costero.	We cannot do this here for reasons of space
Ederson A Zanetti	69	2084	69	2084	There should be a couple of paragraphs on CO2 atmospheric concentration and increase on net production of vegetation	Great comment, but don't match to the text mentioned
MAYDS- Argentina	69	2085	69	2090	Este párrafo entendemos que es controvertido. El párrafo establece una relación de causalidad entre la pobreza y el agravamiento del cambio climático, desde la perspectiva de la pérdida de carbono en suelos. Esta aseveración invierte el orden causalidad, en el que el cambio climático es el fenómeno que puede agravar condiciones de pobreza y desigualdad. Sugerimos la remoción de dicho párrafo.	Paragraph was removed
Bob Watson		2085			"Poverty may have implications for intensifying climate change"- Please explain the link	Paragraph removed at the suggestion of comment #605
María Evelinda Santiago Jiménez	69	2085	69	2090	Involve higher education institutions through the promotion of integrative projects for students and teachers to solve environmental and social problems through the development of artifacts and systems generated by inter and transdisciplinary knowledge. Bring the school out of classrooms in order to get involved with socio-environmental issues.	Thank you for this comment
Bob Watson		2087			What does increase soil mean?	Paragraph removed at the suggestion of comment #605

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	69	2087	69	2087	This sentence is incomplete. Does it mean to say increase in soil erosion? Please revise and clarify.	Paragraph removed at the suggestion of comment #605
Numa P. Pavón Hernández	69	2090	69	2090	It may be appropriate to include REDD+ strategy	
Co-chairs	69	2091	69	2013	How large are these effects projected to be. The generalizations are a start, but for the chapter to have value to the rest of the assessment, particularly chapters 5 and 6, there has to be at least some information on magnitude of these effects. A lot of work has been done to produce bounded projections in the IPCC reports, but nothing is reported here. It should be extracted from the sources and used effectively in the chapter.	Will be done with new table for the whole chapter
Bob Watson		2092			"Under all the RCP scenarios, the extinction risk of a large fraction of terrestrial and freshwater species by climate change in the 21st century " - Quantify – use IPCC numbers (it is not a large fraction)	Thank you for this comment
Pomerleau, C.	69	2104	69	2105	Could you add a reference?	noted and completed
MINAM	69	2104	69	2105	It is suggested that climate change will reduce existing populations and species viability, it should be noted that endemic species will be particularly sensitive to the effects of climate change. Se indica que el cambio climático reducirá las poblaciones en vigor y viabilidad de especies, se debería señalar que las especies endémicas serán especialmente sensibles a los efectos del cambio climático.	Noted and completed

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
MINAM	69	2106	69	2106	<p>Regarding the effects of temperature increase of seawater, in the case of Peru, it is likely that an increase in temperature will alter the dynamics of the sea related to the upwelling of nutrients of the seabed. This as a result of a probable oscillation of the thermocline, which could impacting on the marine ecosystem and the ecological interactions of the marine environment.</p> <p>Respecto a los efectos del incremento de la temperatura en el mar para el caso peruano, es probable que el incremento de la temperatura altere la dinamica del mar relacionada al afloramiento de los nutrientes del fondo marino, ocasionada por la probable oscilación de la termoclina; impactando en el ecosistema marino y las interacciones ecológicas del medio marino.</p>	Thank you for this comment
Co-chairs	69	2106	70	2134	<p>Same as the previous comment. There are quantitative estimates of some of these pathways of change in the IPCC reports (sea level rise, warming etc; and studies of things link projected changes in ranges of marine species. The narrative with none of the trend or magnitude information reduces the value of the section to the rest of the assessment and the potential impact of the assessment on the policy discussions.</p>	
Dalia M. Salabarría	69	2107	70	2034	<p>Related to marine ecosystems, certainly, there are 3 main drivers with negative impacts to coastal and marine areas, but they have a lot of very strong implications, such as: backward movement of coastal line; strong inundations in low-lying areas; appearance of invasive species after hydro-meteorological events; changes of behaviour of some native species; increment of waves intensity, increase of erosion and salinity at coastal areas, affecting directly biodiversity, ecosystems services and all the coastal ecosystems and their services, and to the population, between others.</p>	Thank you for this comment
Bob Watson		2110			<p>Focus on the Americas- "The economic dimension of these changes is different across the world, where species richness and fisheries catch potential are projected to increase (on average) at mid and high latitudes, contrary to what would happen in tropical latitudes."</p>	Noted and completed

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Cristobal Diaz	69	2113	69	2115	I suggest add: "1. Sea level rise, which is related to the capacity of animals (e.g. corals) and plants (e.g. mangroves) to keep up with the vertical rise of sea, and their influence on coastal groundwater watersheds mainly in Caribbean islands;	Thank you for this comment
Bob Watson		2113			"Three main drivers related to climate change and emissions of carbon dioxide will have a negative impact on coastal ecosystems: "- This is needed as ocean acidification is not caused by climate change	Noted and completed
United States Government	69	2113	69	2120	Consider including a discussion on the positive impacts of ocean warming for some species. For more information: http://onlinelibrary.wiley.com/doi/10.1890/08-1863.1/abstract .	We cannot do this here for reasons of space
Pomerleau, C.	70	2126	70	2126	Maybe you could specify if interspecific competition?	Thank you for this comment
Co-chairs	71	2136	71	2145	We assume the names in the cells are references, but that should be explained in the caption and year as well as name given. Also if references are given for some cells and not for others, the reason why some effects are documentd and others are not should also be explained.	This section/parragraph has been deleted
Ederson A Zanetti	71	2137	71	2137	There should be a collumn for increase on atmospheric co2 and fertilization of different analytical unit	This section/parragraph has been deleted
Liliana Bravo-Monroy	71	2137	71	2146	Table 4.15. Interesting information. It would be useful to support table on study cases that show how has been the impact of climate change in two contrasting biomes.	This section/parragraph has been deleted
Bob Watson		2137		2144	table 4.15 - What is the baseline for have increased, have decreased and not changed	This section/parragraph has been deleted
Luis Ubaldo Castruita Esparza	71	2145	71	2145	For temperate forests extreme events (weather related); (Villanueva et al., 2013), (Cerano et al., 2011; Stahle et al., 2009), and, (Castruita et al., 2016)	This section/parragraph has been deleted
Cristobal Diaz	71	2145	Table 4.15-71	2146	I think that exists a mistake in: Insular and linear coastal areas - the temperature is rising in last 20 years ↑ and precipitation decreased in the last 20 years and cyclical return of drought ↓	
Liliana Bravo-Monroy	72	2148	79	2443	Subregions. The use of maps, figures and/or tables would be highly useful. Thus habitats and effects might be depicted/contrasted.	We cannot do this here for reasons of space

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	73	2148	74	2254	Although the NA climate change section started off encouragingly with some actual numbers for the boreal and temperate forests and tundra, all the rest continues to be anecdotal and lacking even semi-quantitative information on past or projected future magnitudes of these changes. This is a topic with extensive monitoring and modelling in NA, and such quantitative information is available in the literature, It should be summarized and presented within the uncertainty framework of IPBES (and IPCC), rather than just relying on unqualified generalizations.	For biome shifts of boreal and temperate forest in response to climate change, we added a sentences in the paragraph that originally spanned lines 2161-2173. We have added quantitative estimates for forest composition changes in Alaska to this paragraph. Quantitative estimates for changes in the composition of tundra in Alaska were provided in the paragraph that originally spanned lines 2195-2198.
Co-chairs	72	2171	73	2207	There are no data or information for Canada? It has by far the greatest geographic extent of tundra in NA, and it not mentioned.	The number of tundra ecological studies in Canada are much fewer than in Alaska, although more new studies of tundra ecology in Canada have recently been initiated. We have added a sentence at the end of original line 2179 to convey this information. As almost all of the synthetic work on tundra in North America has come from studies conducted in Alaska, we have focused on citing the most synthetic work that is most relevant to tundra in North America, including the synthesis article by Myers-Smith et al. (2011), which includes information from research on shrub dynamics in the Canadian Arctic

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Harald Pauli	72	2174	73	2207	alpine/high mountain habitats are not considered here, but are expected to experience considerable shrinkage and associated biodiversity losses through upwards shifting species ranges. 'For example Lesica (2014) found declines of arctic-alpine species in Montana throughr two decades of observation.' Ref.: 'Lesica P (2014) Arctic-alpine plants decline over two decades in Glacier National Park, Montana, U.S.A. Arctic Antarctic and Alpine Research, 46, 327-332.'	We have added sentences at the end of original lines 2179 and 2198 to provide this information.
Co-chairs	72	2174	72	2179	The Arctic tundra bioiversity has been very well characterized and does not need to be repeated here.	Thank you for your comment
Pomerleau, C.	72	2180	72	2180	Instead of "at the Arctic" change to "in the Arctic region".	The wording has been improved
Co-chairs	73	2202			Since there are no forests in Greenland, nor even trees on the ICE Sheet itself, the relevance of predicted increases in forests fires is not obvious. Clarify or delete.	The mention of forest fires has been removed.
Co-chairs	74	2226	74	2236	There is a great deal more coastal wetlands in NA than just the Florida everglades. Be more inclusive	We cannot do this here for reasons of space
United States Government	74	2238	74	2240	Are there more recent citations for this? If so, please include.	Thank you for your comment
Virginia Meléndez Ramírez	74	2255	74	2255	There is little information for Mesoamerica, it can include more information: Cambio climático y sus efectos en la biodiversidad de América Latina http://repositorio.cepal.org/bitstream/handle/11362/39855/S1501295_en.pdf;jsessionid=3910FBE6A698C0D3F83C13240B8D0F78?sequence=1 Check tables and figures, in this work there is also information on Protected Natural Areas.	Added reference and provided more information for Mesoamerica, including information on cloud forests and wetlands
Ederson A Zanetti	75	2264	75	2280	There should be mention and data about increasing atmospheric co2 and fertilization, with the increase on Net Production and consequences for species adaptation	We cannot do this here for reasons of space

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Enrique Pérez	74	2271	74	2271	<p>“The coming climate changes appear very likely to upset the current dynamic equilibrium of the cloud forest. Results will include biodiversity loss, altitude shifts in species’ ranges and subsequent community reshuffling, and possibly forest death. Difficulties for cloud forest species to survive in climate-induced migrations include no remaining location with a suitable climate, no pristine location to colonize, migration rates or establishment rates that cannot keep up with climate change rates and new species interactions”.</p> <p>Difficulties for cloud forest species to survive in climate-induced migrations include no remaining location with a suitable climate, no pristine location to colonize, migration rates or establishment rates that cannot keep up with climate change rates and new species interactions. Aside from changes in temperature, precipitation, and cloudiness, other climate changes may include increasing dry seasons, droughts, hurricanes and intense rain storms, all of which might increase damage to the cloud forest.</p> <p>Foster, P. (2001). The potential negative impacts of global climate change on tropical montane cloud forests. <i>Earth-Science Reviews</i>, 55(1), 73-106.</p> <p>“Using Maxent, we estimated the potential distribution of cloud forest for three different time horizons (2030, 2050 and 2080) and their overlap with protected areas. Then, we calculated the extinction risk of three contrasting vertebrate species for two scenarios: (1) climate change only (all suitable areas of cloud forest through time) and (2) climate and land-use change (only suitable areas within a currently protected area), using an explicit patch-occupancy approximation model and calculating the joint probability of all populations becoming extinct when the number of remaining patches was less than five ”</p>	<p>Foster reference was already included in section; added information from Ponce-Reyes et al and cited in Mendeley</p>

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	75	2285	75	2289	Although it is certainly true that climate change impacts on wetlands have less studies than forested areas in MA, it is not that the case that they have been unstudied, which is the very strong implication here. Moreover, there is no mention whatsoever of coastal and insular areas. Both need more focused effort, with appropriate collaborators, to fill this unnecessary gap. On the positive side, many of these statements on the firsts in MA actually have some quantitative information, making the information in the section more useful to policy making and informing civil society than more general statements would be..	This section was edited to include more information on wetlands, including coastal wetlands and mangrove swamps
Co-chairs	75	2290	76	2324	there is a large literature on the magnitude and trend in many of these considerations, with areas/topics like the rates of coral reef bleaching particularly well quantified. Some data, rather than just generalizations most of the readership will already know are important here.	Added literature related to magnitude of sea level rise, coral bleaching, and implications of increasing water temperatures for fisheries
Philip M. Fearnside	75	2299	75	2306	In addition to the effects of temperature and rainfall mentioned here, the potential effect of CO2 fertilization should also be mentioned. This favors the already apparent increase in lianas in Amazonian forest, which kills trees. See: Laurance, W.F.; A.S. Andrade, A. Magrath, J.L.C. Camargo, M. Campbell, P.M. Fearnside, W. Edwards, J.J. Valsko, T.E. Lovejoy & S.G. Laurance. 2014a. Apparent environmental synergism drives the dynamics of Amazonian forest fragments. Ecology 95(11): 3018-3026. doi: 10.1890/14-0330.1 Laurance, W.F., A.S. Andrade, A. Magrath, J.L.C. Camargo, J.J. Valsko, M. Campbell, P.M. Fearnside, W. Edwards, T.E. Lovejoy & S.G. Laurance. 2014b. Long-term changes in liana abundance and forest dynamics in undisturbed Amazonian forests. Ecology 95(6): 1604-1611.. doi: 10.1890/13-1571.1	This is covered in other drivers

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Philip M. Fearnside	75	2299	75	2306	<p>Mention needs to be made of the synergism between increasing droughts due to climate change and forest fires, which lead to degradation and eventual loss of Amazonian forest. See: Barlow, J., and C.A. Peres 2008. Fire-mediated dieback and compositional cascade in an Amazonian forest. Philosophical Transactions of the Royal Society B, 363:1787–1794. [doi: 10.1098/rstb.2007.0013].</p> <p>Barlow, J. et al. 2016. Anthropogenic disturbance in tropical forests can double biodiversity loss from deforestation. Nature 535: 144–147. doi: 10.1038/nature18326.</p> <p>Vasconcelos, S.S., P.M. Fearnside, P.M.L.A. Graça, E.M. Nogueira, L.C. de Oliveira & E.O. Figueiredo. 2013. Forest fires in southwestern Brazilian Amazonia: Estimates of area and potential carbon emissions. Forest Ecology and Management 291: 199-208. doi: 10.1016/j.foreco.2012.11.044</p>	We cannot do this here for reasons of space
Co-chairs	75	2299	75	2306	Although the statements about the need for better policies to prevent deforestation and reduce the likelihood and severity of landslides during severe rains may be correct, it is material for chapter 6 and belongs there, not here.	Thank you for your comment
Dalia M. Salabarría	75	2304	75	2324	Should say: Protecting forest, all the coastal and marine ecosystems, because there are several ecosystems interrelated and interdependent, functioning as a whole system, such as: mangrove, coastal wetland, coastal lagoons, seagrass bed, and coral reef and an adequate protection and management of water basin to reduce vulnerability and increase resilience will be important adaptation measures.....	Thank you for your comment
David Loreto	75	2304	75	2306	To reconsider that the adaptation is a characteristic of the resilience and not, how is it raised, that resilience is an adaptation strategy	Thank you for your comment
David Loreto	75	2304	75	2306	To reconsider that the adaptation is a characteristic of the resilience and not, how is it raised, that resilience is an adaptation strategy	
Ederson A Zanetti	76	2325	76	2426	there should be a couple of paragraphs on increasing atmospheric CO ₂ and fertilization, with the increase on productivity at different biomes	This is covered in other drivers

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	76	2325	78	2443	All of this section, but more generally all the climate change section is far more about the impacts of the driver on BES than about the status and trends in the drivers. It is spending much too much space on material that belongs in Chapters 2 and 3, and giving far too little attention to the patterns in the actual driver information, that the other chapters have to assume will be presented here.	The new structure of the chapter hopefully makes this clearer
Co-chairs	76	2348	77	2370	It is striking that after warning that there is a climatic assessment devoted exclusively to the Amazonia wetlands" this is the only part so far of the SA section that has a quantitative estimate of the magnitude of and recent impacts or projected future effects. If this much quantitative information - even if uncertain - can be obtained for a biome apparently less well studied than others in SA, then a great deal more quantitative information, even if qualified, should be possible for other biomes as well, and should be added.	Quantitative estimates of recent trends and projections were added to other SA biome sections.
MINAM	77	2372	77	2374	For the Amazon, the extreme events mentioned are the most frequent, however it is suggested to include information (if possible) related to extreme cold, hurricane, winds, and fires En la Amazonía, los eventos extremos mencionados son los más frecuentes, sin embargo se sugiere incluir información (de ser posible) relacionada a friajes, vientos huracanados e incendios.	We cannot do this here for reasons of space
Liliana Bravo-Monroy	77	2381	78	2400	It would be suitable to deepen information related to Andean mountains; in particular Paramo ecosystems as emblematic case illustrating impact and projections of climate change.	We cannot do this here for reasons of space
Co-chairs	77	2427	78	2443	There is far more to the interaction of climate change with marine and coastal ecosystems than what will happen to mangroves. This is particularly important for the west coast of SA but also the south Atlantic coast. This need not be strengthened.	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	79	2444	80	2491	Climate change mitigation and adaptation strategies & Box 4.8. There would be valuable to include information that illustrates/ condenses traits as the following: Adaptation strategies of societies/farmers facing climate change (e.g., land-use change, migration, etc.); responses of social groups/farmers to climate variability; the challenge of building adaptive capacity; adaptation to climate risk by agricultural sectors; study cases of extreme weather events by subregions; how could vulnerability be reduced ? The journal "Global Environmental Change" provides useful study cases on that matter for the Americas.	We cannot do this here for reasons of space
Co-chairs	79	2444	80	2489	All this belongs in Chapter 6. There can be a short paragrph about how future trends in this direct driver will be influenced by policies countries adopt for a mitigating GHG emissions. But the discission of specific policies or groups of policies is Chpater 6, not Chapter 4. It should be moved to the right place in the assessment.	Thank your for your comment
Cristobal Diaz	79	2444	80	2487	I suggest introduce the exit of USA from Paris Accord that threaten to reach the stabilization of the climate and can controlled the affectations over biodiversity and nature's contributions to people	Thank your for your comment
United States Government	79	2444	79	2444	This discussion on adaptation/mitigation options may be better suited in a chapter that speaks to policy, governance, and human-natural interactions; consider moving.	Thank your for your comment

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Sofía Treviño Heres	79	2444	79	2455	<p>The text speaks of national legislations on climate change while presenting different efforts to implement actions. Mexico is not mentioned and it should be highlighted that since 2012 Mexico has a General Law on Climate Change, which regulates mitigation and adaptation activities, such as education, research, development and transfer of technology and innovation, and dissemination</p> <p>(http://www.inecc.gob.mx/descargas/2012_lgcc.pdf, http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC_010616.pdf).</p> <p>Mexico also developed a National Strategy on Climate Change, which was published in 2013 as the guiding instrument of national policy in the medium and long term to address the effects of climate change and to move towards a competitive, sustainable and low carbon economy (http://www.dof.gob.mx/nota_detalle.php?codigo=5301093&fecha=03/06/2013). In 2015, Mexico published the National Strategy on Climate Change vision 10-20-40, which was constructed with the support of the academy and civil society, private sector and citizens with actions to fight climate change for the next 40 years.</p> <p>(http://www.semarnat.gob.mx/archivosanteriores/informacionambiental/documentos/06_otras/ENCC.pdf)</p>	We cannot do this here for reasons of space

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Sofía Treviño Heres	79	2444	79	2455	<p>Examples of climate change mitigation and adaptation policy in México:</p> <ul style="list-style-type: none"> - Since 2012 Mexico has a General Law on Climate Change, which regulates mitigation and adaptation activities, such as education, research, development and transfer of technology and innovation, and dissemination (http://www.inecc.gob.mx/descargas/2012_lgcc.pdf, http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC_010616.pdf). - Mexico developed a National Strategy on Climate Change, which was published in 2013 as the guiding instrument of national policy in the medium and long term to address the effects of climate change and to move towards a competitive, sustainable and low carbon economy (http://www.dof.gob.mx/nota_detalle.php?codigo=5301093&fecha=03/06/2013). - In 2015, Mexico published the National Strategy on Climate Change vision 10-20-40, which was constructed with the support of the academy and civil society, private sector and citizens with actions to fight climate change for the next 40 years. (http://www.semarnat.gob.mx/archivosanteriores/informacionambiental/Documentos/06_otras/ENCC.pdf) 	We cannot do this here for reasons of space
Co-chairs	79	2460	79	2461	If salt marshes and seagrass beds are so important to carbon sequestration, why have they not been mentioned in any parts of 4.4.3 until now. It highlights the imbalance in treatment of marine and coastal patterns and trends in the drivers..	We cannot do this here for reasons of space
MINAM	79	2470	79	2474	<p>The adaptation strategies which are mentioned, contemplate planning for adaptation that is said to be linked to the public and private sector, however it should be noted that this planning must be linked to the development planning of the countries, so as to ensure their effective implementation.</p> <p>Las estrategias de adaptación a las que hacen mención, contemplan planificación para la adaptación que según se indica esta vinculada al sector público y privado, sin embargo debería puntualizarse que esta planificación debe estar articulada con la planificación del desarrollo de los países, para asegurar su implementación efectiva.</p>	Thank you for this comment

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Cristobal Diaz	79	2470	79	2474	I suggest include: In Cuba in 2017 was approved the Task Life that contain the Liniaments and tasks for the adaptation and mitigation in the main sectors of the economy and society, stakeholders, necessary financial resources, main objectives, ecosystems , main natural resources, and regions with more prioritization (ANPP, 2017) Reference: Approved document in the Cuba´s National Assembly of Popular Power/ANPP (Cuban Parliament) in July of 2017.	We cannot do this here for reasons of space
David Loreto	79	2477	79	2477	There is an adaptation strategy focused in ecosystem realized for Sierra madre Oriental in Mexico. Maybe you could include it.	We cannot do this here for reasons of space
Ederson A Zanetti	80	2489	80	2489	there should be a paragraph or two on the work CEPAL has done in latinamerica covering adaptation and mitigation policies, including specific ones for forestry	We cannot do this here for reasons of space
David Loreto	80	2489	80	2489	On the other hand, it would be very important to generate adaptive strategies based on the drives and make plausible future scenarios.	We cannot do this here for reasons of space
David Loreto	80	2490	80	2491	Box 4. 8. It is suggested to cite evidence on resilience to climate change to be clear to which they refer since adaptation, mitigation and / or resistance is not the same as resilience.	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	80	2490		Box 4.8	Although climate change does appear in box, nothing said in the box is specific to climate change. Many other factors and drivers could be substituted in almost every sentence where climate change appears and the sentence would be just as true and convey just as much (or little) information. The general points about the importance of ILK in <i>all</i> aspects of the regional assessment (and not just in climate change) are already made in Chapter 1, as part of the framework for the whole assessment, and developed in Chapter 2 with regard to what indigenous and local knowledge can contribute to documenting and understand the dependence of well-being on biodiversity. There is <i>nothing</i> in the box specifically about ILK and climate change, beyond saying Indigenous have much useful knowledge, and are highly vulnerable to some of its effects. That can be said in a sentence, and a Box that just repeats what has already been said in Chapters 1 and 2 is unnecessary. ALSO if ILK is so valuable to documenting and understanding climate change as a driver of BES, how come it has not been mentioned until this point in all of 4.4.3. IF there are no data to report in the many places where only generalizations are presented, why was ILK not used to have something more informative than broad generalizations. Serious oversight and serious inconsistency in the chapter.	
David Loreto	80	2490	80	2491	Box 4. 8. It is suggested to cite evidence on resilience to climate change to be clear to which they refer since adaptation, mitigation and / or resistance is not the same as resilience.	
Rodrigo Medellín	80	2490	80	2491	What?	
David Loreto	81	2494	81	2495	Box 4. 9. The problem is to know if we already have scientific evidence to establish the values, that is to say the thresholds, in which ecosystems may be considered to be non-resilient. In other words that both must be conserved and restored so that the ecosystems are resilient and the objective is reached?	Thank you for this comment
Liliana Bravo-Monroy	81	2494	81	2495	Box 4.9. Despite the fact that information provides a context about the importance of climate change for CBD and Aichi targets, it would be more practical to relate that info with representative cases where targets are being applied/addressed according to a particular subregion.	We cannot do this here for reasons of space

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	81	2494		Box 4.9	It is hard to tell if this box brings in the Aichi Targets because they could be relevant to future directions of the driver, or because they are policy instruments that can impact climate change. If the former a case could be made the box does belong in chapter 4. However, reading the text, it seems to be primarily about the the Aichi Targets as policy instruments. Therefore it belongs in Chapter 6, not Chapter 4.	Thank you for this comment
David Loreto	81	2494	81	2495	Box 4. 9. The problem is to know if we already have scientific evidence to establish the values, that is to say the thresholds, in which ecosystems may be considered to be non-resilient. In other words that both must be conserved and restored so that the ecosystems are resilient and the objective is reached?	Thank you for this comment
Diego Pacheco	81	2496	92	2934	There is the need to summarize to the main key findings for biomes using as possible more graphs, tables and maps as appropriate.	Noted and completed
Hanno Seebens	81	2496	92	2932	All references, which I checked, are not included in the reference list of the chapter	We cannot do this here for reasons of space
Margarita N. Lavidés	81	2496	92	2932	A matrix/table showing subregional or national information on Biological Invasions showing the IAS species scientific and common English names, origin of IAS, invaded locations, observed or expected impacts.	
Thomas Brooks	81	2496	92	2932	This section on invasive species is accurate and well-written - good!	
Liliana Bravo-Monroy	81	2497	92	2932	As mentioned, it would be helpful to organise/focus information according to main topics; for instance: (1) importance/dimension of IAS by subregions/habitats; (2) current status, trends and projections by subregions; (3) risks and opportunities, and optionally (4) policy and management options.	
Co-chairs	81	2497	82	2545	Given that there will be an entire separate assessment on IAS, almost all of the explanation of the process of invasion and its stages is unnecessary. Whether it is scientifically sound or not. Policy discussions on AIS will have the other IPBES assessment to use as background information. That's why it is being done. What the regional assessments should focus on are magnitude and trend in each region. This should be reduced by > 50% or more/	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Hanno Seebens	82	2511	82	2514	Here, "invasive" alien species are defined as those, which spread in the non-native range, while below (2518-2520) the definition by CBD is cited, which defines invasive species as those alien established species, which pose harm to the environment, humans etc. Hence, the first definition deviates from the second. I recommend to only use the later by CBD as it is the more widely accepted one, and stick to it throughout the report.	
Hanno Seebens	82	2516	82	2517	Usually, the acronym IAS is used for invasive alien species rather than "invasion alien species (IAS)". I recommend to use the frequently used meaning.	
Hanno Seebens	82	2524	82	2524	Again, IAS should be "invasive alien species" rather than "invasion alien species".	
Bob Watson		2536		2538	This issue should be discussed in more detail in the section on interactions among and between drivers- "In addition, there is increasing evidence that IAS may act synergistically with each other or with other forces of global change (e.g. climate and land use change) to produce more intense consequences for biodiversity and NCP "	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Hanno Seebens	82	2546	83	2556	<p>This sections lacks references. Here are some showing time series of alien species accumulation for various regions, which all show a continuous increase in alien species richness:</p> <ol style="list-style-type: none"> 1. Fuentes, Nicol, Eduardo Ugarte, Ingolf Kühn, and Stefan Klotz, 'Alien Plants in Chile: Inferring Invasion Periods from Herbarium Records', <i>Biological Invasions</i>, 10 (2008), 649–57 <https://doi.org/10.1007/s10530-007-9159-0> 2. Nealis, V G, I Demerchant, D Langor, M K Noseworthy, G Pohl, K Porter, and others, 'Historical Occurrence of Alien Arthropods and Pathogens on Trees in Canada', <i>Canada Journal of Forest Research</i>, 180 (2016), 1–41 <https://doi.org/10.1139/cjfr-2015-0273> 3. Aukema, Juliann E, Deborah G M Cullough, Betsy Von Holle, Andrew M Liebhold, Kerry Britton, and Susan J Frankel, 'Historical Accumulation of Nonindigenous Forest Pests in the Continental United States', <i>Bioscience</i>, 60 (2010), 886–97 <https://doi.org/10.1525/bio.2010.60.11.5> 4. Seebens, Hanno, Tim M Blackburn, Ellie E. Dyer, Piero Genovesi, Philip E Hulme, Jonathan M Jeschke, and others, 'No Saturation in the Accumulation of Alien Species Worldwide', <i>Nature Communications</i>, 8 (2017), 14435 5. Rojas-Sandoval, Julissa, and Pedro Acevedo-Rodríguez, 'Naturalization and Invasion of Alien Plants in Puerto Rico and the Virgin Islands', <i>Biological Invasions</i>, 17 (2015), 149–63 <https://doi.org/10.1007/s10530-014-0712-3> 	
Hanno Seebens	82	2546	82	2546	<p>What is meant with "movement of species by humans has increased exponentially"? That the number of introduced species increased or that the number of species in tranport increased? Should be clarified. In addition, a reference should be provided as I am not sure if the message from this sentence is true. May be better state: The number of alien species richness increased continuously during the last centuries with highest rates of invation observed today (Seebens et al. 2017)"</p> <p>Sorry for self-promotion, but our study fits nicely here: Seebens, Hanno, Tim M Blackburn, Ellie E. Dyer, Piero Genovesi, Philip E Hulme, Jonathan M Jeschke, and others, 'No Saturation in the Accumulation of Alien Species Worldwide', <i>Nature Communications</i>, 8 (2017), 14435 <https://doi.org/10.1038/ncomms14435></p>	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		2546			provide some quantification – including the estimated economic costs associated with IAS- "The movement of species by humans has increased exponentially in the last two centuries."	
Co-chairs	81	2548			This should specify the movement of people from Europe and Africa rather than movement of ?people? Generically.. There were people in the Americas for well over 10,000 years, and their presence would have been considered a baseline from which these other drivers act incrementally.	
Co-chairs	82	2549			the choice of "undermining" is a value-laden phrasing. There are ways of saying these movement swere not restricted by the isolating factors in place form the loss of the high latitude transPacific land bridge that are not as judgement. That value-based discussion should be <i>informed</i> by these assessment, aand not be assumed to be resolved when writing the regional assessments to begin with..	
Co-chairs	83	2552	83	2556	This paragraph is finally getting at the core role for AIS in the regional assessments, but nothing but generalizations are presented. For the chosen illustrations of Chile and California, what are the data - on what percent of the AISs ar specificall yof European origin, and what percept all all species are AIS?	
Hanno Seebens	83	2557	83	2559	We showed that the number of alien plant species is expected to distinctly rise until 2028 in USA, Mexico, Brasil and Argentina due to expected increases in import volumes considering a lag time between introduction and record of around 20 years. Seebens, Hanno, Franz Essl, Wayne Dawson, Nicol Fuentes, Dietmar Moser, Jan Pergl, and others, 'Global Trade Will Accelerate Plant Invasions in Emerging Economies under Climate Change', Global Change Biology, 21 (2015), 4128–40 < https://doi.org/10.1111/gcb.13021 >	
Co-chairs	83	2562			And hpow big is this "invasion debt" estimated to be - or is just soe theory for which there are no data in suppoprt?	
David Loreto	83	2572	83	2572	This paragraph or something similar is necessary to includ in previous sections	
Liliana Bravo-Monroy	83	2573	92	2932	It would be also suitable providing quantitative data based on study cases in order to present measurements of impact in particular locations.	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	83	2574	84	2679	This sections starts with saying that "North America is one of the most invaded regions of the world and also one of the most studied in terms 2574 of the number and impact of biological invasions" and then not a single number is given anywhere in the entire section, except for aquatic invasive species in coastal areas, where we do see the number documented. The individual cases listed are probably correctly presented, but the cases selected are always the extreme case in term of magnitude of impacts. This is understanding if the purpose is to alarm as well as inform, but the information is very thin. If this is indeed the best studied area in terms of AIS, we should see those numbers. How many AIS have been documented in these biomes. How many of them have had impacts on the scale of chestnut rust and Zebra mussel.	
David Loreto	83	2590	83	2590	If is possible to include some examples	
United States Government	84	2596	84	2600	Please specify/clarify if these species/taxa used as examples are IAS within the region.	
David Loreto	84	2600	84	260	Senecio inaequidens is a great example for North America and Mexico. Rzedowski, J., Vibrans, H., & Calderón de Rzedowski, G. (2003). Senecio inaequidens DC. (Compositae, Senecioneae), una maleza perjudicial introducida en México. Acta Botanica Mexicana, (63). Lopez-Garcia, M. C., & Maillet, J. (2005). Biological characteristics of an invasive South African species. Biological Invasions, 7(2), 181-194. Garcia-Serrano, H., Escarré, J., Garnier, É., & Sans, F. X. (2009). A comparative growth analysis between alien invader and native Senecio species with distinct distribution ranges.	
United States Government	84	2604	84	2604	"Irreversible" is too strong. Aggressive management and restoration can reestablish native species and ecosystem function	
United States Government	84	2605	84	2605	Need to add examples to where it currently says "(examples)."	
United States Government	84	2632	85	2637	Recommend replacing "non indigenous species" with "non-native" or "alien" species, for consistent use of terminology. Please apply throughout.	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Rodrigo Medellín	84	2634	84	2634	Not really shipping but ballast water	
Elizabeth Hess	85	2645	85	2654	Would be good to include something on Asian carp in IL. There is mention of invasive fish on 2652 but I think the economic impacts of the Asian carp are significant. See: http://www.asiancarp.org/Documents/AsianCarp.pdf	
Hanno Seebens	85	2645	85	2654	Cost estimate exist at least for USA and for specific for Dreissena (though I do not have the Dreissena reference): 1. Pimentel, D, L Lach, R Zuniga, and D Morrison, 'Environmental and Economic Costs of Nonindigenous Species in the United States', Bioscience, 50 (2000), 53–65	
Marlín Pérez Suárez		2660			Mention cases of success of invasion of Monk parakeet and Eurasian-collared dove in USA and Mexico besides its implications prospects and programs of control and eradication. In the same way, the case of the Asian-tiger mosquito and its implications on human health in Mexico	
Co-chairs	85	2660	87	2749	this is among the most quantitativ esectons in the how treatment of drivers. It gives a clear idea of the cal of the invasions, at least. However, again it seems ot give only "worst case scenarios for what the most AIS can do in varoius ecosystems. These worse=case scenarios are certainly relevant infomration for policy making, but there does need ot be some balance in presenting what is <i>typical</i> to expcet as well. Moreover, even when quantiative infomraiton is presented, in at least some of those cases the quantiative inform ation is on how abundance or widespread the AIS has become. There is no parallel quantitaitve informaiton on how large hte impact on native species r communitie is - just general statements that the impacts are large. So there is still great scope for focusing messaging more effectively, and correspondingly shortening these sections.	
Virginia Meléndez Ramírez	85	2660	85	2660	Mesoamerica: include A. mellifera invasive species: http://www2.fiu.edu/~brayd/Cairns%20et.%20al%20biotropica.pdf	
Marlín Pérez Suárez	85	2660	85	2660	Mention cases of success of invasion of Monk parakeet and Eurasian-collared dove in USA and Mexico besides its implications prospects and programs of control and eradication. In the same way, the case of the Asian-tiger mosquito and its implications on human health in Mexico	
Marlín Pérez Suárez	85	2661	85	2664	The National Commission for Knowledge and use of Biodiversity just updated the data (2016)	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Marlín Pérez Suárez		2662			The National Commission for Knowledge and use of Biodiversity just updated the data (2016)	
Marlín Pérez Suárez		2663			In which period??? Mention successful cases of eradication programs in the Mexican islands	
Marlín Pérez Suárez	85	2663	85	2663	In which period??? Mention successful cases of eradication programs in the Mexican islands	
United States Government	85	2675	85	2675	Irreversible is too strong. Aggressive management and restoration can reestablish native species and ecosystem function	
Marlín Pérez Suárez	86	2686	86	2688	It is a plague in northeastern Mexico	
Rodrigo Medellín	87	2729	87	2729	From the U.S. to Brazil!	
Rodrigo Medellín	87	2745	87	2745	Not shipping; ballast water!	
Marco Keijzer	87	2750	88	2771	I would like to propose the lionfish case as an invasive species in the Dutch Caribbean in this text or Box 4.18. Research in the Cayman Islands shows its ecological threat (top predator, eats wide range of fish, it has less competition due to overfishing, causes phase shift to algal dominated coral community by altering species composition) have a societal impact (lower fish population leads to less fishery activity, both recreational and commercial, reef degradation leads to less tourism, on which Dutch Caribbean rely for 25-30% of their GDP on, and increasing health risks as lionfish has venomous tings). This case also shows how this problem can be managed; the willingness to pay of tourists can cover costs to fund schemes for the management of the lionfish problem. Source: http://www.wolfscompany.com/the-economics-of-an-mpa-expansion-on-the-cayman-islands/ .	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Marco Keijzer (Wolfs Company)	87	2750	88	2771	I would like to propose the lionfish case as an invasive species in the Dutch Caribbean in this text or Box 4.18. Research conducted by Wolfs Company in the Cayman Islands shows its ecological threat (top predator, eats wide range of fish, it has less competition due to overfishing, causes phase shift to algal dominated coral community by altering species composition) have a societal impact (lower fish population leads to less fishery activity, both recreational and commercial, reef degradation leads to less tourism, on which Dutch Caribbean rely for 25-30% of their GDP on, and increasing health risks as lionfish has venomous tings). This case also shows how this problem can be managed; the willingness to pay of tourists can cover costs to fund schemes for the management of the lionfish problem. Source: http://www.wolfscompany.com/the-economics-of-an-mpa-expansion-on-the-cayman-islands/ .	
Co-chairs	87	2751	87	2761	This is the very first case in the entire AIS section where any positive outcomes of AIS have been mentioned, even as possibilities. Is this something unique to the Caribbean, or is it that only the authors of this subsection of the AIS story tried to provide the full and balanced picture of AIS, rather than just the worst- case scenarios.	
Co-chairs	87	2753			In these are indeed inventories, then quantitative information should be available - and in available the trend and magnitude data should be the focus of the section.	
Co-chairs	88	2762	88	2771	This is the THIRD narrative treatment of lionfish - including one in Chapter 1 to illustrate the types of BES relationships that will be in the rest of the assessment. It needs to be told only once, and referred to in all other cases. Better coordination among chapters is essential.	
Rodrigo Medellín	88	2762	88	2762	Again?	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	89	2767	89	2826	At least so far in the SA section a great deal of the text has been devoted to explaining the pathways, and not to presenting information on the magnitude and trend in the driver. The information on pathways has either already been presented in the opening part of the section on Invasive Species, or are the same as explanations of pathway that have already been presented for their subregions. Like with the other direct drivers, the result is that both the sections are all much longer than they need to be (because the pathways should be explained only once, at the beginning of each section on a direct driver, and then subarea sections could just have a table or bulleted list of examples of species characterizing the expression of the pathway in each subarea) and even though unnecessarily overlong, the sections are all very weak in presenting any hard information on how widespread the invasive species is, how much native biodiversity has been displaced, or how costly their impacts have been on human well-being. A careful reorganization would both greatly reduce length of the SA section (and most other parts of the Direct Drivers part of the Chapter) and allow it to contain much more information.	
Cristobal Diaz	88	2783	88	2784	I propose add: "The country spends millions of dollars a year to combat this species, and its great capacity for reproducing through seeds, trunks and roots makes it very difficult to eliminate. From any years one of the main strategy is to produce carbon for export	
Co-chairs	89	2793			Were these diseases new to SA and introduced by mongoose, or were the diseases already present and mongoose are just an effective transmission vector. \	
United States Government	89	2833	89	2839	Should mention why marmoset presence is related to climate change.	
United States Government	90	2846	90	2846	Please complete this sentence.	
Co-chairs	90	2848	90	2849	And to keep to the IPBES goal of policy relevant but not policy prescriptive presentation of issues. If the majority of these introductions were intentional, how great have been the commercial and aesthetic benefits from the presence of the species in Brazil.	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	90	2873	91	2893	there as similar narrative explainations of the impacts of invasiv grassleand on native grassland/savannah spcies in NA and MA, underscpring again the redundancy on the section on Direct drivers. Invasive grasses seem to have the same impact in grasslands, wherever the grasslands occur, and the pathways and impacts should be explained once. Then the subarea treatment can just focus on listing hte cases where the effects are occurring in each subarea, and their quantitative extent.	
DPG/Sbio/MMA	91	2892	91	2932	We suggest that this session mention the coral species Tubastraea coccinea andT. tagusensis, considered invasive species in Mesoamerica and South America.	
Co-chairs	91	2898	91	2900	Delete, this has been covered much earlier in the chapter. This section is about invasive species and should stay focused, to keep the length of the chapter within target size.	
Co-chairs	91	2905	91	2911	How large have these effects been?	
Co-chairs	91	2912	91	2918	This is he <i>fifth</i> narratice explanaton of lionfish, and the fourth in Chapter 4 alone. Far too much repetittion.. All that is needed is a sentence on how far it has expanded in SA, and how much native biodiversity has been lost because of it.	
Co-chairs	91	2919	92	2832	From the choice of language (e.g. "always with severe consequences not only for the local biodiversity but also from an economical perspective" and "a dramatic decrease in species richness and diversity of native seaweeds") and the list of citations, there must be quantitative informaton on extent of the invasions and magnitude of hte impacts. Som eillustrative data should be presented, not just long lists of cases with attentrion-getting adjectives reflecting hte specific value system of the author.	
juan Comerma	92	2934	92	2934	A very important case is overgrazing in mountains as well as in savannas being a threat an a cause of initiation of erosion by compaction of the soils	Added overgrazing to the introductory text

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	92	2934	103	3312	As stated above, it would be helpful to organise/focus information in accordance with main topics; for instance: (1) importance/dimension of overharvesting, overexploitation, and/or resource consumption by subregions/habitats; (2) current status, trends and projections by subregions; risks and opportunities, optionally (4) policy and management options.	A reorganization would be difficult at this point. It has been organized to address points 1 and 2, then risks/opportunities and policy options are dispersed throughout the section
Liliana Bravo-Monroy	92	2934	103	3312	A challenge could be unifying both parts of the section (lines 2935-3118; lines 3119-3313) by analysing/connecting/contrasting the data provided by habitat in relation to each subregion, making reference of spatial and temporal scales being examined. Despite the fact that cases are cited and localised, a synopsis of more cases and details from local perspectives would strengthen the panoramic view of each subregion.	Difficult to adapt to this suggestion given the text limitations we have
Liliana Bravo-Monroy	92	2934	103	3312	It would be also suitable providing quantitative data based on study cases in order to present measurements of impact in particular locations.	Measure of impact data for case studies not available
Bob Watson		2934			provide some quantification on section 4.4.5 overharvesting	
Diego Pacheco	92	2935	104	3313	There is the need to summarize to the main key findings for biomes, using as possible graphs, tables and maps as needed.	
Rodrigo Medellín	92	2944	92	2944	First time this emerges as a specific driver	
Co-chairs	92	2953	92	2954	Give some examples of actually exploiting species to biological extinction. Although experts do not dispute the tendency of market price to drive exploitation upward, there are strong challenges that the market pressures actually have been strong enough to drive harvests to actual extinction.	Adjusted text to reflect this
Margarita N. Lavidés	92	2956	92	2960	A concrete example of cascading effects should follow this after the author citation.	Adjusted text to reflect this
Co-chairs	92	2959	92	2960	Again the reference to extinction is going to be challenged. Frank et al did not have any cases of extinction in their work, and both the Borrvall and the Heithaus references were both theoretical predictions with no instances, and he "extinctions" were local extinction at the centre of overharvest, and not biological extinction of trophically related species. Use accurate phrasing of these major issues.	Adjusted text to reflect this
Margarita N. Lavidés	92	2960	92	2962	A concrete example of this last sentence in the paragraph should follow it.	Adjusted text to reflect this

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	92	2960	92	2962	"Displacement of native species with non-natives" seems like more of an effect on ecosystem structure, dynamics, and quality rather than an effect on the structure, dynamics, and quality of a species; consider revising with a different example.	Adjusted text to reflect this
Co-chairs	92	2966	92	2967	Again policy prescriptive language. It is within the IPBES scope and practice to say something like "and governments can deter such illegal trade by measures such as policies that strengthen enforcement, curb the demand, and expand international cooperation". But to say "and governments need to" do these things is being prescriptive about policy decisions and outside scope and practice.	Adjusted text to reflect this
Co-chairs	93	2972	93	2976	These are good examples at the community scale, but ITQs for larger scale fisheries also must be mentioned, particularly since it is often the larger scale fisheries that can do the greatest ecological harm if they overfish. ITQs have weaknesses through being exclusionary, but TURFs are equally exclusionary at the scale of the communities give rights to the area, at the exclusion of any fishers from communities not awarded a specific TURF, or whose livelihoods have always been migratory to follow target fish stocks as the stocks move. There are many cases of ITQs successfully dealing with overfishing by commercial fisheries, and these warrant mention as much as TURFs do.	Adjusted text to reflect this
Ederson A Zanetti	93	2981	93	3008	There should be a couple of paragraphs on the lack of adequate incentives for advancing sustainable management, including adequate infrastructure and institutions, markets and logistics	
Rodrigo Medellín	93	2986	93	2986	Much more straight and to the point than up above	
Marlín Pérez Suárez	93	2987	93	2987	Now must be added the illegal logging that carries out organized crime in Mexico.	
Cristobal Diaz	94	3020	95	3064	I think that we have to see too how the water resources affectations and scarcity threaten the change in biodiversity and nature's contributions to people	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	95	3049	97	3170	<p>The United States does not agree that sharks and rays are severely overfished in the Americas. Some are overfished, but others are sustainably managed. It is not useful to judge management of fisheries based on IUCN red list criteria. In North America, the aim is often to fish species at Maximum Sustainable Yield. Fishing at MSY could result in an IUCN status of vulnerable, and fishing slightly above MSY could result in an IUCN status of endangered. Therefore, stocks not considered even overfished in the United States could be considered endangered by IUCN. Therefore, the use of IUCN to describe the condition of shark species or any other species managed by the United States is not appropriate.</p> <p>Note in addition, that using IUCN status is also not appropriate for determining the status of a species under the US Endangered Species Act (ESA). Species classifications under IUCN and the ESA are not equivalent; data standards, criteria used to evaluate species, and treatment of uncertainty are also not necessarily the same. Thus, when a petition to list species under the ESA cites such classifications, the United States evaluates the source of information that the classification is based upon in light of the standards on extinction risk and the following factors: A) the present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.</p>	while the US may not consider all the shark species at risk (I agree) the statement we are making is global and have modified the text to clearly say that the america's catch of sharks and rays is contributing to this problem. In other parts of the Americas, sharks are indeed overfished and being caught as target and bycatch (e.g., panama, Ecuador, peru etc). just because the US in not in that list does not mean that the species are not threatened in the Americas/
Clifford Duke	95	3071	95	3072	Verify whether it is correct that "the number of fishers grew 220% from 425 to 950 million" This would be nearly the entire population of the Americas.	The wording has been improved
Co-chairs	95	3072	95	3074	Although the presence of some qualitative information in the Chapter is welcome, make sure the relationships are phrased correctly. For example, although 14.5 is 164% of 8.9, as reported, the consumption of fish did not rise by 164%, as the text says. The rise was 64%, not 164% Same for the growth in the number of fisheries, compared to simply the relationship between the two numbers.	The wording has been improved

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	95	3072	95	3074	The consumption data provided here does not match similar consumption data presented in Chapter 2 (compare page 95 with page 28); please reconcile these numbers.	The wording has been improved
Co-chairs	95	3080	95	3082	Much more recent data on levels of overexploited stocks is available in, for example FAO 2016, and should be used. Also the scale of the "unassessed stocks" relative to assessed stocks needs to be presented to the readers. The very large majority of large scale fisheries, with landings in the 10s of thousand soft tons and potential for large-scale ecological consequences if overharvested as included in the set of stocks that are assessed regularly by States or RFMOs. The very large majority of "unassessed stocks" are taken in small scale fisheries, where overfishing can certainly occur, but most ecological consequences are on local scales. To a naive reader, the fact that 95% of all stocks are unassessed will be read as implying 95% of all harvesting is unassessed, which is certainly not the case.	While FAO 2016 has a more recent estimation of the status of fisheries globally, this report does not include a regional breakdown of fishery stocks e.g. in the Americas. I have added language to your point about the difference between number of fisheries and catch volume.
Co-chairs	95	3087	95	3089	Again, the text will convey the wrong message to most readers not already familiar with oyster fisheries. Although it is the case that a large number of oyster beds have been lost, damage by fishing gear has been a very minor contributor to the losses. Because of the long-standing high value of oysters, harvesting gears were designed to ensure the beds remained productive, and their locations made them easy to keep protected from most fisheries for other species that used bottom-contacting gears. The losses of oyster beds are very largely habitat degradation from pollution, sedimentation, port development, etc. If there is a determination to list fishing gear as the first cause of habitat degradation, references documenting that cause as being greater than other causes is necessary.	The wording has been improved
United States Government	96	3092	96	3099	In the discussion on bycatch examples are provided for sea turtles and seabirds. Another notable bycatch example that could be included is the vaquita, a species likely to go extinct in the near future as a result of bycatch in the illegal totoaba fishery in the northern Gulf of Mexico.	Noted and completed
Rodrigo Medellín	96	3092	96	3094	Case of the vaquita <i>Phocoena sinus</i> ?	Noted and completed

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
United States Government	96	3100	96	3109	The references used regarding shark catches may be dated, as many changes have occurred since the most recent citation from 2013 (awareness toward the need to better monitor shark catches, a large increase in the number of countries that have banned shark finning and/or the sale of shark fins, etc.); please account for such changes and advancements, perhaps by using more recent citations.	Citations have been added
The Biodiversity Indicators Partnership (BIP)	96	3101	96	3103	Good use of the Red List data here to illustrate the impact of unsustainable harvest on marine biodiversity (specifically sharks, rays & chimeras)	
Thomas Brooks	96	3101	96	3103	Good use of the Red List data here to illustrate the impact of unsustainable harvest on marine biodiversity (specifically sharks, rays & chimeras)	
Co-chairs	96	3106	96	3109	Most of the measures to deter shark finning were introduced in recent years, and the 2013 reference would have been too earlier to assess whether or not the current measures are having a substantial deterrence effect. There are much more recent data from FAO, collected under the IPOA on Sharks and Rays, and they should be reported and be part of the basis for statements about the effectiveness (or lack of effectiveness) of the current measures/	Citations have been added
Co-chairs	96	3125	96	3128	This is a section on overharvesting, not recovery of endangered species. Of the 86 species, what fraction of them had overharvesting listed as a major cause of their reaching a level of Threatened or endangered, and of those, what percent continue to list directed harvesting or bycatches as a threat factor to recovery? If overharvesting is not a concern for most of them, that should be clear in the narrative.	This section/paragraph has been deleted
Co-chairs	97	3133	97	3136	If these cases are going to be listed in a section on overharvesting, then the status of the stocks of marine mammals still harvested in Canada should be reported. The harp seal, the target of the major Canadian seal fishery over the past century, is now at record high levels and listed as a threat to the recovering cod stocks. All other marine mammal hunts are subsistence hunts by Indigenous People, and are carefully regulated with a high degree of co-management. And for the sea otter, most of the historical range has been reoccupied and aside from near major harbors numbers have reached levels where sea otter are considered the single greatest threat to threatened abalone.	The wording has been improved

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	97	3141	97	3149	While this material is correct, it is not about harvesting or overharvesting. It is exactly the topic of Chapter 3, and is already well treated there. It should be removed here.	This section/parragraph has been deleted
United States Government	97	3141	97	3149	This paragraph seems out of place here, as it doesn't seem to be related to overharvesting of marine resources; consider moving.	This section/parragraph has been deleted
United States Government	97	3155	97	3157	The freshwater turtle species may be better suited in the 'Freshwater' section rather than under the 'Terrestrial' section; consider moving.	Noted and completed
Co-chairs	87	3165	97	3165	when the salmon assessments are reviewed, the evidence is strong and consistent that habiat loss due to dams, pollution and changes to adjacent lnad use were by far the dmonant causes of declines. Much of the overharvesting was secondary, as habitat degradation lead to declines in stock productivity, such that previously sustainable exploitation rates became unsupportable bby stocks in degraded habitats. Rephrase to make these relationships clearer and more cosistent with the stock assessment information.	
Co-chairs	97	3172			Interesting to see this investment in monitoring, assessments and enforcement finally mentioned in the very last phrase in the entire section. Indicates an imbalance that gives the entire section a very misleading tone compared to the record of the past two decades of harvest management in NA,	Unclear what the reviewer means. I read the section and it reads fine to me. Unless you think we need to add more on enforcement before this point, but that would make it longer and not sure it is applicable anywhere in the america's other than the US and Canada.
Liliana Bravo-Monroy	98	3174	98	3175	Box 4.10 In order to have a panoramic view, it would be also interesting to include data from Canada and Greenland (as well as other cases/countries/localities) related to: what percentage of GDP corresponds to fisheries in relation to food crops, cash crops and livestock.	Could not find these data

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	98	3174		Box 4.10	with so many books and articles written about the East Coast fisheries, it seems strange ot have the primarily refernce be a Master's Thesis on gear technology. Use more complete and current references. In addition make clear where the current state of overfished stocks is a legacy of overfishing in the 1970s and 1980s that have not yet recovered due to adverse ecosystem conditions, and where the overfishing has continued into the 2000s and the 2010's. the main IPBES focus are trends since the MEA. Moreover, there are much more recent data on bycatches than Cook 2003, such as the biannual FAO - SOFIA reports, with the most recent being 2015. Likewise there are quite comprehensive treatments of gear modificalotns hta tcna reduce bycatches in many kinds of fisheries. so the IPBES assesmwnt don't need to depend on on very local MSc thesis.IN addition, in addition to presenting cases of how large bycatches can reach, to present an up to date picture to inform policy discusisons, the box must include how many shrip and other small.mesh fisheries now have excluder devices as mandatory on all trips, how many fisheries have turtle excluder devices as mandatory, how many longline fisheries have seabird bycatch mitigation devices (tori lines, underwater deployment and recovery) as mandatory, how many require circle hooks rather than J hooks for release of shark and other bycatch, etc. 20 year old worst case scenarois do not reflect hte current state of NA overfishing	Additional references included
Virginia Meléndez Ramírez	98	3176	98	3176	Harvesting / Overharvesting, Mesoamerica complete	
United States Government	98	3188	98	3191	Consider mentioning that bycatch in this illegal fishery is considered responsible for the rapid decline of the Vaquita and its likely extinction in the near future.	Noted and completed
Rodrigo Medellín	98	3189	98	3189	Effects on vaquita Phocoena sinus!	Noted and completed
Marlín Pérez Suárez	99	3195	99	3195	Today is occurring in Mexico fo the sea cucumber	Noted and completed
Rodrigo Medellín	99	3201	99	3201	Recently (2016) rosewoods have been included in CITES	Included

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Cristobal Diaz	99	3203	100	3234	It is of great importance analyze in the Caribbean de freshwaters affectations because in the Caribbean exists great problems with water availability and the appearance of cyclical droughts that provoke big affectations in agriculture, population, and other sector of the economy. The changes in the precipitation patterns (diminished) has been demonstrated for example in Cuba and change of season: rain minus in raining season and more in the dry season.	This issue is addressed in the climate change section and not overharvesting. Communities mostly use what is captured as rainfall or have desal plants
Co-chairs	99	3212			Agard is missing from the reference list. And although some of the decline has undoubtedly related to delcies in stock sizes, some of the decline is also due to management authorities at least rying harder to regulate fisheries cathc and efforts. At least both causes should be listed, and if possible the relative importance of each should be listed.	Noted and completed
Co-chairs	99	3226	99	3228	Is anything known about the proportion of those that are over-harvested? Because they are listed in a seciton of the Chapter on overfishig, the implication will be that overfishing is widespread in these species. Something should be said explicitly about the actual proportion that are overharvested, and if that proportion is unknown, ot should be stated clearly.	The proportion is unknown, but the ornamental reef fishery is thought to drive overfishing of key species, which is noted on line 3230
Co-chairs	100	3239	100	3263	Quite a contrast to the treatment of marine species in the NA section. Why nothing on bycatches or gear effects here. If they ar enot a concern, or a concern but there ar eno data, then say so explicitly (although neither is true). But if there is informaiton, include it in boht places or neither,	Noted and completed
Co-chairs	100	3241	100	3251	A reasonably balanced presentation, but there are at least three subsequent FAO reports. FAO SOFIA 2016 list already listed in the reference list, and its figures ar ethe most current value sfor status and trends not he 2011 report.	Citations have been added
Co-chairs	100	3257	100	3263	Like the comparable paragraphs in the other subregional sectoins, the material in this paragraph is the subject matter of Chapter 3 and if any of it is not yet covred, the material shoul db e moved there.	Makes no sense to me to move it, it provides context for the discussion.
Co-chairs	100	3267	100	3268	This sentence may be true but it an introductory sentence to the section, not something uder "Freshwater".	Corrected

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	102	3309			As with other text boxes, a great deal of the contents are pretty generic and either apply to ANY subregion, no uniquely to SA, but they also have already been talked about in other SAs and the mechanisms don't need to be reexplained. Rather, more complete and robust qualitative or at least some qualitative information is needed.	Box can be moved to another section if needed
Co-chairs	103	3312		Box 4-13	Much of this is good text, but parts are far more generalized than is appropriate. For example the statement "In addition, community-based management tends to work better than top-down approaches to conservation" is not correct when the scale of operations of a pressure is larger than the scales of community governance (when power generation is a threat to habitats, when harvesting is mobile and commercial, or even when a community culture and governance processes have been weakened by factors from outside the community (migration of displaced persons, influx of capital from outside, etc. None of these make inclusive governance and management a bad idea, but they may greatly weaken its effectiveness without strong top-down support as well. Importantly, these considerations do not have to be discussed here, because the text box about the whole task of IPBES and not specifically about drivers and Chapter 4. The material here should be examined against the material on ILK and inclusive governance in Chapters 1 and 2. Is any material used here but missing in the other Chapters, it can be moved, but this box does not belong in the chapter on drivers, even though it is applicable to drivers. It is equally applicable to the subject matter of the other Chapters, and therefore is to be covered in Chapters 1 and 2.	the reviewer has a point, that not always bottom up works, unless there is a top down policy and support from the top for enforcement and incentives. My suggestion is we adjust the text to be less categorical and keep the box in here.
Virginia Meléndez Ramírez	103	3312	103	3312	Box 4.13 Explain and refer in text this box.	Can be moved to another section if needed
Liliana Bravo-Monroy	104	3314	107	3462	As suggested above, it would be helpful to organise/widen information according to main topics; for instance: (1) importance/dimension of natural events/disasters by subregions; (2) current status, trends and projections by subregions; (3) risks and opportunities, and optionally (4) policy and management options.	The organization follows the structure agreed by the authors team for all subsections. Policies are discussed in Chapter 6
Liliana Bravo-Monroy	104	3314	107	3462	Despite the fact that there are some quantitative data through the section, it would be valuable providing more data based on study cases in order to present measurements of impact in particular locations.	Unfortunately due to space limitations we could not add more study cases.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		3314			section 4.5 direct natural drivers can be shortened- most of it is irrelevant	Natural hazards is an important driver in the region (e.g. 2017 hurricane season in the Caribbean) but the section was revised.
Rafael Calderón	104	3314	105	3356	It should be clarified that natural drivers do not have the same impact as other drivers.	This is mentioned at the beginning of the next section.
Rodrigo Medellín	104	3330	104	3332	Link to climate change! (it is below, but should be mentioned here)	Climatological events are mentioned here. Anthropogenic climate change influences natural hazards but is presented in a specific driver as anthropogenic direct driver.
Bob Watson		3334		3343	This should be modified and included in the section on interactions- "Sources of risk are both natural and man-made. Ecosystem structure can ameliorate 'natural' hazards and disruptive natural events. For example, vegetative structure can alter potentially catastrophic effects of storms, floods and droughts through its storage capacity and surface resistance; coral reefs buffer waves and protect adjacent coastlines from storm damage (de Groot et al 2002). As a consequence, environmental degradation directly magnifies risk of occurrence of natural hazards, or, by destroying natural barriers, leaves human settlements and productive activities more vulnerable to their effects. For example, forests and riparian wetlands or coastal ecosystems like vegetated dunes, mangroves, coral reefs and sea-grass, reduce exposure to natural hazards by acting as natural buffers and protective barriers that, reducing the impacts of extreme natural events like landslides, tidal waves or tsunamis (Welle et al., 2012, Rodil et al., 2015). "	Natural hazards is an important driver in the region (e.g. 2017 hurricane season in the Caribbean) but the section was revised.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		3344		3351	Delete most of this text – climate change is human-induced not a natural driver – the only element to retain is a discussion on El-Nino and La Nina "Climate change is predicted to increase the frequency of high-intensity storms in selected ocean basins depending on the climate model. Almost all of the tropical cyclone damage from climate change tends to be concentrated in North America, East Asia and the Caribbean–Central American region (Mendelsohn et al., 2012). Increasing water temperatures along the Pacific coast through strong El Niño conditions and global warming might affect hurricanes there. Although rare, more subtropical cyclones have developed in the South Atlantic Ocean near Brazil. Changes in global atmospheric circulation patterns accompanying La Niña are responsible for weather extremes in parts of the world that are typically opposite to the El Niño changes."	Natural hazards is an important driver in the region (e.g. 2017 hurricane season in the Caribbean) but the section was revised.
Cristobal Diaz	104	3357	105	3399	Exists in North America analysis included information of Mesoamerica, Mexico and the Caribbean	A reference to the next section was made in the text.
Brenda McAfee	105	3387	105	3390	The Fort MacMurray fire is a good example of what may be expected under warmer and drier conditions. While the exact cause of the fire remains unknown there was consensus in the aftermath analysis that the most likely cause was human activity rather than lightning. Does this example still fit under natural drivers?	Thank you for the comment. In the case of fire it is really difficult to separate the natural and anthropogenic component in ecosystems that evolved with fire. We will add an observation.
Virginia Meléndez Ramírez	106	3400	106	3400	Direct natural drivers complete Mesoamerica e.g. Meléndez et al. 2016 about effect of the hurricane on bee diversity: http://journals.sagepub.com/doi/pdf/10.1177/194008291600900210	Thank you for the reference.
Rafael Calderón-Contreras	106	3401	106	3402	The percentages presented are not clearly specified. Are those of events? Number of deads? Economic loses?	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Rafael Calderón-Contreras	106	3407	106	3407	<p>In Mexico, during El Niño of 1998 near to 849,632 ha were affected for 14,445 fires (Delgadillo 1999). While for El Niño of 2005 were registered in Mexico 9,709 fires affected 276,089 ha (Villers & Hernández, 2007).</p> <p>Villers R.L. & Hernández L.J. 2007. Incendios forestales y el fenómeno de El Niño en México. Resúmenes de las comunicaciones de la IV Conferencia Internacional sobre incendios forestales. 13-17 mayo de 2007, Sevilla España.</p> <p>Delgadillo M.J., Aguilar O.T. & Rodríguez V.D. 1999. Los aspectos económicos y sociales de El Niño. 181-210 pp. En: Magaña Rueda V. O. (Edit.) Los Impactos de El Niño en México. Dirección de protección civil, Secretaría de Gobernación, México.</p>	Thank you for references.
Thomas Brooks	106	3412	106	3433	<p>Maybe a useful additional citation here on the role of extreme natural processes in shaping Caribbean biodiversity could be Brooks & Smith (2001) Caribbean catastrophes. Science 294: 1469–1470. DOI: 10.1126/science.1066927.</p>	Thank you for the reference.
Clifford Duke	106	3425	106	3426	<p>"regularly experience an abnormal lack of rainfall" needs clarification. If the lack of rainfall is regular, it is not abnormal.</p>	Noted. Sentence was revised
Cristobal Diaz	106	3425	106	3426	<p>Please add: "Some countries in the region, like Guyana (which had serious droughts in 1997) and Cuba severe droughts between 2004-2006 and 2015-2017, regularly experiences an abnormal lack of rainfall, especially during the dry season, that direct influence on biodiversity and ecosystem services</p>	Thank you. Sentence was revised.
United States Government	106	3429	106	3433	<p>Please make the connection to BES more clear in this paragraph.</p>	Connection was made with tourism that is an important source of revenues. Information on biodiversity was added.
Margarita N. Lavides	107	3441	107	3441	<p>Specify the nature of the soils and topography that make landslides fairly common in this areas.</p>	We added information on soils. As we are mentioning the Andes, information on topography is not necessary.
Ederson A Zanetti	110	3464	110	3610	<p>there should be a couple of paragraphs on increasing atmospheric CO2 and fertilization, with the increase on productivity at different biomes</p>	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Liliana Bravo-Monroy	107	3464	111	3610	4.6 Effects of indirect drivers on direct drivers . Section provides interesting information, although important topics need to be included e.g., drivers interconnection.	Section was revised to highlight interconnections.
Liliana Bravo-Monroy	107	3464	111	3610	In order to support capacity building across scales and topics, it would be practical to make use of the IPBES Conceptual Framework (e.g., Díaz et al. 2015) as integrative model instead of Figure 4.10. In line with this, section could describe/analyse key components and their interlinkages. From six main interlinked elements representing the natural and social systems, three are directly related to the content of Chapter 4 (anthropogenic assests; institutions and governance systems and other indirect drivers of change; direct drivers of change).	IPBES conceptual framework is used in the Introduction
Liliana Bravo-Monroy	107	3464	111	3610	Thus, it would be suggested to first complete the synthesis of literature to determine key messages & interactions of the stated three components of the model. Second, describe the three elements briefly, and then analyse what is known about the effect/response of each component and linkage. Third, a case study could be useful to apply the three components of the conceptual framework in order to gain a better understanding across scales of direct and indirect drivers of change.	This is the structure of the document - the key findings related to the different drivers, description of the main factors and them interactions. Study cases are presented in the different subsections

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Margarita N. Lavidés	107	3464	111	3609	While there are many claiming and using the term socio-ecological systems viz a vis for example effects of indirect drivers on direct drivers or also in resilience or adaptive capacity of human and ecological environments, but none has so far generated science as widely as possible to include many other relevant drivers such as power relations, cultural identities etc and many other socio-economic-politico-cultural factors. Nevertheless, one good accessible journals where IPBES Regional Assessments can refer to for papers related to these and which can enhance this section 4.6. Effects of indirect drivers on direct drivers for Americas assessment and for similar sections in other Regional Assessment, is Ecology and Society peer review multidisciplinary journal. For example, while Americas Assessment in this section discussed in detail examples of dynamics for terrestrial or forest environment and society, but again, none were discussed for marine or freshwater socio-ecological systems. Ecology and Society and similar journals can provide sources of reference for these discussion gaps. While relevant information are limited at sub-country or country scales, but nevertheless can still be useful to enhance in making the information available to policy makers	Thank you for the reference. This section was extensively revised after the Third Authors Meeting, in Cartagena
Bob Watson		3464			section 4.6- This needs a total rewrite – this must be rewritten by social scientists – most of the current text does not address the interactions	This section was revised after extensive discussions during the Third Authors meeting.
Bob Watson		3476		3479	"Reducing uncertainties through the improvement of integrated monitoring networks will enhance the capacity of response to environmental changes in the regions and improved the understanding of potential interactions of multiple drivers and scales and how the interactive effects of change drivers might impact (positively or negatively) total ecosystem effects in the future". Not relevant for this section	This section was revised.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		3481		3488	"Each driver can have different effects, some of which emerging already on the short-term (e.g., land use, deforestation), while others mainly on the long-term (e.g., climate change, changes in biogeochemical cycles). Studies indicate that different drivers of biodiversity-ecosystem function relationships occur at small plot scales (species identities, composition) and large landscape scales (biomass, species richness) as well as in short and long temporal scales. These results imply that not all relationships and findings obtained by studies at small spatial and short temporal scales can necessarily be translated to the larger or longer scales that have relevance for political decisions and conservation biology (Brose and Hillebrand, 2016)." <u>not relevant, delete</u>	This section was revised.
Co-chairs	107	3485	107	3488	This statement is true in the contrapositive as well. Some predictions from theory or generalizations at very large spatial scales may often not be the best guide to appropriate actions and measures at local spatial scales and short time frames. This two-way reasoning suggests that policies allowing flexibility and adaptation, rather than imposing some uniform and prescriptive set of measures at any scale may be optimal. However, this whole discussion is the subject matter for Chapter 6 and 5, not 4, and <u>should be moved there.</u>	Chapters 4, 5 and 6 exchanged information about their contents and overlaps where minimized.
Bob Watson		3497		3504	rewrite paragraph "However, in addition to the understanding.....and restructure communities (Isbell et al., 2013)"	This section was revised.
Bob Watson		3497		3504	paragraph "However, in addition to the understanding...and restructure communities (Isbell et al., 2013)" Not central to a section on interactions among and between drivers	This section was revised.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	108	3499	108	3503	Such generalizations are never categorically true nor false, and more importantly they are neither necessary nor helpful to policy dialogue. There is always a level of detail of interactions so fine that no model except reality can capture them all, and a level of generality that even very poorly constructed models can usually get right, as long as they are competently coded. This kind of picking away costs time and patience but provides little to robust policy making. Rework at least this sentence and probably the whole paragraph (or more) to highlight that many direct drivers can have diffuse impacts on many scales of space and time - and many indirect drivers can have effects on the expression of multiple direct drivers, and even the same direct driver at different ways on different time or space scales. The more of these that are considered in modelling, planning, and decision-making, the more robust the outcomes of the decisions can be. Those are the messages that matter, not whether any type of model categorically does a good or a poor job in all cases.	
Co-chairs	108	3506	109	3529	A fair bit of this paragraph is better placed in chapter 6, and a fair bit more is just repeating material presented in earlier parts of Chapter 4. Most of the rest should be in the part of Chapter 4 on the direct drivers, not tacked on here at the end, disconnected from the discussion about why trade as an indirect driver actually is important to BES.	Chapters 4, 5 and 6 exchanged information about their contents and overlaps where minimized.
Bob Watson		3506		3529	paragraph "Understanding and managing ecosystem-service delivery is of key ...environmental pressures in some regions across Latin America"-Most of this is not relevant for this section	Text was revised.
Co-chairs	111	3508	111	3610	Within this figure are part of an approach to an actual structured analysis of the potential linkages and feedback pathways among direct and indirect drivers. Some development of that, as was done in, for example, Chapter 5 of IPCC AR 5, WG III, might have provided insights useful to Chapters 5 and 6. But the figure is just presented here with a minimalist caption, and barely mentioned, let alone developed, in the rest of the section.	
Philip M. Fearnside	108	3514	108	3517	Need to mention indirect effects of soybeans in driving road construction with widespread impact on deforestation outside of the soy-producing areas. See: Fearnside, P.M. 2001. Soybean cultivation as a threat to the environment in Brazil. Environmental Conservation 28(1): 23-38. doi: 10.1017/S0376892901000030	Thanks for the reference. Indirect impacts are presented but not extensively due to space limitations.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Philip M. Fearnside	108	3514	108	3517	Need to mention indirect effect of soy by displacing cattle ranching from Cerrado and already deforested areas (especially in Mato Grosso) to open new ranches in more remote areas of Amazon forest (especially in Pará). See: Arima, E.Y., P. Richards, R. Walker, and M.M. Caldas. 2011. Statistical confirmation of indirect land use change in the Brazilian Amazon. <i>Environmental Research Letters</i> 6:024010. [doi: 10.1088/1748-9326/6/2/024010]. Fearnside, P.M. 2017. Deforestation of the Brazilian Amazon. In: H. Shugart (ed.) <i>Oxford Research Encyclopedia of Environmental Science</i> . Oxford University Press, New York, USA. (In press)	Thanks for the reference. Indirect impacts are presented but not extensively due to space limitations.
Philip M. Fearnside	108	3514	108	3517	In discussing commodities, need to mention the dramatic effect of exports to China, both of soy and beef. See: Fearnside, P.M., A.M.R. Figueiredo & S.C.M. Bonjour. 2013. Amazonian forest loss and the long reach of China's influence. <i>Environment, Development and Sustainability</i> 15(2): 325-338. doi: 10.1007/s10668-012-9412-2. Fearnside, P.M. & A.M.R. Figueiredo. 2016. China's influence on deforestation in Brazilian Amazonia: A growing force in the state of Mato Grosso. pp. 229-265. In: Rebecca Ray, Kevin Gallagher, Andres López & Cynthia Sanborn (eds.) <i>China and Sustainable Development in Latin America: The Social and Environmental Dimension</i> . Anthem Press, New York, USA. 367 pp.	Thanks for the reference. Indirect impacts are presented but not extensively due to space limitations.
Philip M. Fearnside	108	3514	108	3517	In discussin the effect of commodity trade, need to include not only the agricultural products mentioned but also mining. This is important not only because of the impacts of the mines themselves, but also the processing of the minerals. Aluminum is particularly damaging due to the tremendous effect of hydroelectric dams supplying electricty to aluminum smelters. See: Fearnside, P.M. 2016. Environmental and social impacts of hydroelectric dams in Brazilian Amazonia: Implications for the aluminum industry. <i>World Development</i> 77: 48-65. doi: 10.1016/j.worlddev.2015.08.015	Thanks for the reference. Indirect impacts are presented but not extensively due to space limitations.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	109	3530	109	3542	Here again an important consideration for policy making is presented in a highly judgemental way, placing some worldviews as superior to others, This paragraph has to be rewritten to make clear what the interactions are, because there is no disputing that the range of consequences flowing from the policy choices are inter-related. It is appropriate to say the full range of consequences needs to be made available to decision-makers, along with the uncertainties expected at a range of space and time scales. But categorial generalizations about how well or poorly the different links are represented is inaccurate and unfair to jurisdictions investing heavily in improving their representation in the information provided to decision-makers. And in the end it is for policy makers, and not IPBES assessors to decide how well or poorly externalities have been addressed. Experts working in global food security and famine relief may feel that the failure to provide adequate nutrition to children and mothers have ramifications of massive loss of human potential from the malnourished children, and these losses are also "poorly understood and/or poorly translated into economic costs in coming years." It is very hard to take a completely balanced view with regard to legitimacy of multiple world views and values, but that is unquestionably the foundation of IPBES. Little is accomplished by replacing a group of assessments with a bias towards economic based worldviews and under-considering biodiversity and ES values, with assessments just biased in the other direction	
Bob Watson		3530		3542	paragraph "This rapidly increasing dependency on biodiversity-risk commodities...translated into economic costs in coming years"- This is more relevant for chapter 6	Text was revised but export of commodities is a key driver of change in the region.
United States Government	109	3530	109	3530	Please define "biodiversity-risk commodities."	Clarification in the new version
Bob Watson		3544		3547	"Over time, the relative importance of the drivers will change and the effect of climate change is expected to increase, significantly (Alkemade et al., 2009). In this context, mitigation in order to stabilize the greenhouse gas concentrations in the atmosphere, and adaptation in order to adjust to changes that have already occurred or can not be avoided are both needed" nor relevant here	Climate change is becoming increasingly important as drivers, so mitigation and adaptation strategies need to be considered together and will interact with other management initiatives.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Co-chairs	109	3549	109	3551	Not sure what the message here is. Yes there is high urbanization in the Americas, but is ECA or Asia less urbanized? Is the solution to have people spread more equitably across the entire planet, so modest sized human settlements are found essentially everywhere- with transportaiton corridors between all of them? Beyond the observatoon that lots of Americans live in communnities, and communities change nature, it is hard ot see what the message is.	
Bob Watson		3549		3558	"A remarkable characteristic of the Americas is also the early and intense urbanization process. Urban land-cover change threatens biodiversity and affects ecosystem productivity through loss of habitat, biomass, and carbon storage. Even relatively small decreases in habitat can cause extinction rates to rise disproportionately in already diminished and severely fragmented habitats, like the Atlantic Forest hotspots in South America (Seto et al., 2012). Globally, all five biodiversity hotspots with the largest percentages of their land areas forecasted to become urban predominantly occupy coastal regions or are islands. In the case of the Caribbean islands, although projected urban expansion is relatively small in total area, they are home of significant proportion of endemic plants and invertebrates (Chapter 3). Urbanization rates will be highest in China and India, but it is in Central and South America where the largest number of species will be affected (Seto et al 2012). "- This does not address interactions – delete	Text was revised.
Co-chairs	109	3557	110	3587	These paragraphs just seem to be repeating the informaton presented on direct dirvers in section 4.2. There is no structured analysis of how the indirect drivers, which the title of 4.6 implied. It just seems to be restating how indirect drivers have many pathways of expression. True but already presented, With only oppportunistic illustrations without any kind of analysis, there is no incremental value to these paragraphs, or much of 4.6 so far, beyind what was already presented in 4.2 and 4.3.	
Bob Watson		3560		3563	"Atmospheric ozone occurs where emissions from fossil fuel combustion (energy utilities, industry, motor vehicle exhaust) or biomass burning interact with vapors from solvents, gasoline or vegetation. Emissions from motor vehicles and other fossil fuel combustion are also large contributors to atmospheric fine particulate matter (PM)."- Not relevant here – put text in thep pollution section	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson		3565		3572	"Food, fiber and energy production is changing global biogeochemical cycles of major nutrients (N, C, P, S). The geographic distribution of atmospheric N deposition is related to fossil fuel combustion for utilities, industry and transportation. The levels of nutrients in rivers are expected to increase in the Americas, particularly as per capita GDP, food crop and meat and milk production increase. Urban systems, via runoff and both treated and untreated sewage, add more nutrients, sediment and organic matter to aquatic systems. Widespread trends in "pesticide concentrations, some downward and some upward, occurred in response to shifts in use patterns primarily driven by regulatory changes and introductions of new pesticides. " - Redundant with earlier text, delete	
Bob Watson		3579		3587	parragraph "Major sources of atmospheric mercury...allow toxic releases to continue" - Pollution section not in this section	
Co-chairs	110	3588	111	3605	This is all policy anlysis and belongs in Chapter 6, not here.	
Bob Watson		3589		3597	"The Aichi 2020 Targets, under the Convention on Biological Diversity (CBD), aim to halt the loss of biodiversity by 2020, in order to ensure that ecosystems continue to provide essential services. Hill et al., 2015 identified many impediments for accomplishment of the Aich target and indicated that 15 of the Aichi Targets are unlikely to be delivered; 3 are likely to be delivered in part; and 2 in full. Althouhg the analysis was at the global scale, results are in accordance with drivers and pressure reported here for the Americas. The authors also considered points that may overcome the impediments as: co-production of knowledge and more equitable food systems governance; support for social change movements; an appropriate financial target for biodiversity conservation investment, with a clear means of implementation such as a currency transaction tax; and co-governance of natural resources. "- This does not address interactions	Thanks for the comment but ways to overcome these impediments are subject of Chapter 6 (Policies)
David Loreto	111	3607	111	3608	Figure 4. 10. It is suggested to remove in the figure the loss of adaptive capacity since it is redundant because if you lose resilience then there is no adaptive capacity	
Diego Pacheco	111	3607	111	3608	I suggest not using this additional framework, wich creates confussion as is additional to the IPBES conceptual framework. I suggest deleting the figure 4.10	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
DPG/Sbio/MMA	111	3607	111	3609	Figure 4. 10. needs to be revised. That is a lot of mixed up letters and symbols. All the Chapter 4 needs a revision to detect different fonts and to improve some figures to avoid these problems.	
Cristobal Diaz	111	3607	111	3609	The Figure 4.19 not can be seen with clarity, need to clean.	
David Loreto	111	3607	111	3608	Figure 4. 10. It is suggested to remove in the figure the loss of adaptive capacity since it is redundant because if you lose resilience then there is no adaptive capacity	
Rodrigo Medellín	111	3609	111	3609	And again, I don't see human population growth as a driver here	
Ederson A Zanetti	111	3611	111	3677	there should be a couple of paragraphs on increasing atmospheric co2 and fertilization, with the increase on productivity at different biomes	
Liliana Bravo-Monroy	111	3611	113	3676	4.7 Gaps in knowledge and data. Section describes a need for additional studies in particular fields. In relation to multiple drivers across scales (lines 3617-3619), there are several references that might be useful. For instance, MABES model (Kremen et al. 2007); Millenium Ecosystem Assessment framework (MEA 2005); Sustainability of social-ecological systems (Östrom 2009); Science for managing ecosystem services (Carpenter et al 2009).	
Virginia Meléndez Ramírez	111	3611	111	3611	4.7. Gaps in knowledge and data: It is suggested a list of important research topics.	
David Loreto	111	3619	111	3619	Frequently it is not possible to enhance it by the lack of local data	
Diego Pacheco	114	3678	121	3711	I do not understand the need of section 4.8 supplementary material, since introduces discussion of some case studies but there is not context at all for each of those.	
Liliana Bravo-Monroy	114	3679	120	3706	4.8 Supplementary material . Boxes 4.14 to 4.22. Those cases (or a summary of them) could strengthen the respective content of pollution and invasive alien species sections.	
Rodrigo Medellín	114	3679	114	3679	Why is this here and not with the other case studies in the corresponding section?? This is NOT supplementary material but a series of additional case studies	
Rodrigo Medellín	118	3691	118	3691	Again?	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
David Loreto	119	3699	119	3700	Box 4. 20. Regarding the statement: " However, unlike the northern hemisphere, southern Patagonian forests in particular are not resilient to beaver impacts, and therefore, they require active restoration measures to ameliorate beaver impacts (Wallem et al., 2010), it is suggested to review the statement since it seems that what is spoken is of the resistance of forests to the impacts of beavers and not of resilience said to be an integral concep	
David Loreto	119	3699	119	3700	Box 4. 20. Regarding the statement: " However, unlike the northern hemisphere, southern Patagonian forests in particular are not resilient to beaver impacts, and therefore, they require active restoration measures to ameliorate beaver impacts (Wallem et al., 2010), it is suggested to review the statement since it seems that what is spoken is of the resistance of forests to the impacts of beavers and not of resilience said to be an integral concep	
David Loreto	122	3712	122	3712	It is necessary that the references conform to the format. There are many inconsistencies	
DPG/Sbio/MMA	12	340 (Box 4.1)	12	340 (Box 4.1)	Instead of "...(including indigenous and local knowledge systems and...", we suggest "...(including indigenous and local communities tradicional knowledge (TK) systems and..." in harmony with the Convention on Biological Diversity (see art. 8j) and Nagoya Protocol.	Text was revised.
Co-chairs	11	340 (text box)		line 6 of box	Saying these are "exogenous" is saying that humans are not part of ecosystems. That goes against a great deal of thinking and research, especially post-Ostrom. Moreover a major goal of IPBES is reconnect humans better to their environment. This needs to be expressed differently.	Noted. Text comes from the IPBES documents.
Marcelo Cabido	32	4.4.1. Habita t Deg	49	1516	The length devoted to this driver is excesive in comparison to the others. Also, it is not absolutely clear why the treatment of this driver is discriminated in biomes within the Americas and a different crietria is followed with the other drives. I accept that land degradation is a crucial driver but the space devoted to it seems rather unbalanced. I believe that instead of some detailed events occurring in certain geographic sites, a more synthetic perspective is needed at this point. For example, the information presented in Table 4.13, besides it is relevant for the Krah̃ o people, is too detailed when trying to present a general perspective of the use and effect of fire in the whole Americas	This comment could be addressed by adding a synthetic figure, reducing the length of this section, and by explaining that we have an obligation to communicate ILK

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
DPG/Sbio/MMA	16	460 (Box 4.2)	16	460 (Box 4.2)	Instead of "Indigenous and local knowledge (ILK)", we suggest "indigenous and local communities traditional knowledge (TK)" in harmony with the Convention on Biological Diversity (see art. 8j) and Nagoya Protocol.	
DPG/Sbio/MMA	16	460 (Box 4.2)	16	460 (Box 4.2)	Box 4.2 is focused on indigenous peoples and their traditional knowledge. Although local and traditional communities contribute as much for the conservation of biodiversity and environment in general. In Brazil there are groups such as caçaras, quilombolas, ribeirinhos, faxinalenses, quebradeiras de coco babaçu and extractivists. Their lifestyles, traditional knowledge and practices are examples of the sustainable use of biological diversity. Apparently the reference 2 (Ecuador) in Box 4.2 does not refer to indigenous people, but to a community with traditional knowledge about fisheries and shrimp farms management. We recommend this to be double checked and should be a reference in the first paragraph of this box on the contribution of other groups whose traditional way of life are of great <u>relevance for the conservation of biodiversity.</u>	
Marcelo Cabido	12	Box 4.1	12	Box 4.1	It is not absolutely clear to me the link between Anthropogenic Assets and direct/indirect drivers in the Figure. Perhaps an arrow lacking?	Figure was revised
Marcelo Cabido	16	Box 4.1	16	Box 4.1	The examples included in Box 4.1 are fine but perhaps they need further reference in the main text	
Brenda McAfee	16	Box 4.2	16	Box 4.2	Bullet 3. Is the statement regarding high oil prices forcing a new oil exploratory boom still relevant as oil prices are currently at an all time low?	
Marcelo Cabido	37	Box 4.3	37	Box 4.3	Instead of presenting a general account, I suggest to go deeper into a single example but showing the mechanisms underlying the restoration process and, especially, the results.	These boxes don't seem to satisfy reviewers, who want more details for these examples or many more examples. I moved them down from the overview section to the sections organized by region, which will hopefully help address these <u>comments</u>
United States Government	48	Box 4.5			"decimated" is often accompanied by a negative connotation; consider "lost" instead.	The word was changed as suggested.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Marcelo Cabido	4.4.3	Climate Change	4.4.3	Climate Change	Perhaps a reference to the indirect effect of Climate Change on fisheries through the alteration of the ENSO dynamic could be included.	
Marcelo Cabido	11	Fig. 4.1	11	Fig.4.1	There is almost no explanation of the Fig. in the text. It seems like the content of the Fig. will be displayed in following pages, but the reader is left to his own interpretation. The reference to Box 4.1 (page 12) is also diffuse.	Text was revised.
Marcelo Cabido	19	Fig. 4.2	19	Fig. 4.2	I don't think the Fig. is necessary. However, if the authors believe it is, should be further referred to in the text	
Marcelo Cabido	31	Fig. 4.2	31	Fig. 4.2	What does the Y axis mean?	
Marcelo Cabido	68	Fig. 4.9	49	Fig. 4.9	The legend to the figure needs further explanation, especially for a reader that is not fully acquainted with levels of biological diversity, biological processes and climate change effects.	Noted and completed
Marcelo Cabido	Indirect Drivers	General Comment			In general terms, the drivers considered are OK, but I believe their effect on biodiversity and NBPs are not always explicitly presented. Perhaps a little more of focus on processes and mechanisms would be acknowledge. Very few concerning governance and indicators.	
Marcelo Cabido	several	several	several	several	The concepts of direct and indirect drivers are repeated several times.	
Co-chairs	28	table 4.10			There needs to be better documentation for the narrative in the cells. For example, there are many cases illustrating that high population growth rate and low per capita consumption (usually poverty) can place great pressure on biodiversity. Likewise as is documented in Chapter 2 and indirectly in 3, there are examples of countries with low growth rate and high per capita consumption are using the wealth reflected in the high consumption to reduce pressure on biodiversity. It is not <i>necessarily</i> the case that the upper left placed high pressure on biodiversity and the lower right puts low pressure in biodiversity. It may be the case, but it may not be. The table is misleading and probably should be deleted if it can't be fully documented or else <u>greatly qualified in the narrative</u>	
Marcelo Cabido	31	Table 4.11	31	Table 4.11	Please, explain what the last column means	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Marcelo Cabido	33	Table 4.12	33	Table 4.12	The table provides a very detailed information for a specific country, but does not allow to get a general picture for the Americas	Given the many issues raised with this table, and the need to cut text, I deleted it.
Marcelo Cabido	71	Table 4.15	71	Table 4.15	Since the effect of climate change is ot expected to be even around the world, perhaps it would be worth mentioning the degree of certainty of each event in each analytical unit	We cannot do this here for reasons of space
Marcelo Cabido	21	Table 4.4	21	Table 4.4	Perhaps this table is not necessary; but if it will stay in the manuscript, it needs a legend with further information in order to be self explanatory	
Marcelo Cabido	22	Table 4.5	22	Table 4.5	The table presents a nice synthesis but I believe that the interactions among the indicators considered are not addressed	
Co-chairs	22	table 4.5			Again this tells only the negative aspects of international trade and finance. A balanced chapter would also have columns listing the potential opportunities presented by the factors in each row, and at least most of such cells would not be empty. Moreover, either here or in chapter 6 this table would have to have the policy instruments available to States to manage these <i>potential</i> risks.	
Marcelo Cabido	27	Table 4.9	27	Table 4.9	The column including area (km2) data, does it refer to millions of km2?	
Carlos Alfredo Joly	General				The chapter clearly needs restructuring, and better balance between indirect and direct drivers, as well as their interaction. What also reflects in the key findings and the SPM. The whole chapter is too long and must be shortened to 80/85 pages at maximum. The must be a better connection both with chapter 3, and with 5 and 6.	
Carlos Alfredo Joly	General				There is far to many speculations without solid data behind it, or supported by references. Specifically applies to the indirect drivers section. Statements/conclusions not evidence-based	
Carlos Alfredo Joly	General				Lack of data on trends of indirect drivers, such as governance, population growth, economic growth, human development, trade and finance, and technological development	
Diego Pacheco	General				General comments: There is the need to summarize this chapter. It is too long. The references to the subregiones can be captured in one single section and not distributed along the text. There is the need for the some lenght between direct and indirect drivers.	Chapter was revised in order to make it shorter.
Harald Pauli	General				references are missing resp. do not fit to the citations	Reference list was revised.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Marcelo Cabido	General				KEY FINDINGS - Some of the statements are obvious and perhaps not too attractive for people out of the scientific community.	Key findings were revised
Marcelo Cabido	General				KEY FINDINGS - There are almost no reference to direct and indirect drivers, even not mention of drivers (as such) at all.	Key findings were revised
Marcelo Cabido	General				KEY FINDINGS - References to Aichi targets and SDC seem rather forced. No explicit reference is found with respect to values, indicators and capacity building.	Key findings were revised
Marcelo Cabido	General				There is an imbalance between indirect and direct drivers. I suggest a better balance and perhaps a further development of the interrelationship between both.	Key findings were revised
Marlín Pérez Suárez					Table 4.6 and Table 4.7 What happens with Brazil and Mexico?? There is no mention of this, in previous chapters these countries use them as can examples	
Marlín Pérez Suárez					Table 4.9 What happens with South America? There is no mention of this	
Marlín Pérez Suárez					Box 4.3 To mention which regions have benefited from the restoration programs, and in what percentage have they been restored. In the case of Mexico, temperate forest is one of the most threatened ecosystems and in turn most of the reforestation programs are focused on this type of vegetation	These boxes don't seem to satisfy reviewers, who want more details for these examples or many more examples. I moved them down from the overview section to the sections organized by region, which will hopefully help address these comments
Marlín Pérez Suárez					Figures 4.1 and 4.10 are not well appreciated	Noted. Figures lost format when converted to PDF.
Marlín Pérez Suárez					Figure 4.2 Improve resolution	Noted. Figures lost format when converted to PDF.
Marlín Pérez Suárez					Throughout the chapter in its various sections there is no homogenization in the examples or case studies. For example, there is no comment on what is happening in Mexico or in another Central American country (restoration programs, fire management, which in this case it is important to mention the traditional management of "roza-tumba-quema" in tropical areas, among others examples). In the same way, they go unnoticed the Caribbean and Central America countries (the cases of tobacco, coffee, sugar cane, etc.)	Due to space limitations, we could not cover examples for all the subregions and countries.

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Tom Christensen	98		98		Box text. Newer information and publications on greenland fisheries (and other use of living resources) are available at the Greenland Institute of Natural resource web page (www.natur.gl). Reviewer can be helpfull in identifying relevant material	Tried to find better data on the site but will need reviewers assistance if this box is going to be updated
Bob Watson	General				<p>The structure of the direct drivers section could be simplified. In the current structure, there is a discussion of each of the direct drivers, which is then followed by the implications of that individual driver on each of the various major ecosystems within each of the sub-regions (North America, Mesoamerica, Caribbean and South America). This makes the chapter very repetitive and intellectually less than ideal. Some of the text is also repetitive with text in Chapter 3, particularly section 3.2. My rational for the following structure is quite simple. The various ecosystems and their NCP within each sub-region are affected by the ensemble of indirect and direct drivers and not by each direct driver individually.</p> <p>I suggest the following:</p> <p>Indirect drivers (historic and projected with quantification, with sub-regional specificity) – 15 types pages</p> <p>Direct drivers (historic and projected with quantification, with sub-regional specificity) – 15 typed pages</p> <p>The interplay between and among indirect and direct drivers – 10 typed pages</p> <p>The implications of the ensemble of drivers on different ecosystems and their NCP (material, non-material and regulating) for each sub-region, identifying the most important:</p> <p>North America – 10 typed pages</p> <p>Mesoamerica – 10 typed pages</p> <p>Caribbean – 10 typed pages</p> <p>South America – 10 typed pages</p> <p>A comparison of the similarities and differences across the sub-regions – 5 pages</p>	
Bob Watson	General				I strongly encourage the chapter 4 CLAs and LAs to collaborate with the Chapter 3 CLAs and LAs and eliminate redundant text. This would allow new material on indirect drivers and the interaction among and between drivers to be included and stay within the agreed page lengths.	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson	General				The current length of the sections is unbalanced. I suggest increasing the length of the indirect drivers section, primarily by adding some quantitative tables on historic and projected trends, and increasing the amount of text that discusses the interplay between and among the direct and indirect drivers. The direct drivers section can be shortened, primarily by restructuring as suggested in comment 1 and eliminating text that is redundant with chapter 3.	Section on Indirect Drivers was revised.
Bob Watson	General				The current text primarily focusses qualitatively on historic trends, whereas the chapter should focusses both on historic and projected trends and be more quantitative.	
Bob Watson	General				There is a significant discussion on inequality but it is disconnected to the issues of IPBES, i.e., biodiversity and NCP. Unless the inequality text is directly linked to biodiversity and NCP it should be deleted.	We don't agree. Inequality is related to pressures on Biodiversity and NCPs as evidences provided in the text.
Bob Watson	General				Much of the text reads as a review and not as a critical assessment of the evidence – statements such as "the economist Martin Khor discusses" (line 714), According to Ford et al., (line 913) are not appropriate for an assessment. This chapter should be critically assessing the literature, not reviewing the literature.	
Bob Watson	General				Many of the paragraphs are too long and convoluted – e.g., in several cases the length of the bolded and unbolded text in the key findings is too long. Each key message should be short and punchy – short bold text supported by 2-3 sentences of unbolded text. Also, many of the paragraphs in the main text have multiple disconnected issues in the same paragraph – keep each paragraph focused on one issue.	

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson					Suggestion 1 KF: Increasing human demand for food, water and energy have resulted in a loss of biodiversity and degradation of many of nature's non-material and regulating contributions to people (NCP) (well established). Growing pressures on natural resources reflect high per capita consumption of natural resources, and growing dependency on commodities exports and other conditions.	All key findings were revised after discussions held during the last authors meeting
Bob Watson					suggestion 2 KF: Economic growth and population growth together are the main drivers of resource consumption. Resource consumption increased significantly since 1960 due to a 5-fold increase in the economy and a 2.5-fold increase in population.	All key findings were revised after discussions held during the last authors meeting
Bob Watson					suggestion 3 KF: Economic growth can positively or negatively impact biodiversity and NCP, but currently, on balance, it adversely impacts biodiversity and NCP when environmental and social development goals are insufficiently accounted for (well established). In the Americas, positive impacts of economic growth may include social and environmental investments such as biodiversity protection, greater environmental awareness and changes in values. Negative impacts of economic growth include unsustainably expansive conversion, use and exploitation of terrestrial, freshwater and marine ecosystems and resources, threatening biodiversity and degrading NCP by reducing species abundances and disrupting key ecosystem functions. (4.6)	All key findings were revised after discussions held during the last authors meeting
Bob Watson					suggestion 4KF: Increased economic globalization has catalyzed rapid growth of international trade, and become an important driver for regional development, but has disconnected places of production, transformation and consumption of land-based and marine-based products. The Americas generates around 17.6% of world exports, of which about 70% of this is from North America. The LAC contribution to world exports (5.2%), is dominated (i.e., about 50%) by exports of oil, minerals and agricultural products (well established) (4.3.3). The decoupling of production and consumption challenges socio-environmental governance and regulatory implementation beyond the intrinsic difficulties of governing sectors rapidly changing. Because of this complexity and pace of change, natural resource use policies often come into place only after fundamental shifts in the land-use system are already underway and interventions become costly and have limited influence (4.6).	All key findings were revised after discussions held during the last authors meeting

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson					Suggestion 5KF: Rapid urbanization is a key driver of loss of biodiversity and NCP, but the nature and the magnitude of the impacts vary substantially among sub-regions of the Americas (Established but incomplete). Although urban population impacts depend on consumption patterns and lifestyles, which vary considerably from one sub-region to another, (4.3.5), a large number of species will be affected throughout the Americas. While conservation of biodiversity and NCP are low priorities in urban planning in most of the Americas, many urban and peri-urban areas contain residual biodiversity representative of the natural landscape.	All key findings were revised after discussions held during the last authors meeting
Bob Watson					suggestion 6KF: Values differ among cultural and ethnic groups across the whole region and shape governance systems, in particular ways of addressing development policies, land tenure and indigenous rights, and strongly influence decisions on land use and natural resources exploitation in the different subregions Governance systems, which are shaped by the differing values held by different cultural and ethnic groups, strongly influence decisions on land use and the exploitation of natural resources (well-established). Indigenous peoples throughout the Americas have developed many different socio-economic systems (nationally and locally). Indigenous and local knowledge (ILK) are expressions of social capital that can positively influence biodiversity and ecosystem services. While cases of conservation of biodiversity and nature contributions to people related to empowerment of indigenous and traditional communities are emerging in the region (for example, the role of indigenous land on deforestation control in tropical forests of South America) weak and less participatory governance systems are associated with cases of conflicts in managing land and natural resources in all of the Americas subregions (for example, conflicts related to infrastructure building in indigenous lands) (4.3.1, 4.3.6).	All key findings were revised after discussions held during the last authors meeting

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson					<p>Suggested KF 7: Habitat conversion, fragmentation and overexploitation are resulting in a loss of biodiversity and a loss of NCP in all ecosystems. Habitat degradation due to land conversion and agricultural intensification; wetland drainage and conversion; new infrastructure (coastal development, construction of roads, dams, pipelines, and transmission lines; increasing density of impervious surfaces), and resource extraction is the largest threat to fresh water, marine and terrestrial biodiversity and NCP in the Americas (well-established). The expansion and intensification of agriculture, including livestock grazing, in the Americas is decreasing the area and altering natural ecosystems (well-established) (4.4.1). Related changes include shifting drainage patterns (increased infiltration and runoff), water quality degradation, soil disturbance, habitat loss, and release of chemicals that can be toxic to biota and human populations. Nitrogen and phosphorus fertilizer use, and planting legumes such as soybeans, have greatly contributed to increases in the amount of available N and P in the environment, with negative consequences for ecosystem function, and air, soil and water quality (4.4.2), including major contributions to coastal and freshwater oxygen depletion. Land-use changes, road and trail construction, waterways and domestic animals are common dispersal routes for invasive species (well-established) (4.4.4). Habitat conversion also decreases connectivity among, and diversity within, remaining fragments of natural ecosystems (well-established). Wildlife, fisheries, and people, including many indigenous peoples, are exposed to residual pollution in the environment.. Mining for trace metal ores and coal has left lasting legacies of toxic pollution across the region (4.4.2) (well-established). The resulting changes in terrestrial, freshwater and marine environments are interrelated and they change biogeochemical cycles, pollute ecosystems, and promote overexploitation and biological invasions. Although unsustainable management of natural resources are threatening biodiversity and degrading</p>	All key findings were revised after discussions held during the last authors meeting

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson					<p>Suggested KF 8: Fossil fuel combustion is the pollutant driver that impacts the most ecosystems in the Americas, has the clearest negative effects on human quality of life via air pollution, and is the major driver of ocean acidification and contributes to deoxygenation which are both increasing (4.4.2) (well-established) (. Air pollution increases human infant mortality, including, for example, increasing the odds of sudden infant death syndrome by 25% in some studies; increases the incidence of low human birth weights and adult morbidity and mortality; and disperses toxics that affect human nervous systems or are carcinogenic. the combustion of fossil fuels account for 25% of the direct anthropogenic mercury emissions that are increasing the mercury burden of polar and subpolar wildlife and indigenous people with diets dominated by fish, eggs of fish-eating birds, or marine mammals, affecting wildlife reproduction and infant nervous systems. Although most air pollution has declined in North America, some types of pollution have begun to increase again due to long-range transport of fossil-fuel related pollution from Asia. There are not enough data to assess these trends in the rest of the Americas. Ocean acidification from increased atmospheric CO2 is increasing and is already dissolving major components of the Pacific Ocean food web off the US West Coast and contributing to a Caribbean-wide flattening of coral reefs and, if current trends continue, will collapse the Southern Ocean food web, degrading its commercial fisheries and starving its wildlife, and will harm a major Atlantic Ocean fishery. Ocean temperatures have become warmer, and are in part responsible for increasing ocean deoxygenation. Marine plastic pollution is also increasing, and both are expected to contribute to stresses on the marine food web from increasing acidification and potentially overexploitation. In 2010, from land-based sources alone, five to 13 million metric tons of plastic pollution entered the ocean. Fossil fuel combustion also contributes to human-caused atmospheric N deposition. being</p>	All key findings were revised after discussions held during the last authors meeting

Reviewer Name	From Page	From Line	Till Page	Till Line	Comment	Author Annotations
Bob Watson					<p>suggested KF9: Human-induced climate change is affecting ecosystems throughout the America's due to changes in temperature and precipitation, including the frequency and intensity of extreme events. Tropical forests (dry and humid) and wetlands in South and Central America are experiencing more frequent temperature and precipitation extremes. Also glaciers of Andean and Western North American mountains are retreating due to a warming trend. Important tropical Andes ecosystems, such as páramos, punas, and evergreen montane forests, and North American alpine and subalpine systems, as well as arctic and boreal systems, are projected to undergo a large amount of species turnover or loss of species richness. Caribbean ecosystems and Eastern North America may be particularly vulnerable to rising sea levels and more severe or frequent hurricanes, which are expected to increase in frequency as a result of climate change. Drylands of North America and MesoAmerica are experiencing hotter and drier conditions (well established), and these are expected to continue into the foreseeable future (established but incomplete). Environmental degradation is one of the major factors contributing to the increasing vulnerability of socio-ecological systems to natural hazards. Climate change is increasingly important in the Americas not only due to changes in temperature, precipitation and frequency of extreme events in the region but also through the interaction with ecosystem functions and other drivers such as invasive species, land degradation, fire frequency, ocean acidification, and natural hazards. Many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, migration patterns, abundances, and species interactions in response to climate change. Environmental degradation and climate increases risk of occurrence of natural hazards, or, by destroying natural barriers, leaves human settlements and productive activities more vulnerable to their effects with significant costs. Globally, the Americas was</p>	All key findings were revised after discussions held during the last authors meeting

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Bob Watson					Suggested KF10: Although most ecosystems in the America's continue to be degraded, an increase in conservation and ecological restoration is having positive effects, although costs can be significant and the full reversal of the adverse impacts of human activities is rarely possible (well established) Evidence from different subregions indicates that structure and functionality of ecosystems recover faster than species richness (particularly in species-rich biomes). Non-material contributions may not be restored for some people. Strategies that combine sound management, protected areas and ecological restoration at landscape level improve biodiversity conservation and maintenance of NCPs (4.4.1). In spite of the pressures of drivers of change on	Key findings were revised in the final version of the document.
Bob Watson					"(Box 4. 14, Supplementary material). " - If the Box is important place in text not supplementary material	Due to space limitations, most of the boxes were inserted in Supplementary material but this is not affecting the content of the main text.
Sofía Treviño Heres	83	2565	83	2569	The text explains that only the US and Canada have good records on IAS and that most countries in the Americas have poor records on non-native species and more limited data on IAS. The source of this information is almost 10 years old, and not wuite accurate. Mexico has a good record of IAS and has even created the Information System on Invasive Species of Mexico to gather and increase the existing available information reported on IAS, including those that have been identified as a high risk for Mexican biodiversity, helping the identification of main routes of invasion and the creation of fact sheets of species and the systematization of the information for prevention, detection, control and erradication of IAS. (http://www.biodiversidad.gob.mx/invasoras) Mexico has also developed a National Strategy on Invasive Species for the prevention, control and erradication, which was presented in 2010 including goals to 2020 and expected results (http://www.biodiversidad.gob.mx/especies/Invasoras/estrategia.html & http://www.biodiversidad.gob.mx/pais/pdf/Estrategia_Invasoras_Mex.pdf).	